



## System i and System p PCI adapters









System i and System p  
PCI adapters

**Note**

Before using this information and the product it supports, read the information in “Notices” on page 415 and the *IBM Systems Safety Information* manual, G229-9054.

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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.

### World Trade safety information

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.

### Laser safety information

IBM® System i® models and System p® 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 System i models and IBM System p 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>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/environment/products/prp.shtml>.



EU Only

**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.



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:



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

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.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

For California: Perchlorate Material - special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://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 may include a lithium manganese dioxide battery which contains a perchlorate substance.

### **IBM Cryptographic Coprocessor Card Return Program**

The following information applies only for systems originally sold prior to July 1, 2006:

This machine may contain an optional feature, the cryptographic coprocessor card, which includes a polyurethane material that contains mercury. Please follow local ordinances or regulations for disposal of this card. IBM has established a return program for certain IBM Cryptographic Coprocessor Cards. More information can be found at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

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## About this topic

This topic contains procedures and reference information that you or your service provider can use to place, install or remove Peripheral Component Interconnect (PCI) or PCI-X features, including PCI adapters, PCI adapter cassettes, and PCI adapter dividers.


For information about the accessibility features of this product, for users who have a physical disability, see “Accessibility features,” on page 413.



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## PCI adapters

You might need to place, install or remove Peripheral Component Interconnect (PCI) or PCI-X features on POWER5 systems. Use the procedures in this section to perform these tasks.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

### Important:


- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

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## Model 7047-185 or 7037-A50 PCI adapters

You might need to remove, replace, or install PCI adapters. Use the procedures in this section to perform these tasks.

This system does not support the removal, replacement, or installation of adapters with the system power on.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

## Prepare to remove or install model 7047-185 or 7037-A50 PCI adapters with the system power off

If you are installing a new adapter, determine the slot in which to place the PCI adapter. If you are replacing a failed adapter, you can use the light path diagnostics LED next to the each PCI slot to identify the failed adapter.

For placement information, refer to “Model 7047-185 (IntelliStation® POWER 185 ) and 7037-A50 (p5 185) adapter placement” on page 214. To learn more about light path diagnostics, see “Identify a failing part on a model 7047-185 or 7037-A50” on page 338.

Follow these steps to get to the PCI slots:

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.

**Note:** Leave the power cord connected if you need to identify a failed adapter using the light path diagnostics.

2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. “Stop the system or logical partition” on page 399.
4. If you are servicing a rack-mounted system, do the following steps:
  - a. Open the front rack door.
  - b. Place the system in the service position. See “Place the rack-mounted model 7047-185 or 7037-A50 in the service position” on page 341.
  - c. Remove the side cover. See “Remove and replace the model 7047-185 or 7037-A50 side cover” on page 347. (A rack server’s top cover has the same removal procedure as a tower server’s side cover.)
5. If you are servicing a stand-alone system, remove the service access cover. See “Remove and replace model 7047-185 or 7037-A50 covers and doors” on page 344.
6. Choose one the following options:
  - a. If you are removing an existing adapter, go to “Remove model 7047-185 or 7037-A50 PCI adapters with the system power off.”
  - b. If you are installing a new adapter, go to “Install model 7047-185 or 7037-A50 PCI adapters with the system power off” on page 3.

## **Remove model 7047-185 or 7037-A50 PCI adapters with the system power off**

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

The following procedure describes how to remove PCI or PCI-X adapters with the system power off.

1. If you have not already done so, follow the steps in “Prepare to remove or install model 7047-185 or 7037-A50 PCI adapters with the system power off” on page 1.
2. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter. The light path diagnostics LEDs can be used to identify a failed adapter. A lit LED next to a PCI slot indicates the adapter in that slot has failed. The system does not need to be powered on to use light path diagnostics, however, the system must be connected to a power source.
3. Record the slot number and location of each adapter being removed. The adapter slots are numbered on the rear of the system.
4. Lift the adapter retention bracket **A** as shown in the following figure.
5. If you are removing a long adapter, retract the long adapter retention bracket **B** by pushing in on the blue buttons. Retract the bracket so that it clears the tail end of long adapters.

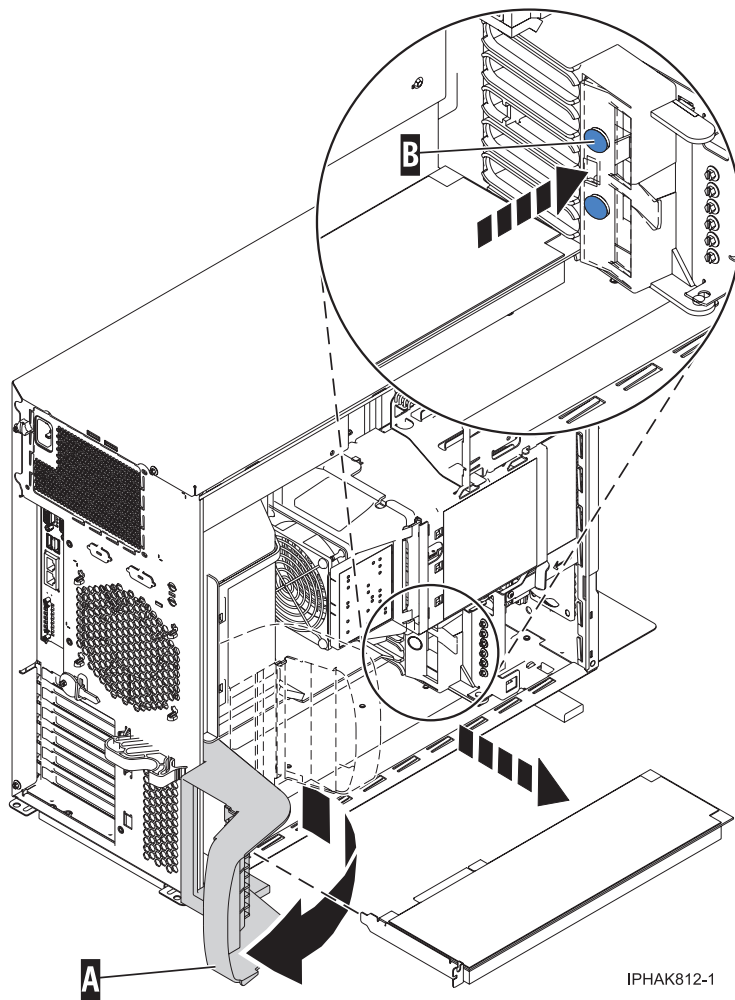


Figure 1. Removing an adapter

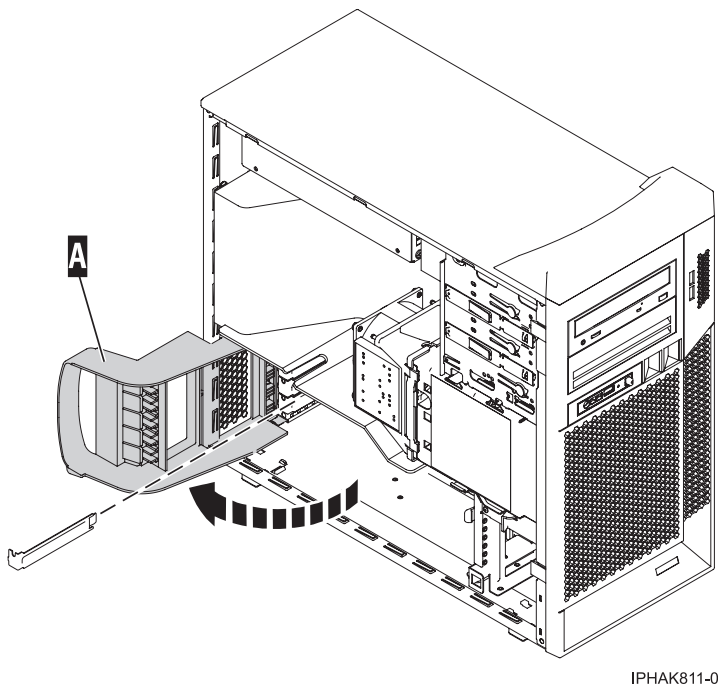
6. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system.
7. Choose one of the following options:
  - a. To install another adapter into the empty slot, go to step 3 on page 4 in “Install model 7047-185 or 7037-A50 PCI adapters with the system power off.”
  - b. If you do not plan to install another adapter, go to “Complete the installation or removal of model 7047-185 or 7037-A50 PCI adapters with the system power off” on page 5.

## Install model 7047-185 or 7037-A50 PCI adapters with the system power off

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

The following procedures describe how to install PCI or PCI-X adapters with the system power off.

1. If you have not already done so, follow the steps in “Prepare to remove or install model 7047-185 or 7037-A50 PCI adapters with the system power off” on page 1.
2. Lift the adapter retention bracket **A** as shown in the following figure.



IPHAK811-0

*Figure 2. Lift the adapter retention bracket*

3. Ensure the slot is empty. Remove the adapter filler plate if one is present.
  4. If you are installing a long adapter, retract the long adapter retention bracket by pushing in on the blue buttons on the bracket. This bracket is pictured in Figure 1 on page 3. Retract the bracket so that it clears the tail end of long adapters.
  5. Remove the new adapter from the antistatic package.
- Attention:** Avoid touching the components and gold-edge connectors on the adapter.
6. Place the adapter, component-side up, on a flat, antistatic surface.
  7. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
  8. Press the adapter firmly into its connector. Be sure that it is completely and correctly seated in its connector.
  9. If you are installing a long adapter, release the long adapter retention bracket using latch **B** as shown in the following figure. This bracket secures the tail end of long adapters.
  10. Lower the adapter retention bracket **A** as shown in the following figure. First, release the adapter retention bracket from the chassis **C**.



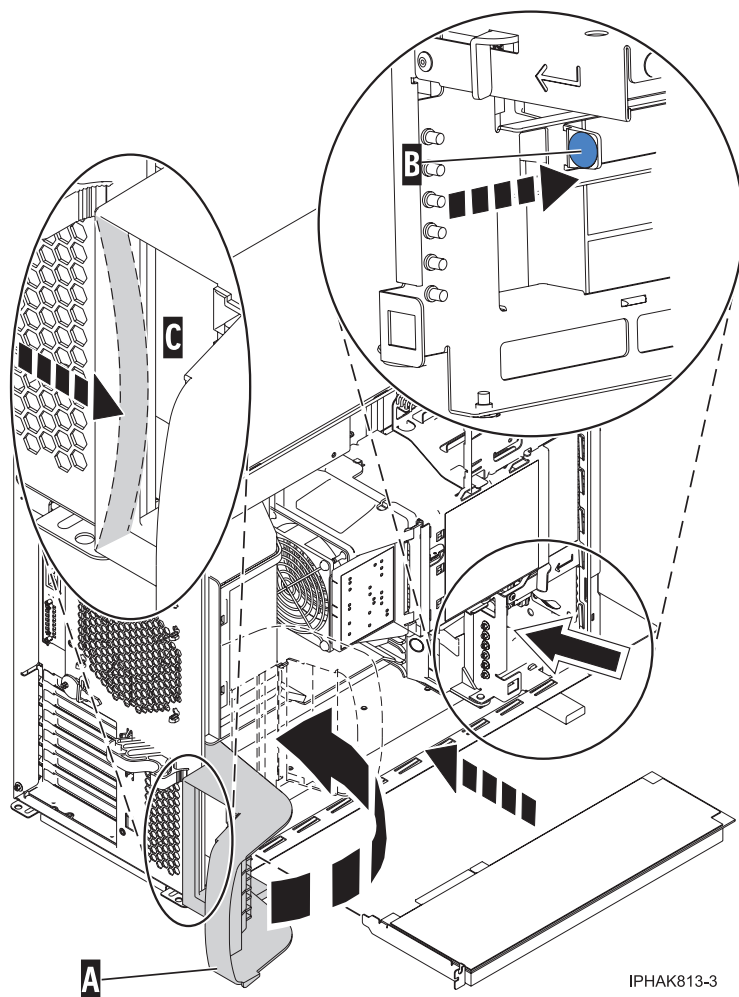


Figure 3. Installing the adapter

11. Go to “Complete the installation or removal of model 7047-185 or 7037-A50 PCI adapters with the system power off.”

### Complete the installation or removal of model 7047-185 or 7037-A50 PCI adapters with the system power off

To complete the installation or removal of a PCI or PCI-X adapters, use the following steps.


1. If you have not already done so, lower the adapter retention bracket back into the system.
2. Connect any adapter cables.
3. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
4. Replace or close the covers. See “Remove and replace model 7047-185 or 7037-A50 covers and doors” on page 344.
5. On a rack-mounted system, place the system in the operating positions and close the rear rack door. See “Place the rack-mounted model 7047-185 or 7037-A50 in the operating position” on page 340.
6. Reconnect the power source to the system.
7. “Start the system or logical partition” on page 398.
8. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

---

## Model 505 PCI adapters

You might need to remove, replace, or install PCI adapters. Use the procedures in this section to perform these tasks.

This system does not support the installation of PCI adapters with the system power on.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

## Install model 505 PCI adapters

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

### Install model 505 PCI adapters with the system power off

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

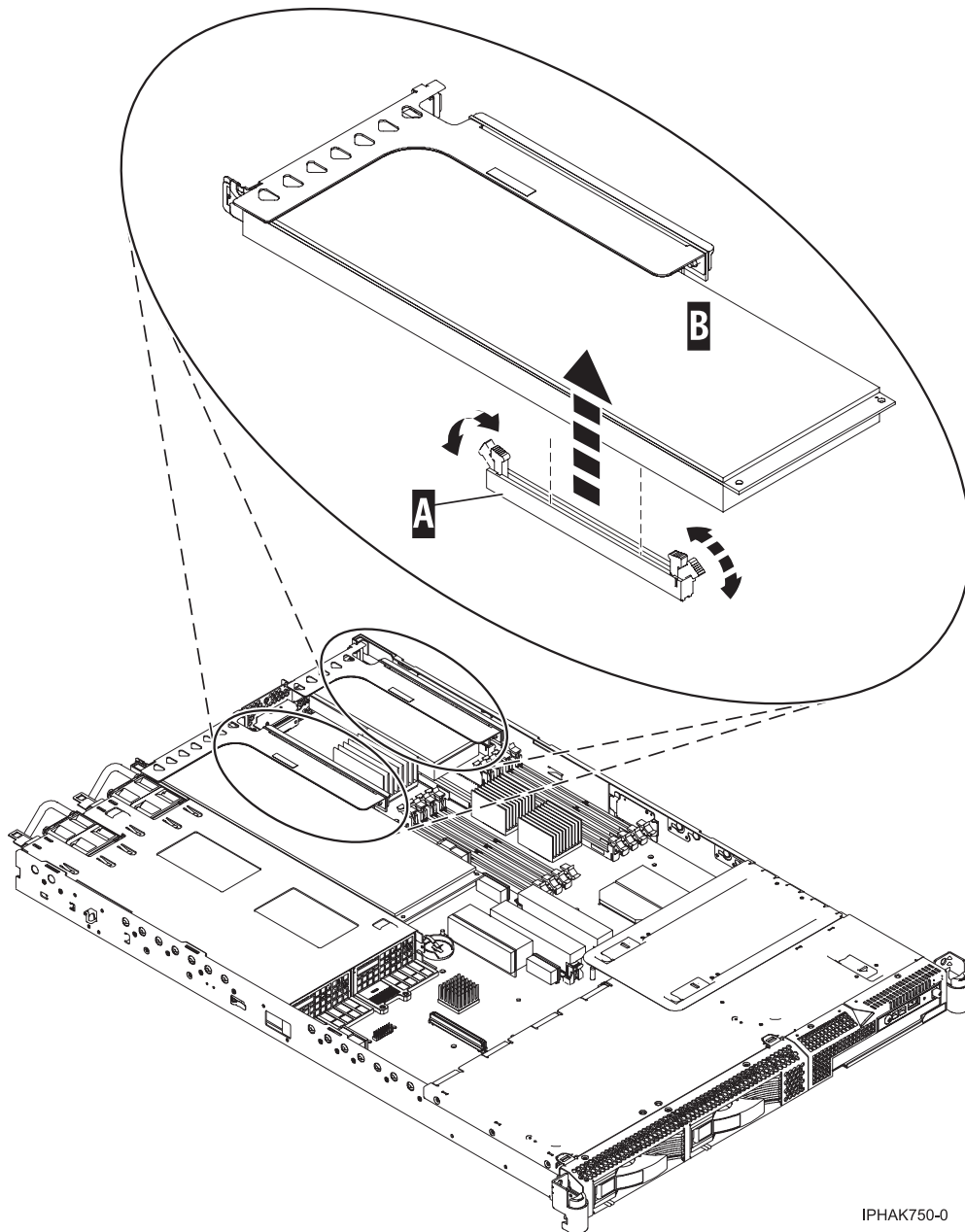
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

1. Determine if there are any slot restrictions. See “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. Stop the system. See “Stop the system or logical partition” on page 399.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. Disconnect the power source from the system by unplugging the system.

#### **DANGER**

<p><b>This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.</b></p>
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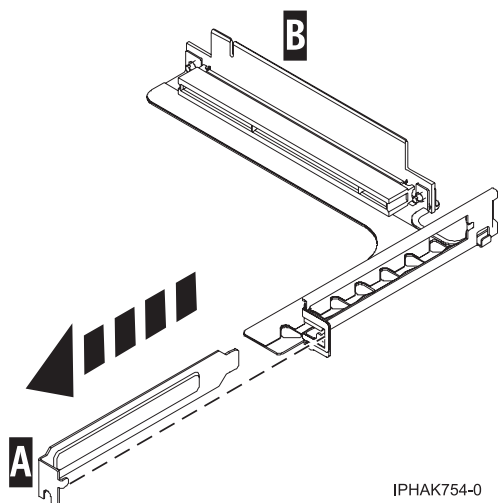
6. Place the system in the service position. See “Place the model 505 in the service position” on page 352.
7. Remove the service access cover. See “Remove the service access cover from the rack-mounted model 505” on page 360.
8. Take precautions to protect the adapters you will handle from static electricity. See “Handling static-sensitive devices” on page 327.
9. Locate the PCI adapter riser card.
10. Remove the PCI adapter riser card by doing the following:
  - a. Push the riser card connector tabs **A** out and then down, as shown in the following figure.
  - b. Pull the riser card **B** out of the connector.



IPHAK750-0

*Figure 4. PCI adapter riser card removed from the system unit*

11. Ensure the riser card is ready to receive the adapter by removing any filler panels present adapters, or the slot shield from the adapter connector of the riser card.



IPHAK754-0

Figure 5. PCI adapter slot shield removed

12. If necessary, remove the adapter to be installed from the antistatic package.

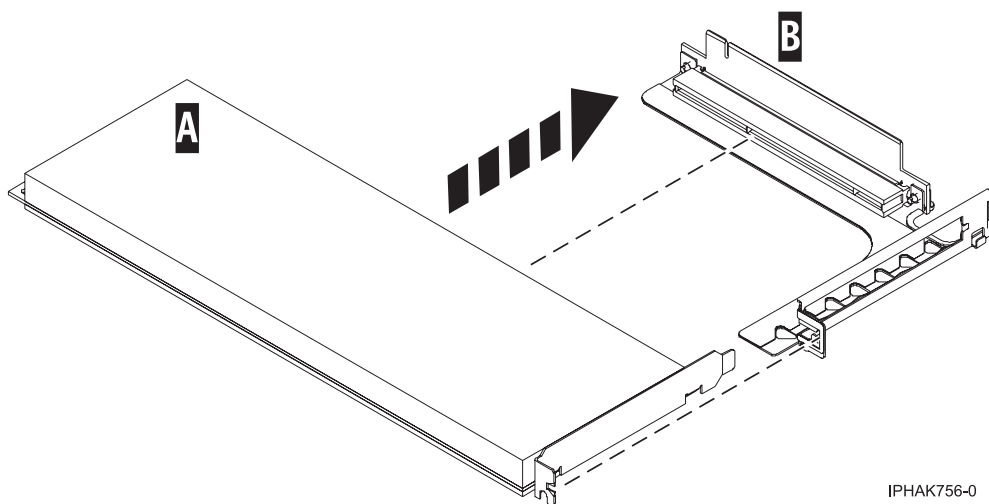
**Attention:** Avoid touching the components and gold-edge connectors on the adapter.

13. Place the adapter, component-side up, on a flat, antistatic surface.

**Note:** Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type, remove the blue handle or support bracket from the adapter.

14. Press the adapter into its connector on the riser card.

**Attention:** When you install an adapter into the riser card, be sure that it is completely and correctly seated in its connector.

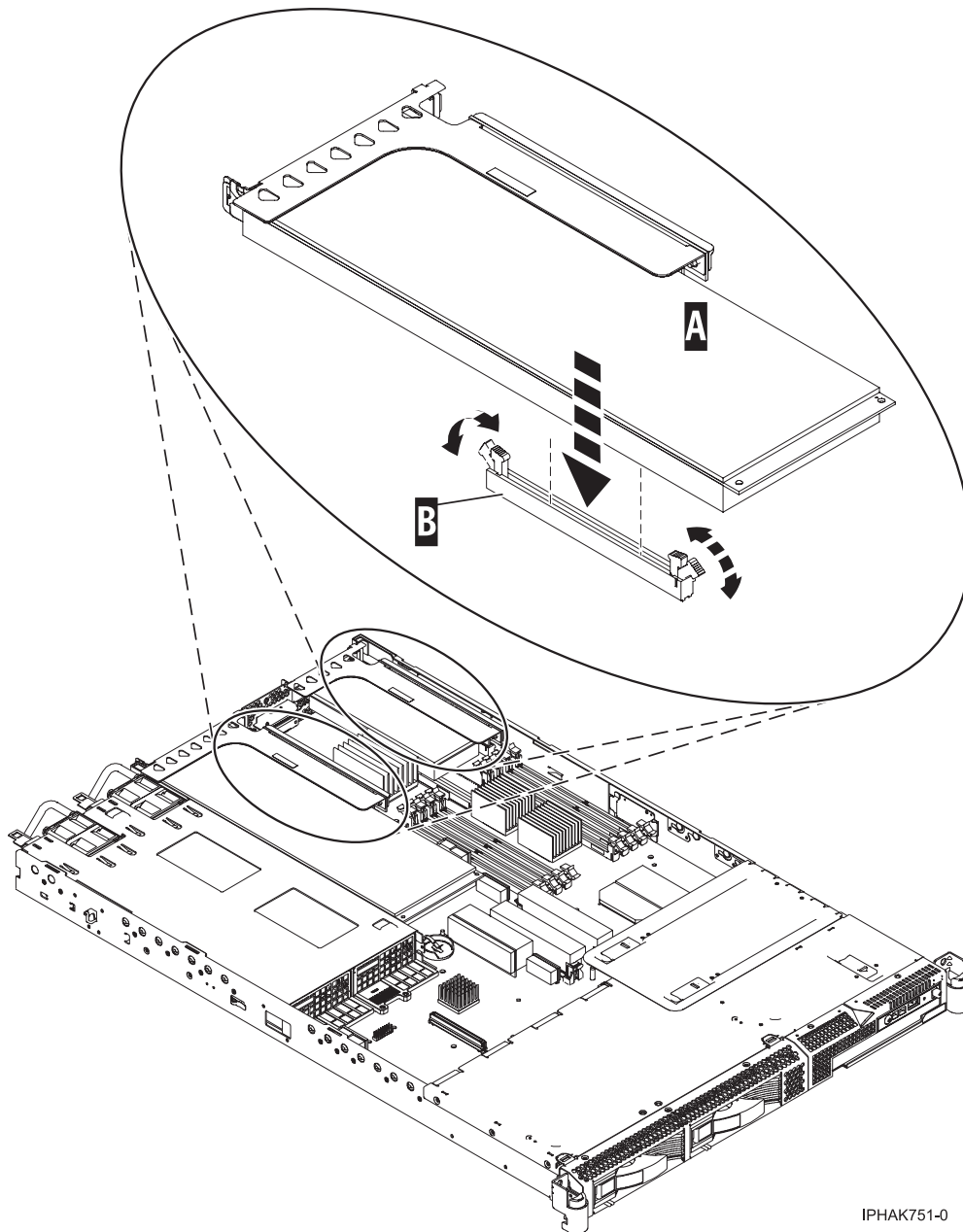


IPHAK756-0

Figure 6. PCI adapter placed into the riser card

15. To install the adapter in the adapter slot, do the following:
  - a. Ensure that the connector tabs are pushed out to the unlocked position A before installing the PCI adapter riser card as shown in the following figure.
  - b. Carefully grasp the riser card, with the adapter, along two edges and align it with the connector.

- c. Insert the riser card **A** into the connector. Secure the riser card by pushing in the connector tabs **B**.



IPHA751-0

*Figure 7. PCI adapter riser card placed into the system unit*

16. Connect any adapter cables.
17. Route the cables through the cable-management arm.
18. Replace the service access cover. See “Install the service access cover on the rack-mounted model 505” on page 368.
19. Place the system in the operating position. See “Place the model 505 in the operating position” on page 356.
20. Reconnect the power source to the system.
21. Close the rack door.
22. Start the system. See “Start the system or logical partition” on page 398.

23. Verify that the new resource is functional. See “Verify the installed part” on page 404.

## Remove model 505 PCI adapters

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

### Remove model 505 PCI adapters with the system power off

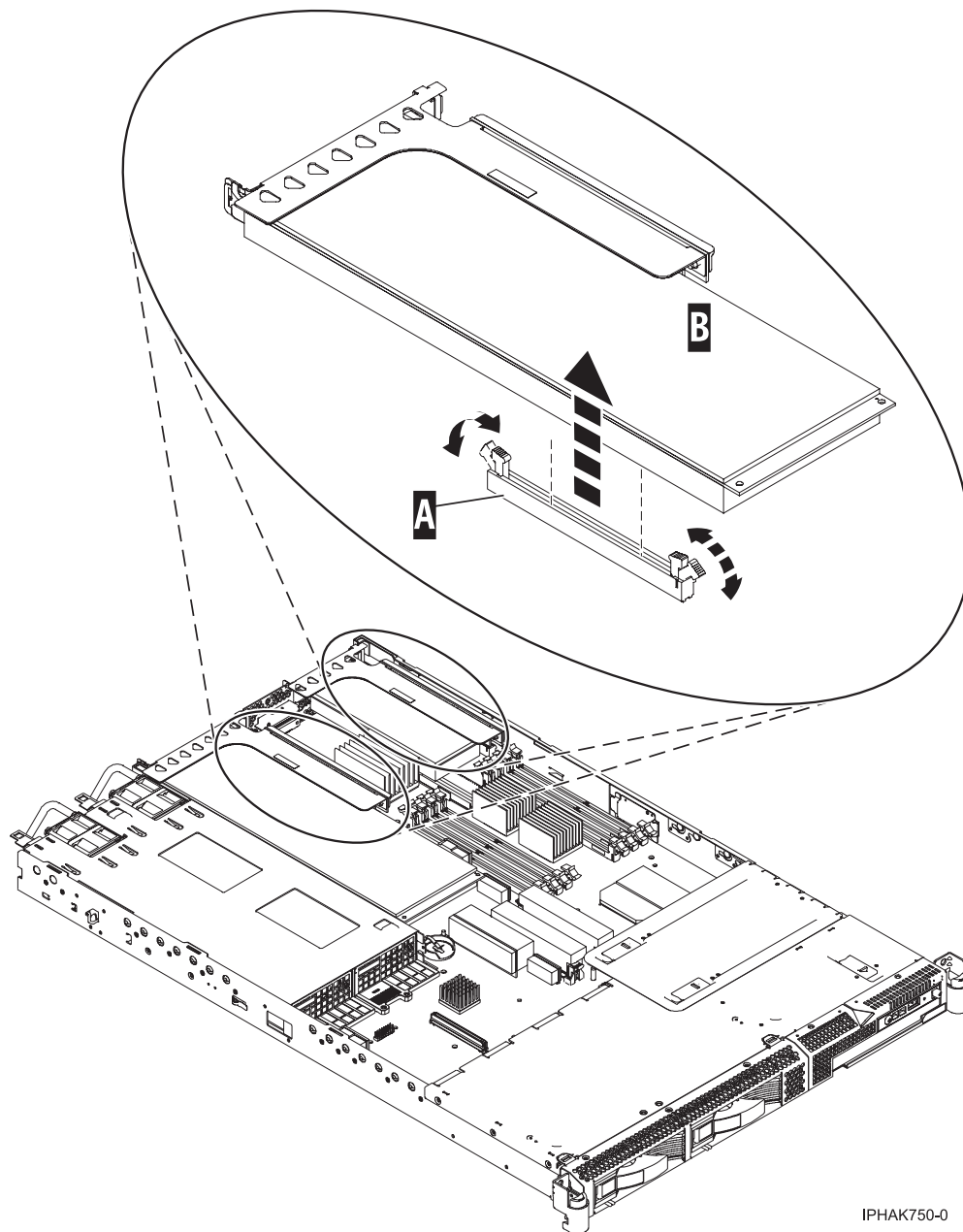
You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter. Before handling any PCI adapter, see “Handling static-sensitive devices” on page 327.
3. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system.
4. Stop the system. See “Stop the system or logical partition” on page 399.
5. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
6. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

7. Open the front rack door.
8. Place the system in the service position. See “Place the model 505 in the service position” on page 352.
9. Remove the service access cover. See “Remove the service access cover from the rack-mounted model 505” on page 360.
10. Locate the PCI adapter riser card.
11. Remove the PCI adapter riser card by doing the following:
  - a. Push the riser card connector tabs **A** out and then down, as shown in the following figure.
  - b. Pull the riser card **B** out of the connector.



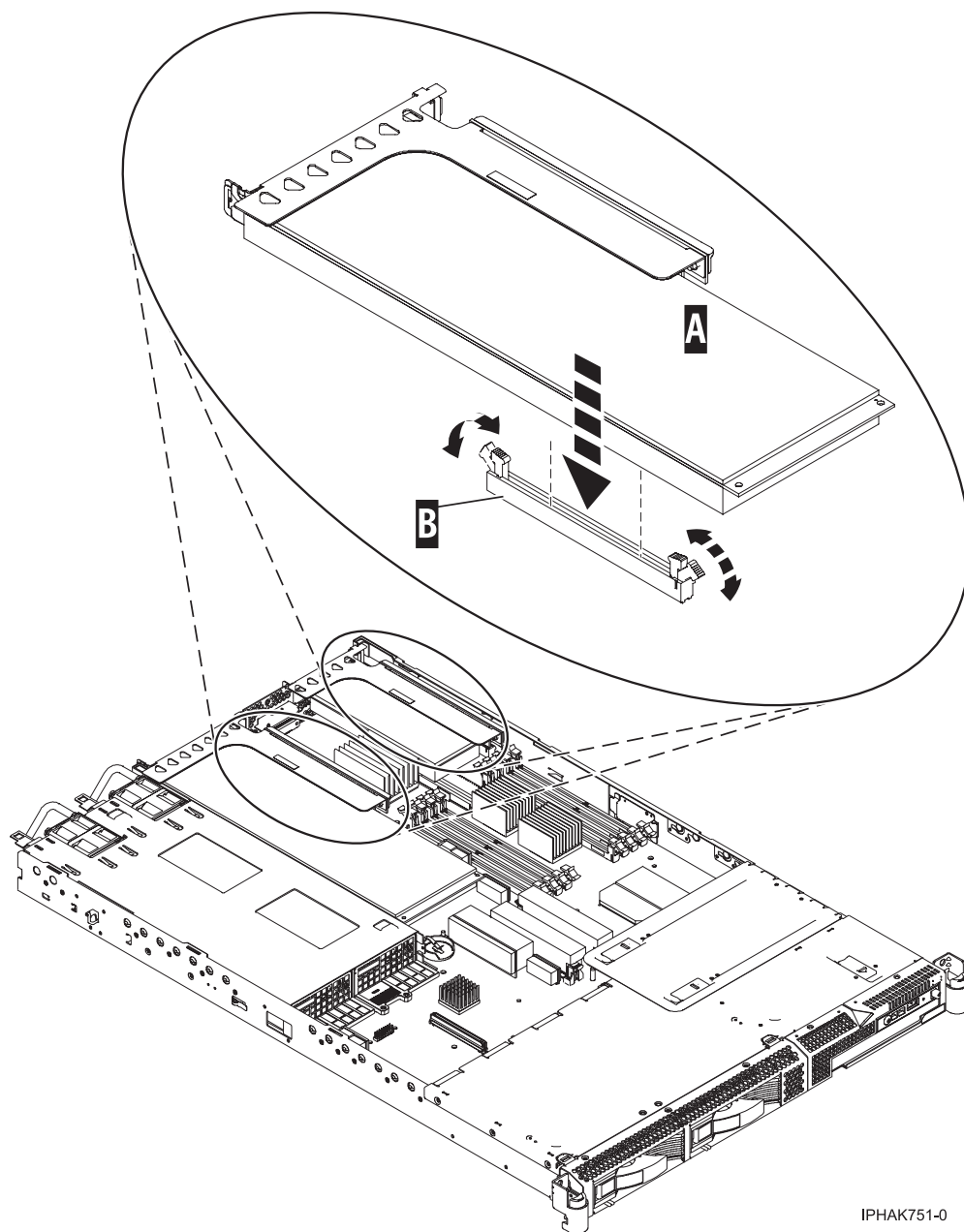
IPHAK750-0

*Figure 8. PCI adapter riser card removed from the system unit*

12. Remove the adapter from the riser card and place it on a flat, antistatic surface.







IPHAK751-0

Figure 10. PCI adapter riser card placed into the system unit (shown with adapter in place)

17. Replace the cover. See "Install the service access cover on the rack-mounted model 505" on page 368.
18. Place the system in the operating position. See "Place the model 505 in the operating position" on page 356.
19. Reconnect the power source to the system.
20. Close the rack door.
21. Start the system. See "Start the system or logical partition" on page 398.
22. Verify that the new resource is functional. See "Verify the installed part" on page 404.

## Replace a model 505 PCI adapter

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

To replace PCI or PCI-X adapters, use the following procedures.

### Replace model 505 PCI adapters with the system power off

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

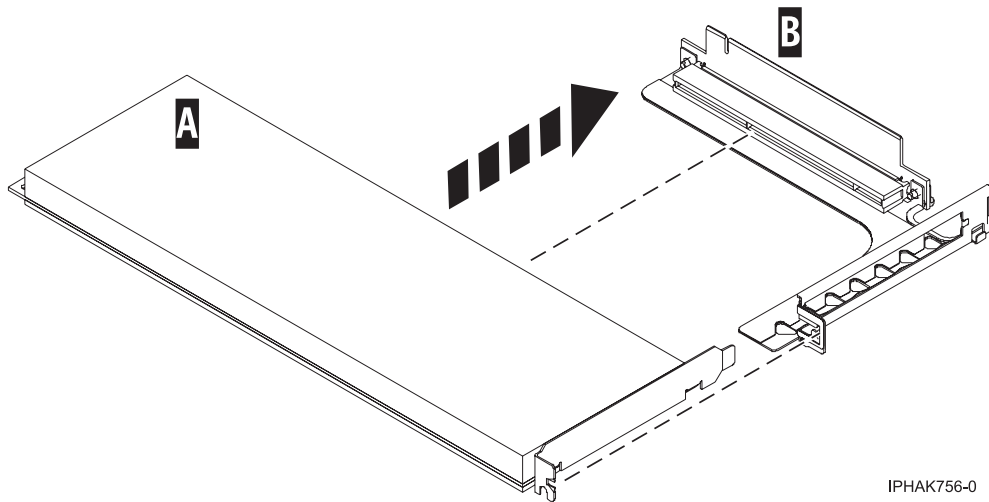
You must have already completed the procedure “Remove model 505 PCI adapters with the system power off” on page 10.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

To replace a PCI adapter with the system power off, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. If necessary, remove the adapter to be installed from the antistatic package.
3. Place the adapter, component-side up, on a flat, antistatic surface. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
4. Press the adapter into its connector on the riser card.

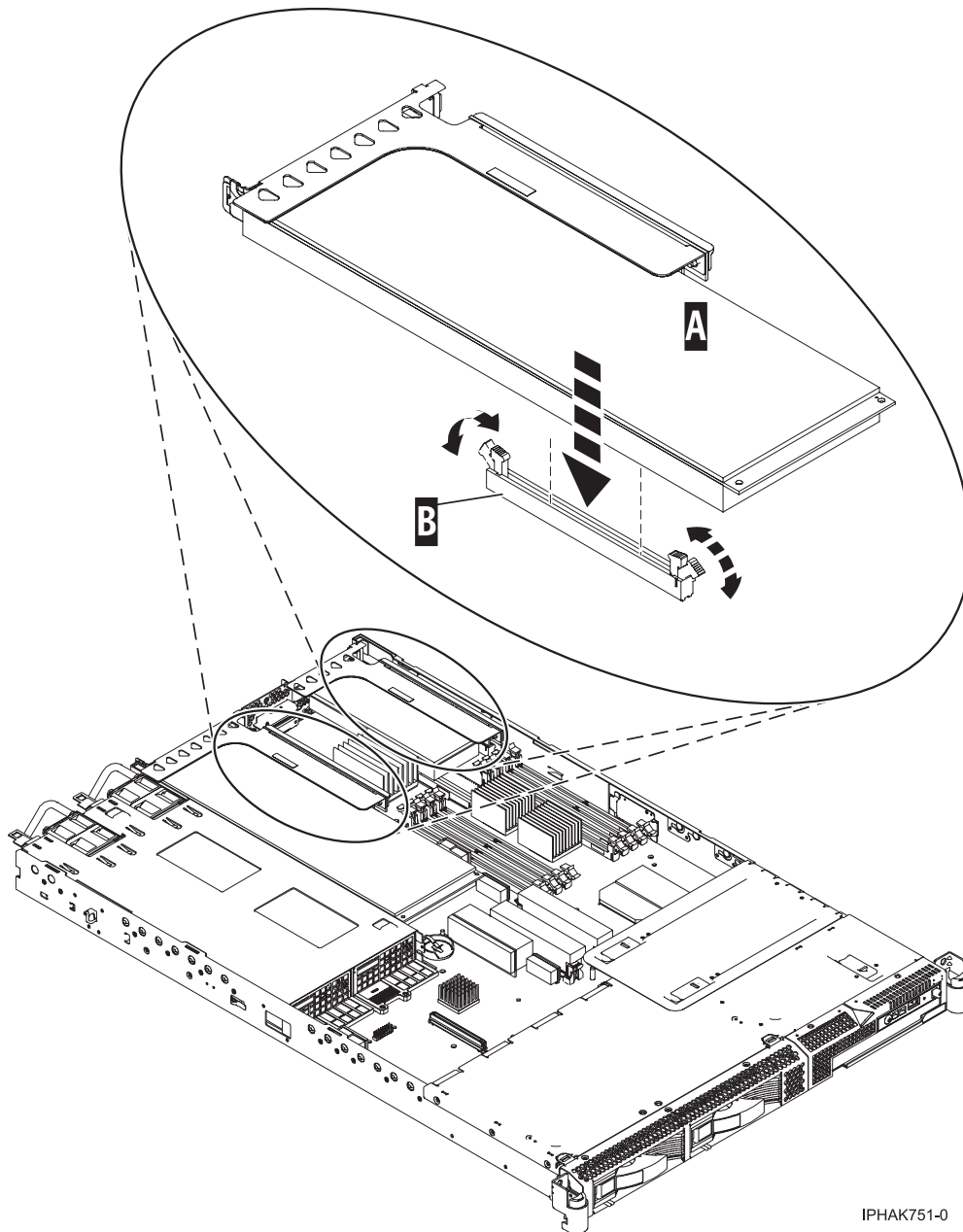
**Attention:** When you install an adapter into the riser card, be sure that it is completely and correctly seated in its connector.



IPHAK756-0

Figure 11. PCI adapter placed into the riser card

5. To install the adapter in the adapter slot, do the following:
  - a. Ensure that the connector tabs are pushed out to the unlocked position A before installing the PCI adapter riser card as shown in the following figure.
  - b. Carefully grasp the riser card, with the adapter, along two edges and align it with the connector.
  - c. Insert the riser card A into the connector. Secure the riser card by pushing in the connector tabs B.



IPHAK751-0

Figure 12. PCI adapter riser card placed into the system unit

6. Connect the adapter cables.
7. Route the cables through the cable-management arm.
8. Replace the cover. See "Install the service access cover on the rack-mounted model 505" on page 368.
9. Place the system in the operating position. See "Place the model 505 in the operating position" on page 356.
10. Reconnect the power source to the system.
11. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
12. Close the rack door.
13. Start the system. See "Start the system or logical partition" on page 398.


14. Verify that the new resource is functional. See “Verify the installed part” on page 404.

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## Model 285, 515, 52x, or attached expansion-unit, PCI adapters

You might need to remove, replace, or install PCI adapters. Use the procedures in this section to perform these tasks.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the

IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To remove, replace, or install PCI or PCI-X adapters, use the following procedures.

## Install model 285, 515, 52x, or attached expansion-unit, PCI adapters

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

### Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in AIX

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, see Partitioning for AIX® to learn more about working in partitions, then return here to continue the procedure.

To install a PCI adapter with the system power on in AIX, do the following:

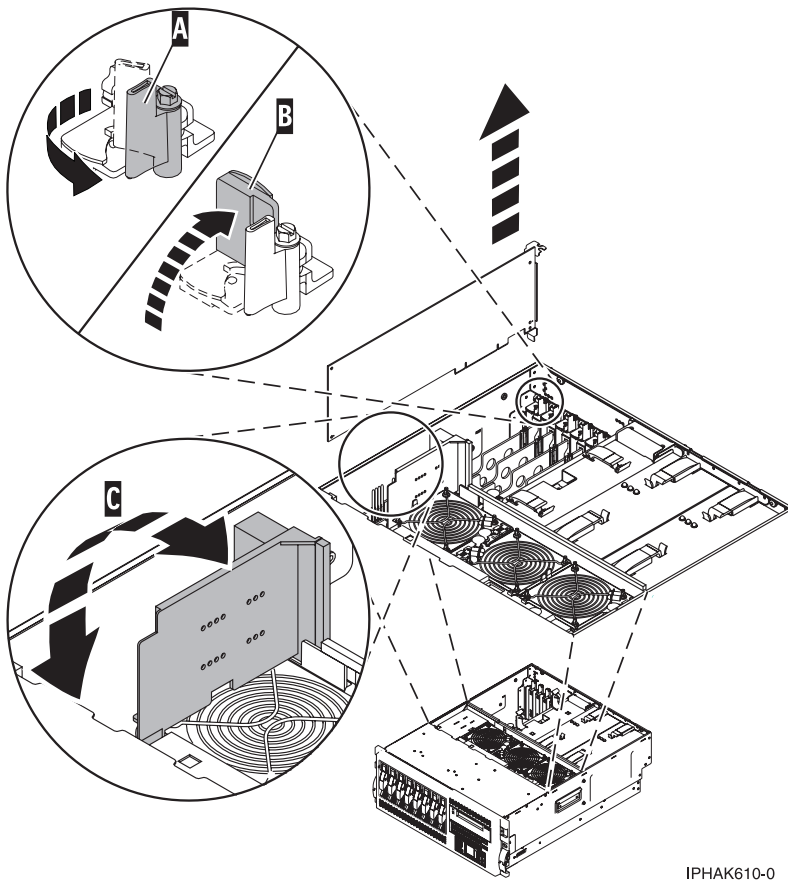
1. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.

- If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
  - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
  3. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
  4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to step 5.
    - If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
    - Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
    - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
      - a. Open the front rack door.
      - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
      - c. Remove or open the service access cover as follows:
        - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
        - “Open the model 0595, 5095, or D20 service access cover” on page 392.
    - For all other rack-mounted expansion units, follow these steps:
      - a. Open the back rack door.
      - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
        - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
        - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
        - “Open the model 0595, 5095, or D20 service access cover” on page 392.
  5. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
    - “Remove the back door and cover from the 5095 expansion unit” on page 388.
  6. If necessary, remove the adapter expansion slot shield.
  7. If necessary, remove the adapter from the antistatic package.

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

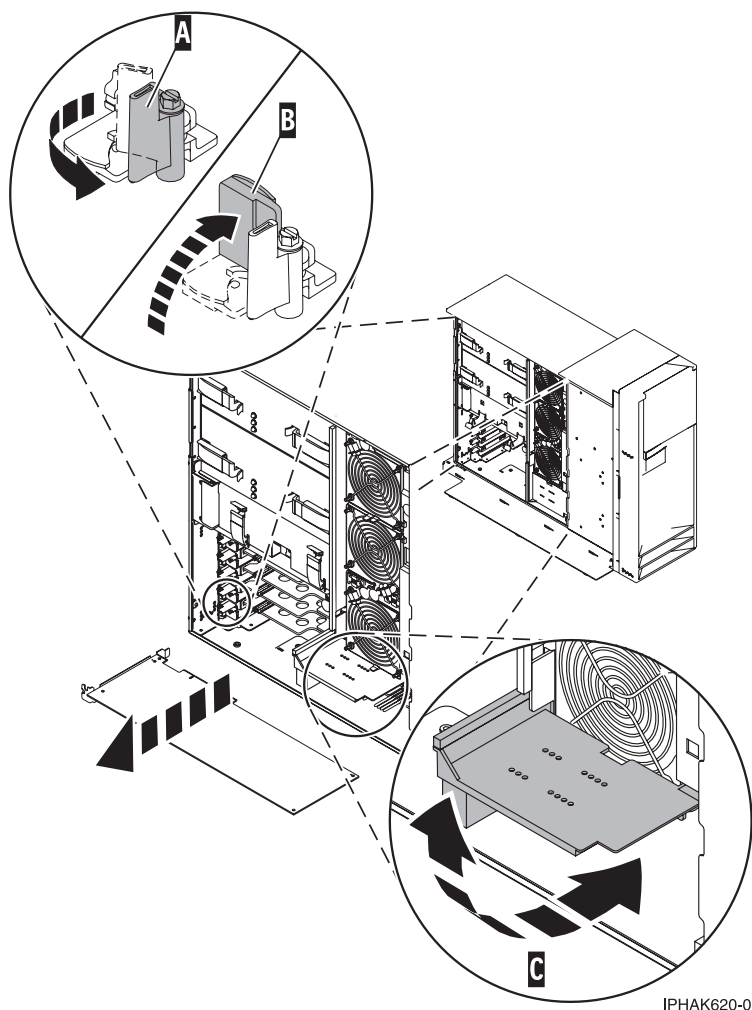
8. Place the adapter, component-side up, on a flat, antistatic surface.
9. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
10. Refer to “PCI hot-plug manager access for AIX” on page 327, and follow the steps in the procedure to select **PCI Hot Plug Manager**. Then return here to continue.

11. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
12. Select the appropriate empty PCI slot from the ones that are listed, and press Enter.
13. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 13 or Figure 14 on page 19.
14. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
15. If you are installing a short adapter, continue to the next step. If you are installing a long adapter, do the following:
  - a. Unlatch and open the PCI adapter light-pipe plate **C** that is attached to the fan tray as shown in figure Figure 13 or Figure 14 on page 19.
  - b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
16. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instruction in "Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters" on page 39 and then return here.



IPHAK610-0

Figure 13. Model 52x PCI adapter or filler plate removed from the rack-mounted system unit



IPHAK620-0

Figure 14. Model 52x PCI adapter or filler plate removed from the stand-alone system unit

17. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See "Component LEDs" on page 329.
18. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
19. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

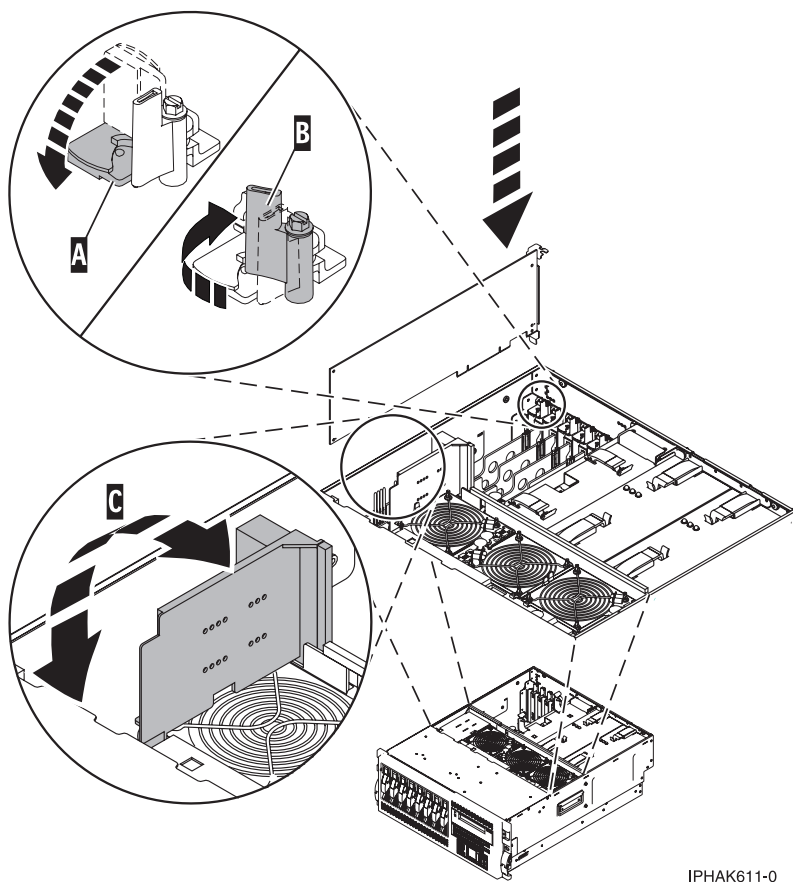
20. If you are installing a short adapter, continue to the next step.

If you are replacing or installing a long adapter, close and latch the PCI adapter light-pipe plate C attached to the fan tray as shown in figure Figure 15 on page 20 or Figure 16 on page 21.

**Note:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

21. Secure the adapter. Lower the tab A onto the PCI adapter faceplate as shown in figure Figure 15 on page 20 or Figure 16 on page 21. Rotate the adapter locking latch B clockwise until it covers the tab at approximately a 45-degree angle.

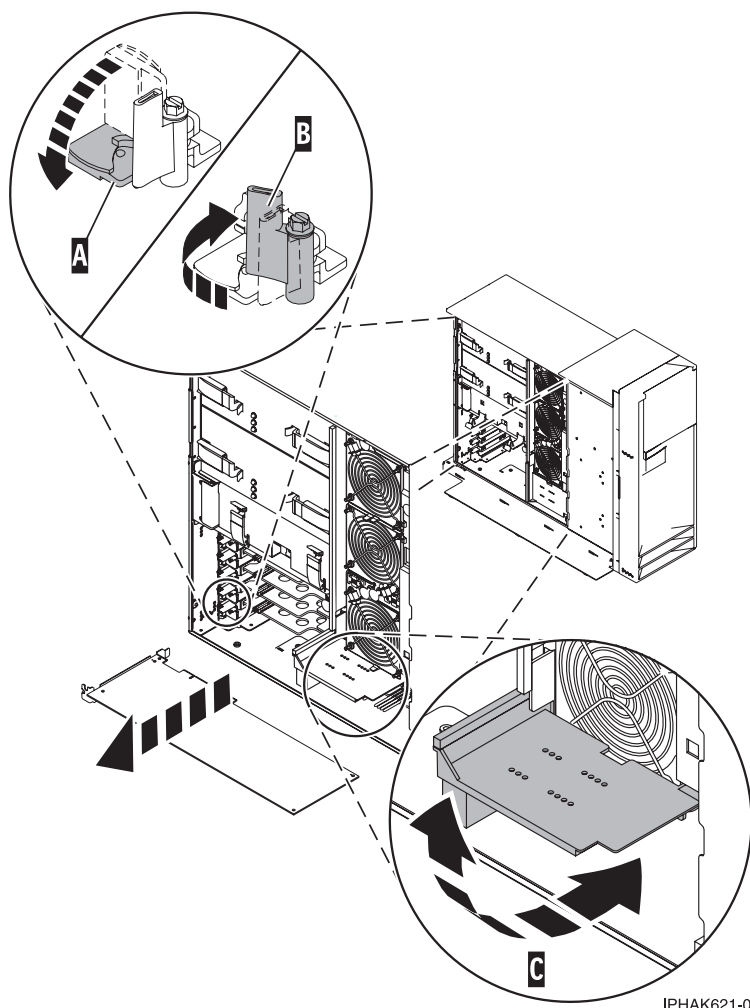




IPHAK611-0

Figure 15. Model 52x PCI adapter replaced in the rack-mounted system unit





IPHAK621-0

Figure 16. Model 52x PCI adapter replaced in the stand-alone system unit

22. Connect any adapter cables.
23. Replace or close the covers.
24. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
25. On a rack-mounted system, close the rear rack door.
26. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

### **Install model 285, 515, 52x, or attached expansion-unit, PCI adapters with system power on in i5/OS**

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, see Installing new hardware for i5/OS® logical partitions before installing a new PCI adapter and then return here to continue the procedure.

**Important:**

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To install a PCI adapter with the system power on in i5/OS, do the following:

1. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
  - Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
  - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392.
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.

- b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392.
  5. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
    - “Remove the back door and cover from the 5095 expansion unit” on page 388.
  6. If necessary, remove the adapter expansion slot shield.
  7. If necessary, remove the adapter from the antistatic package.
- Attention:** Avoid touching the components and gold-edge connectors on the adapter.
8. Place the adapter, component-side up, on a flat, antistatic surface.
  9. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
  10. Type `strsst` on the command line of the Main Menu and then press Enter.
  11. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
  12. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
  13. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
  14. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
  15. Type 9 (Hardware contained within package) in the **System Unit** or **Expansion Unit** field of the unit where you are replacing the card. Press Enter.
  16. Select the option to **Include empty positions**.
  17. Select **Concurrent Maintenance** on the card position where you want to replace the card and then press Enter.
  18. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Verify that this is the slot where you want to install the adapter.
  19. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
  20. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 17 on page 24 or Figure 18 on page 25.
  21. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
  22. If you are installing a short adapter, continue to the next step.  
If you are installing a long adapter, do the following:
    - a. Unlatch and open the PCI adapter light-pipe plate **C** that is attached to the fan tray as shown in figure Figure 17 on page 24 or Figure 18 on page 25.
    - b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
  23. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instruction in “Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters” on page 39, and then return here.

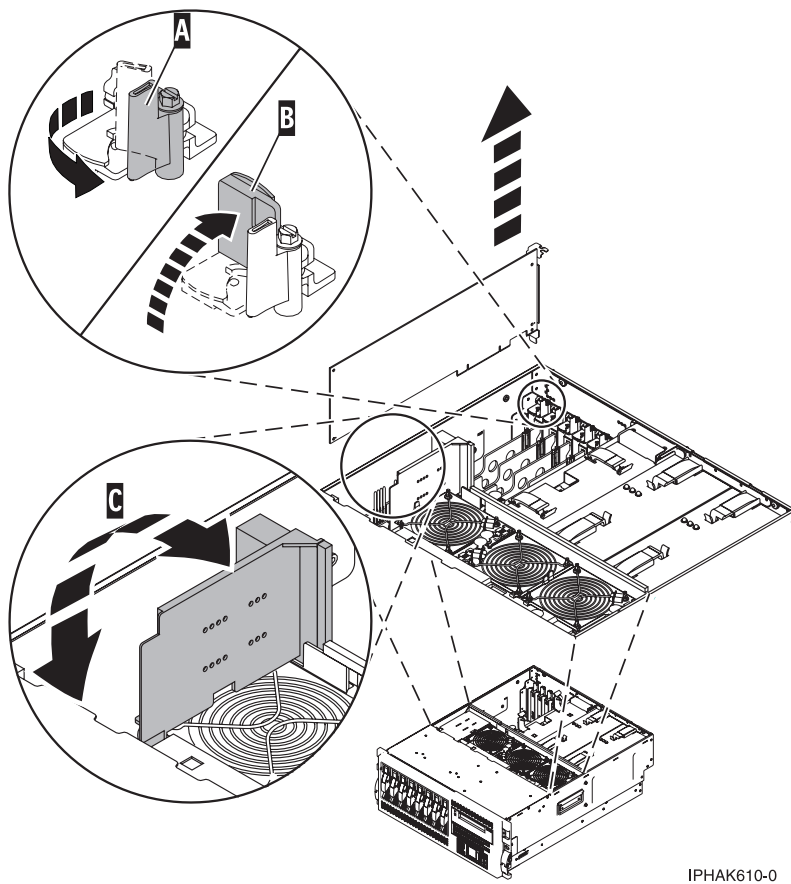
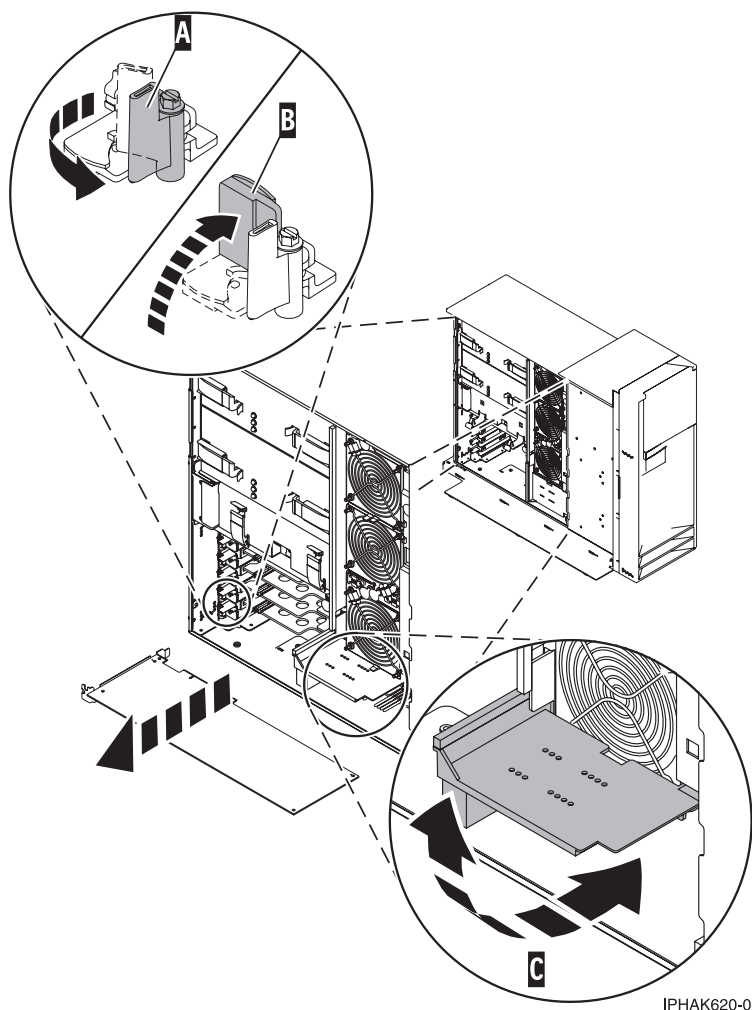


Figure 17. Model 52x PCI adapter or filler plate removed from the rack-mounted system unit



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Figure 18. Model 52x PCI adapter or filler plate removed from the stand-alone system unit

24. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
25. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

26. If you are installing a short adapter, continue to the next step. If you are replacing or installing a long adapter, close and latch the PCI adapter light-pipe plate C attached to the fan tray as shown in figure Figure 19 on page 26 or Figure 20 on page 27.

**Note:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

27. Secure the adapter. Lower the tab A onto the PCI adapter faceplate as shown in figure Figure 19 on page 26 or Figure 20 on page 27. Rotate the adapter locking latch B clockwise until it covers the tab at approximately a 45-degree angle.

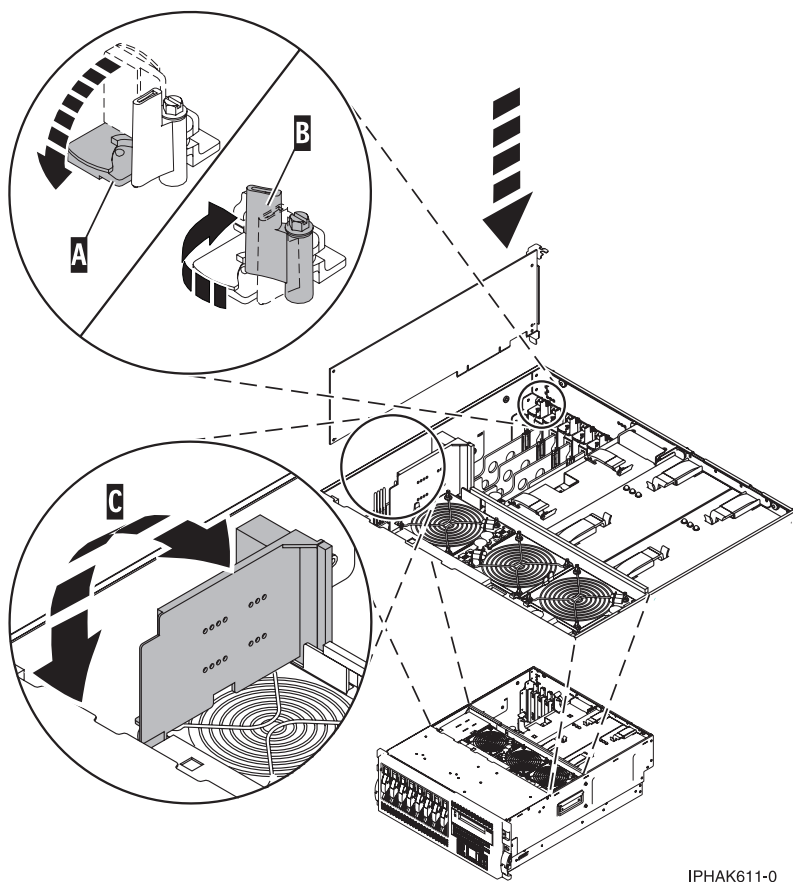
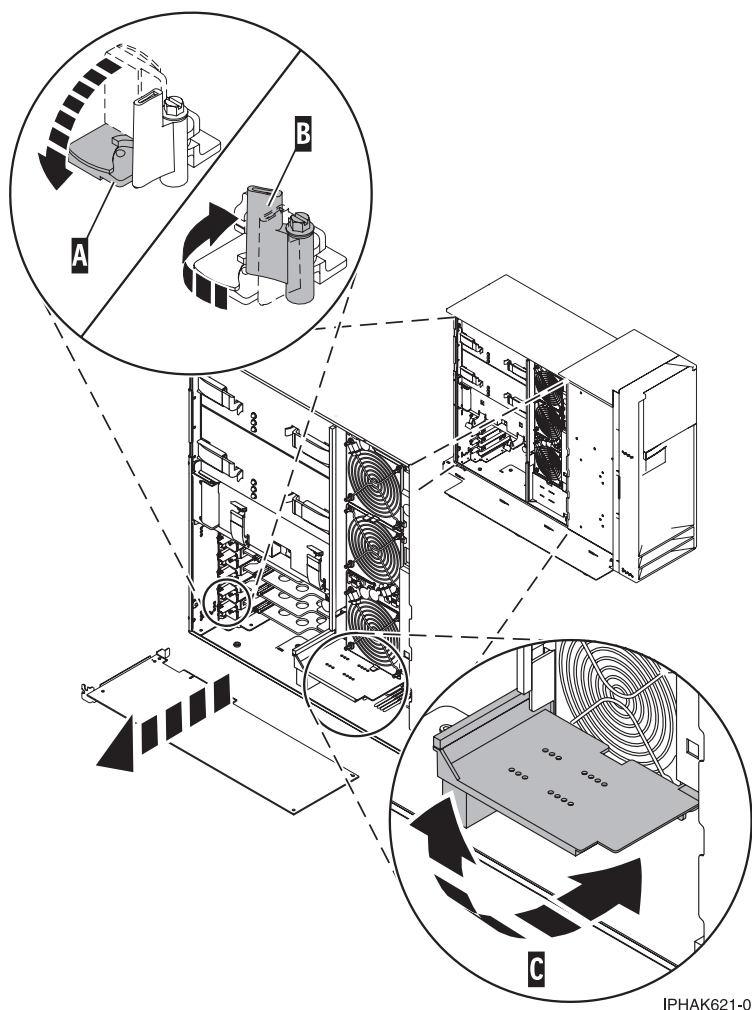


Figure 19. Model 52x PCI adapter replaced in the rack-mounted system unit



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Figure 20. Model 52x PCI adapter replaced in the stand-alone system unit

28. Connect any adapter cables.
29. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
30. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
31. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
32. Replace or close the covers.
33. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
34. On a rack-mounted system, close the rear rack door.
35. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

### Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in Linux

You might need to install a PCI adapter. Use the procedure in this section to perform this task.



If the system is partitioned, see Partitioning for Linux<sup>®</sup> to learn more about working in partitions, then return here to continue the procedure.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

To install a PCI adapter with the system power on in Linux, do the following:

1. Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 333.
2. “Verify that the Linux, hot-plug PCI tools are installed” on page 334.
3. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
4. Perform the prerequisite tasks described in “Before you begin” on page 336.
5. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
6. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392.
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following list:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392.
7. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.



- “Remove the back door and cover from the 5095 expansion unit” on page 388.
8. If necessary, remove the adapter expansion slot shield.
  9. If necessary, remove the adapter from the antistatic package.

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

10. Place the adapter, component-side up, on a flat, antistatic surface.
11. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in the 52x server, you must remove the blue handle or support bracket from the card.
12. Log in to the system console as the root user.
13. Use the `lsslot` command to list the hot-plug PCI slots that are available in the server or partition:

```
lsslot -c pci -a
```

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

# Slot	Description	Device(s)
U7879.001.DQD014E-P1-C1	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C4	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C5	PCI-X capable, 64 bit, 133MHz slot	Empty

Select the appropriate empty PCI slot from the ones listed by the `lsslot -c pci -a` command.

14. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 21 on page 30 or Figure 22 on page 31.
15. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
16. If you are installing a short adapter, continue to the next step. If you are installing a long adapter, do the following:
  - a. Unlatch and open the PCI adapter light-pipe plate **C** that is attached to the fan tray as shown in figure Figure 21 on page 30 or Figure 22 on page 31.
  - b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
17. Ensure the slot is empty. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instruction in “Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters” on page 39, and then return here.

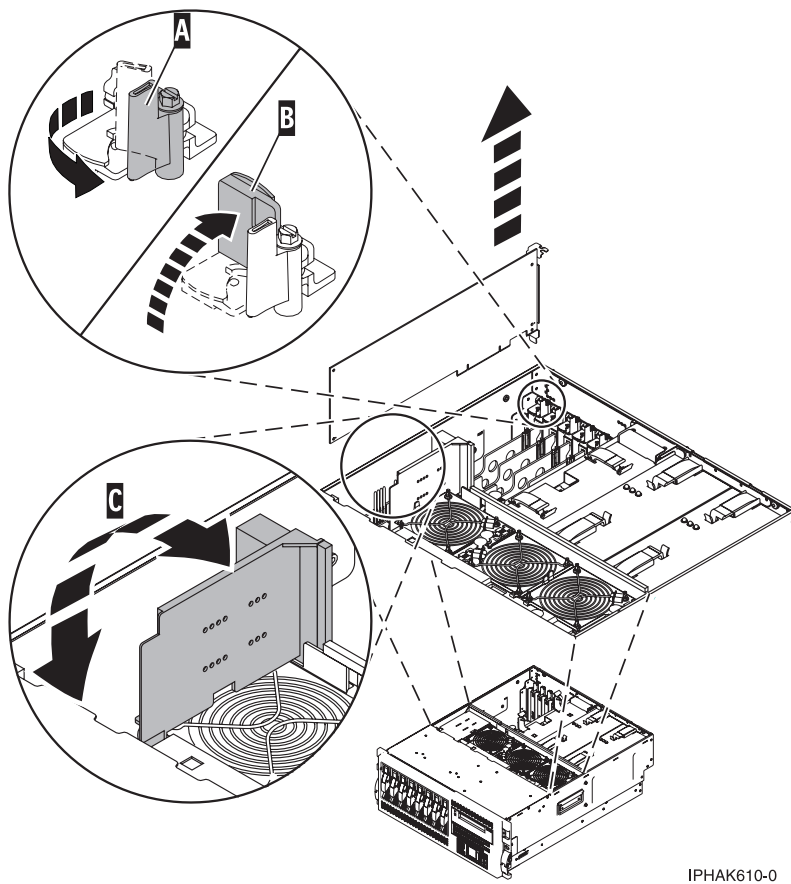
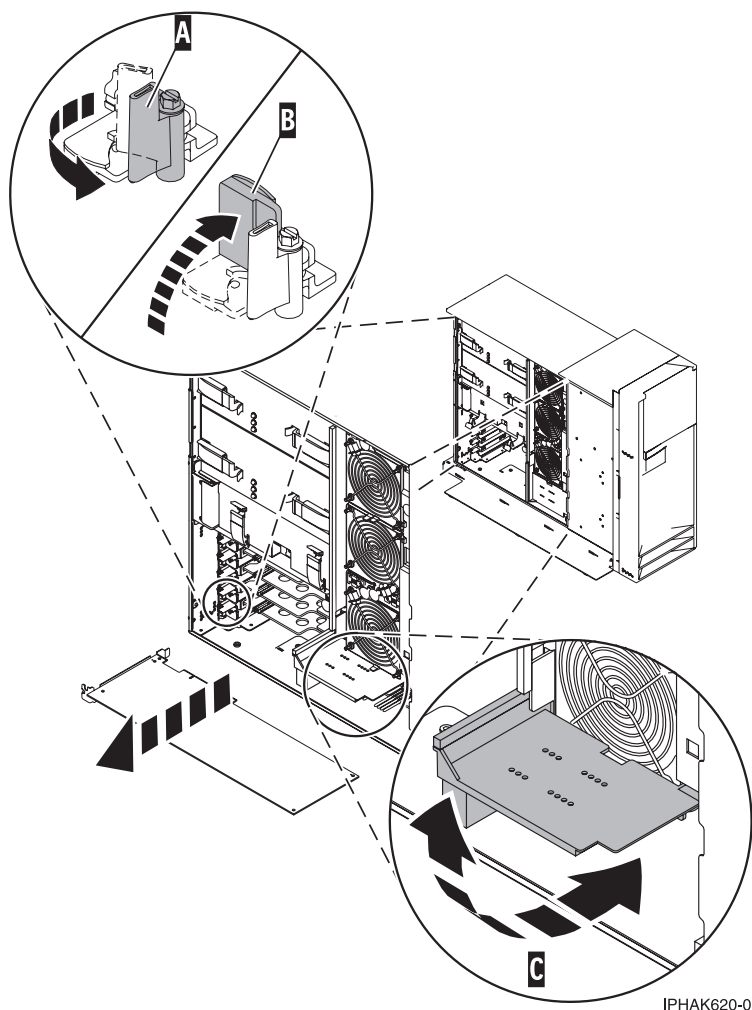


Figure 21. Model 52x PCI adapter or filler plate removed from the rack-mounted system unit



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Figure 22. Model 52x PCI adapter or filler plate removed from the stand-alone system unit

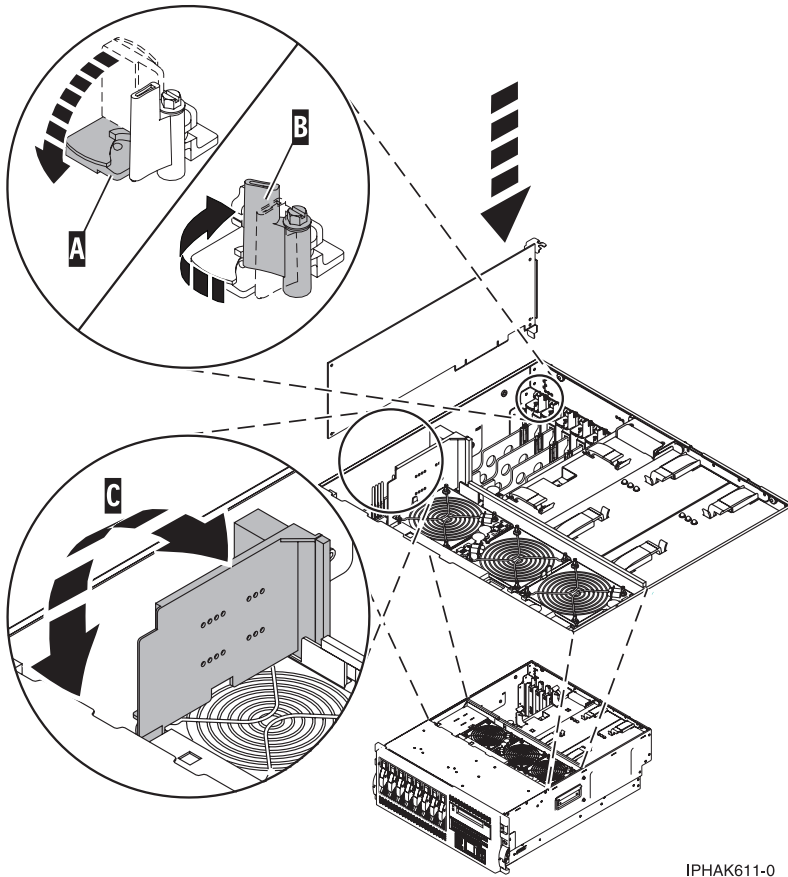
18. Run the `drslot_chrp_pci` command to enable an adapter to be installed.  
For example, to install the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:  
`drslot_chrp_pci -a -s U7879.001.DQD014E-P1-C3`  
Follow the instructions on the display to complete the task.
19. When you are instructed to install the adapter in the adapter slot.
  - a. 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.
  - b. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

  - c. If you are installing a short adapter, continue to the next step.  
If you are replacing or installing a long adapter, close and latch the PCI adapter light-pipe plate C attached to the fan tray as shown in figure Figure 23 on page 32 or Figure 24 on page 33.

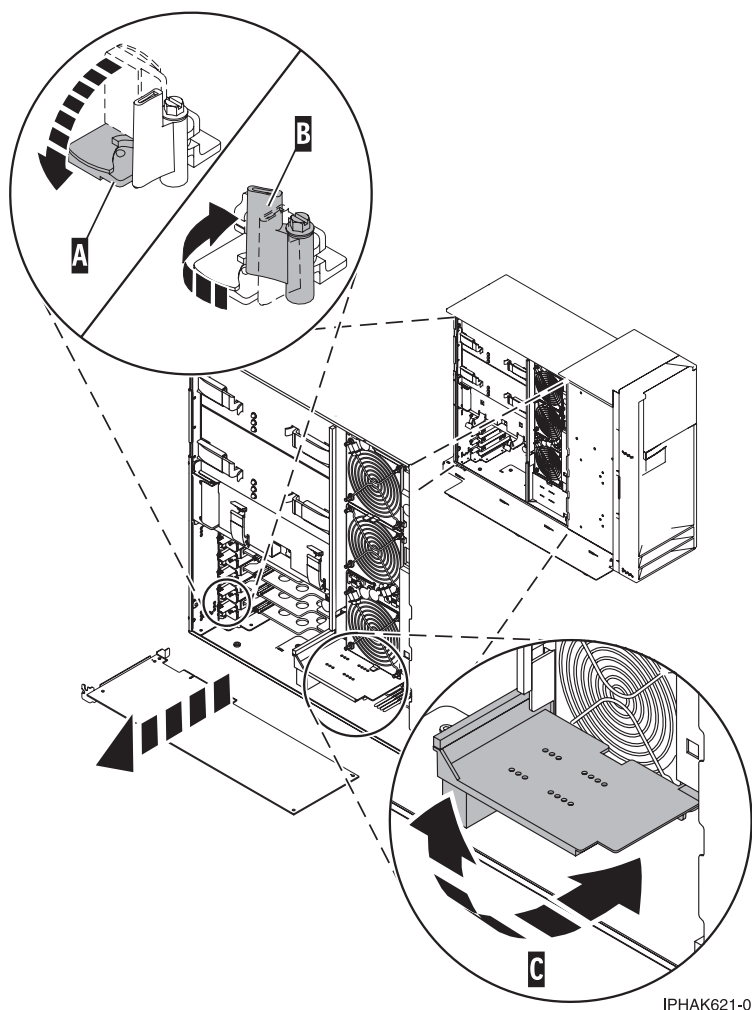
**Tip:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

- d. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in figure Figure 23 or Figure 24 on page 33. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.



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Figure 23. Model 52x PCI adapter replaced in the rack-mounted system unit



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Figure 24. Model 52x PCI adapter replaced in the stand-alone system unit

- e. Connect any adapter cables.
20. 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
21. Replace or close the covers.
22. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted server. If you are servicing a stand-alone server, continue to the next step.
23. On a rack-mounted server, close the rear rack door.
24. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

### Install model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power off

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

The following procedure describes the installation of PCI adapters with the system power off.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, select the appropriate information from the following list to learn more about working in a partitioned environment, and then return here:

- Partitioning for AIX
- Installing new hardware for i5/OS logical partitions
- Partitioning for Linux

To install a PCI adapter with the system power off, do the following:

1. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. “Stop the system or logical partition” on page 399.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover using one of the following methods:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392.
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following list:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.

- “Open the model 0595, 5095, or D20 service access cover” on page 392.
- 7. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
  - “Remove the back door and cover from the 5095 expansion unit” on page 388.
- 8. If necessary, remove the adapter expansion slot shield.
- 9. If necessary, remove the adapter from the antistatic package.

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

10. Place the adapter, component-side up, on a flat, antistatic surface.

**Note:** Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type, remove the blue handle or support bracket from the adapter.

11. If you are installing a short adapter, continue to the next step. If you are installing a long adapter, do the following:
  - a. Unlatch and open the PCI adapter light-pipe plate **C** that is attached to the fan tray as shown in figure Figure 25 on page 36 or Figure 26 on page 37.
  - b. Note the guide grooves located toward the front of the system in the disk drive backplane when aligning the adapter.
12. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 25 on page 36 or Figure 26 on page 37.
13. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
14. Ensure the slot is empty. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instructions in “Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters” on page 39, and then return here.

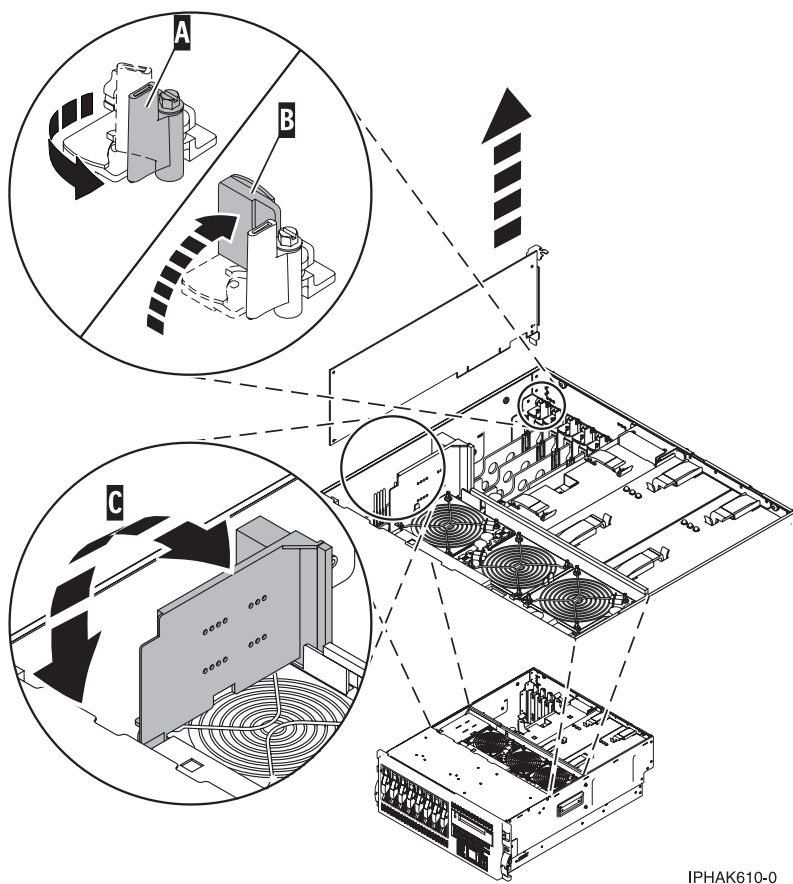


Figure 25. Model 52x PCI adapter or filler plate removed from the rack-mounted system unit



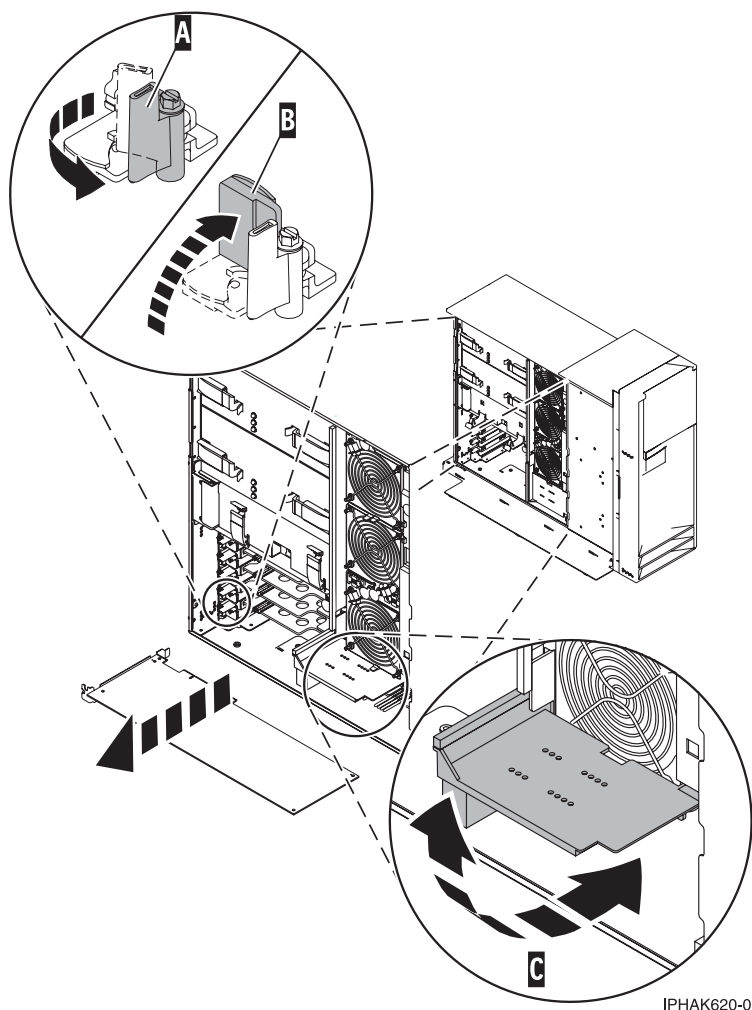


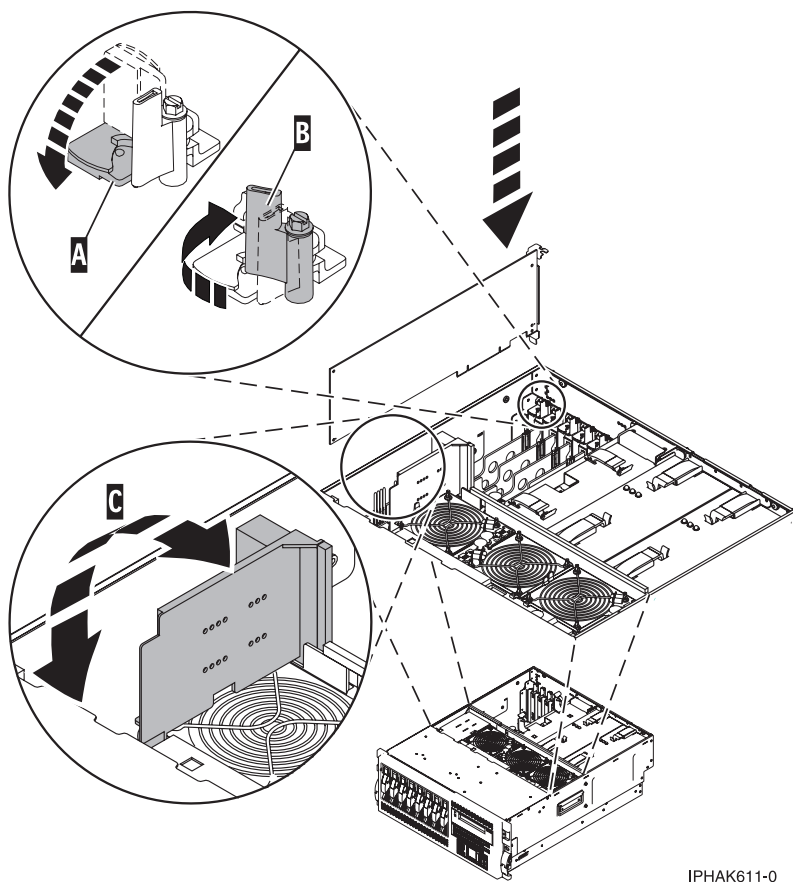
Figure 26. Model 52x PCI adapter or filler plate removed from the stand-alone system unit

15. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
16. Press the adapter firmly into its connector.
17. If you are installing a short adapter, continue to the next step. If you are installing a long adapter, do the following:

Close and latch the PCI adapter light-pipe plate **C** attached to the fan tray as shown in figure Figure 27 on page 38 or Figure 28 on page 39.

**Note:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

18. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in figure Figure 27 on page 38 or Figure 28 on page 39. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.



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Figure 27. Model 52x PCI adapter replaced in the rack-mounted system unit

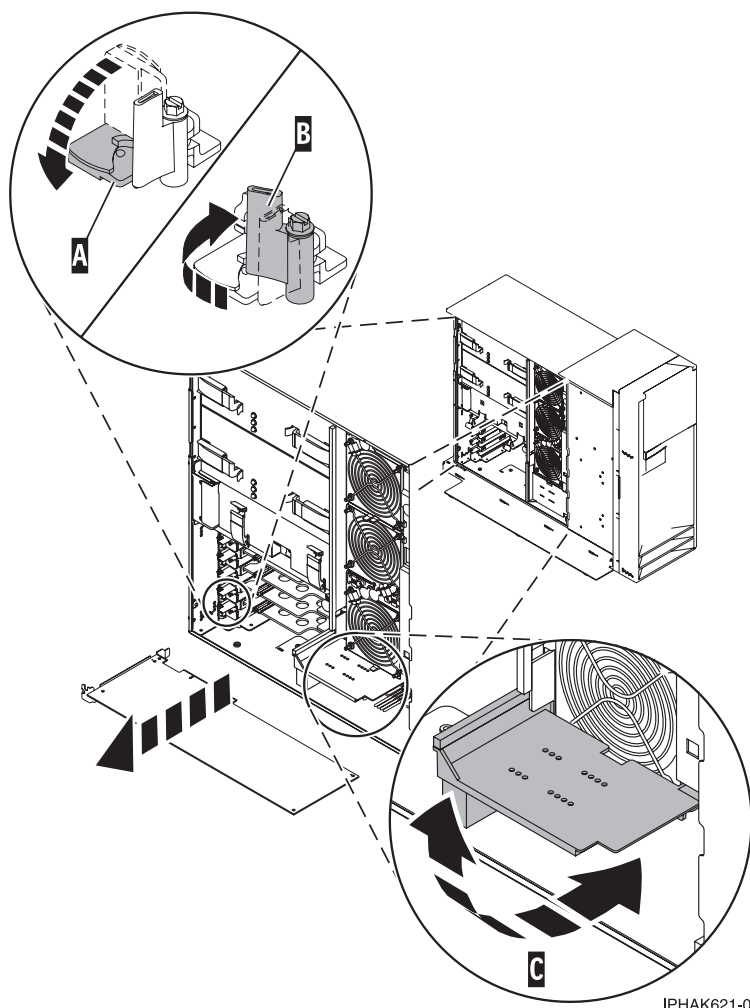


Figure 28. Model 52x PCI adapter replaced in the stand-alone system unit

19. Connect any adapter cables.
20. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
21. Replace or close the covers.
22. On a rack-mounted system, close the rear rack door.
23. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
24. Reconnect the power source to the system.
25. "Start the system or logical partition" on page 398.
26. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

### Remove model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in AIX

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

- If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.
- Use this procedure to remove a PCI adapter and leave the slot in the system unit empty. To remove a failing adapter and replace it with the same adapter, see “Remove and replace Model 285, 52x, or attached expansion-units, PCI adapters with the system power on in AIX” on page 54.
- If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, then install the adapter as described in “Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in AIX” on page 16.
- Procedures performed on a PCI adapter with the system power on in AIX, 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 a PCI adapter with the system power on in AIX, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
4. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
5. Determine which adapters you plan to remove.
6. Record the slot number and location of each adapter being removed.

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

7. Ensure that any processes or applications that might use the adapter are stopped.

8. Enter the system diagnostics program by logging in as root user or as the celogin user, type **diag** at the AIX command line.
9. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
10. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
11. At the Task Selection list, select **PCI Hot Plug Manager**.
12. Select **Unconfigure a Device**, then press Enter.
13. Press F4 (or Esc+4) to display the **Device Names** menu.
14. Select the adapter you are removing in the **Device Names** menu.
15. Use the Tab key to respond **NO** to **Keep Definition**. Use the Tab key again to respond **YES** to **Unconfigure Child Devices**, then press Enter.
16. The **ARE YOU SURE** window displays. Press Enter to verify the information. If the change is successful an OK message displays next to the Command field at the top of the display.
17. Press F4 (or Esc+4) twice to return to the **Hot Plug Manager** menu.
18. Select **replace/remove PCI Hot Plug adapter**.
19. Select the slot that has the device to be removed from the system.
20. 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.

21. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
22. Label, and then disconnect all cables attached to the adapter you plan to remove.
23. 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 29 on page 42 or Figure 30 on page 43.
24. Rotate the adapter locking latch **A** counterclockwise.
25. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
26. 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.

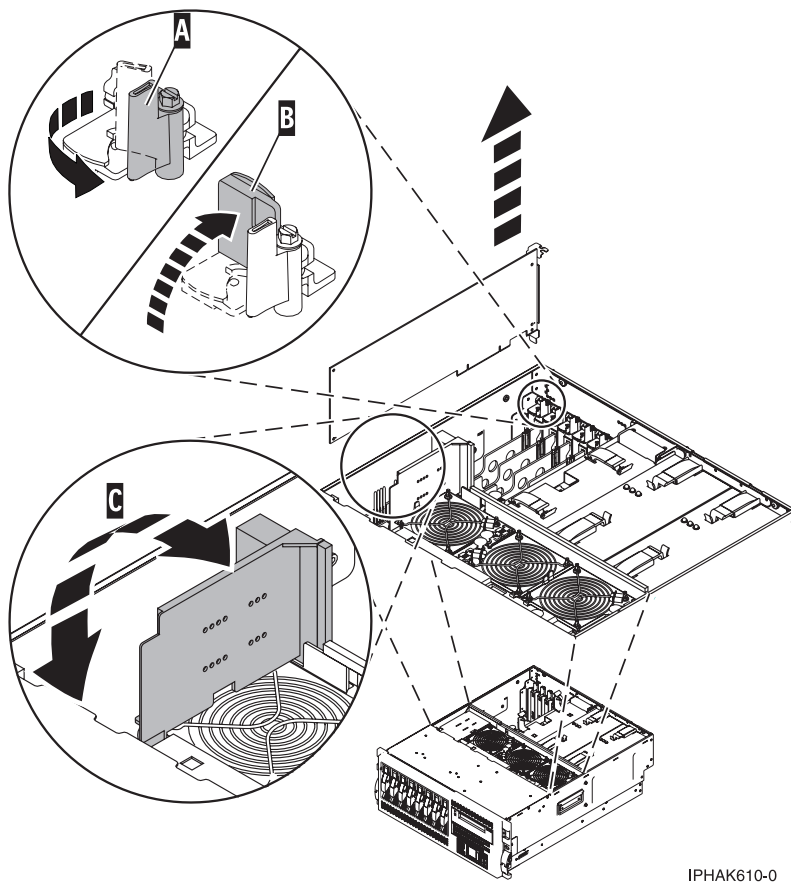
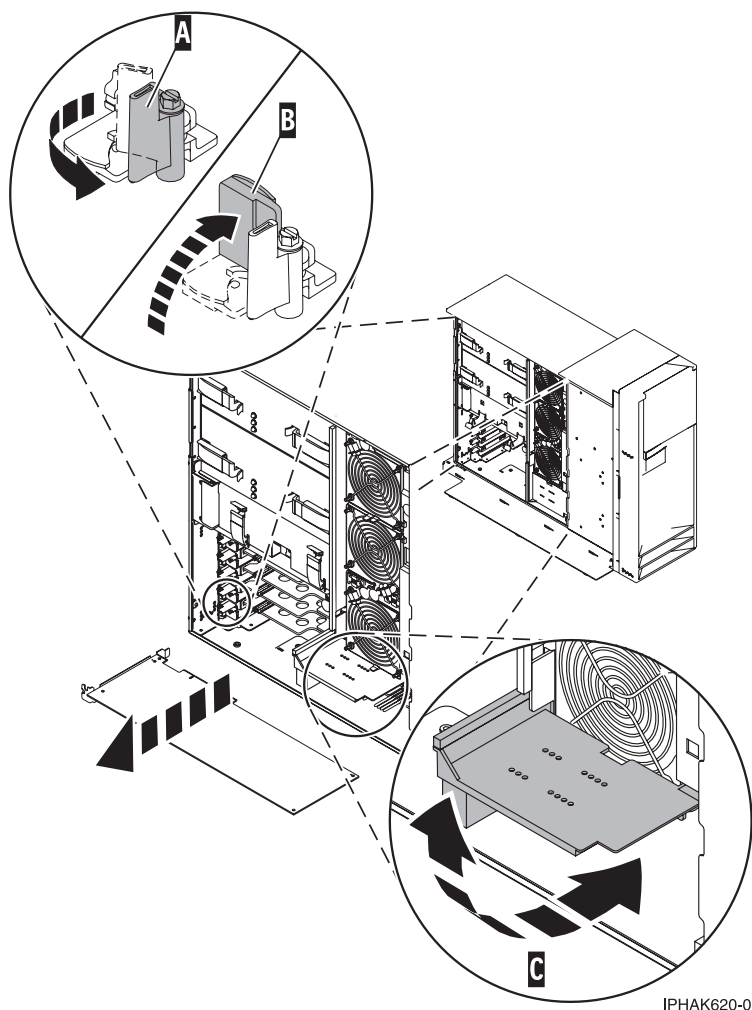


Figure 29. Model 52x PCI adapter removed from the rack-mounted system unit



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Figure 30. PCI adapter removed from the stand-alone system unit

27. If you plan to install another adapter into the vacated slot, go to “Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in AIX” on page 16; otherwise, continue with the next step.
28. Seal the expansion slot using an expansion-slot cover.
29. Lower the plastic retainer seat over the PCI adapter faceplate.
30. Rotate the locking latch clockwise until it clicks into the locked position.
31. Continue to follow the online instructions until you receive a message that the adapter removal is successful.
32. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu.
33. When you are finished removing adapters, press F10 to exit the Hot-Plug Manager.
34. Run the diag -a command the AIX command line. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
35. Replace or close the covers.
36. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system.
37. On a rack-mounted system, close the back rack door.

## Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power on in i5/OS

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

### Important:

- If the adapter is the load source IOA or the load source IOP, or any other storage IOA or IOP with critical DASD attached for the system or partition, follow the on-screen instructions when you use HSM to power down the IOP or IOA. Instructions to use functions 68 and 69 on the control panel will be included.
- If the adapter is the console IOA or the console IOP for the system or partition, you must perform the maintenance from an i5/OS session connected through a different IOA or IOP, or you must power down the partition to perform maintenance.
- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To remove a PCI adapter with the system power on in i5/OS, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:



- “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
  - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
  - “Open the model 0595, 5095, or D20 service access cover” on page 392
5. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
    - “Remove the back door and cover from the 5095 expansion unit” on page 388
  6. Type **strsst** on the command line of the Main Menu and press Enter.
  7. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
  8. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
  9. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
  10. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
  11. 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.
  12. Select the option to **Include empty positions**.
  13. Select **Concurrent Maintenance** on the card position where you want to remove the card and then press Enter.
  14. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to remove the adapter.
  15. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
  16. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
  17. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power off complete
  18. Label, and then disconnect all cables attached to the adapter you plan to remove.
  19. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system.
  20. If you are removing a short adapter, continue to the next step. If you are removing a long adapter, do the following:  
Unlatch and open the PCI adapter light-pipe plate **C** attached to the fan tray as shown in figure Figure 31 on page 46 or Figure 32 on page 47.
  21. Rotate the adapter locking latch **A** counterclockwise.
  22. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
  23. 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.

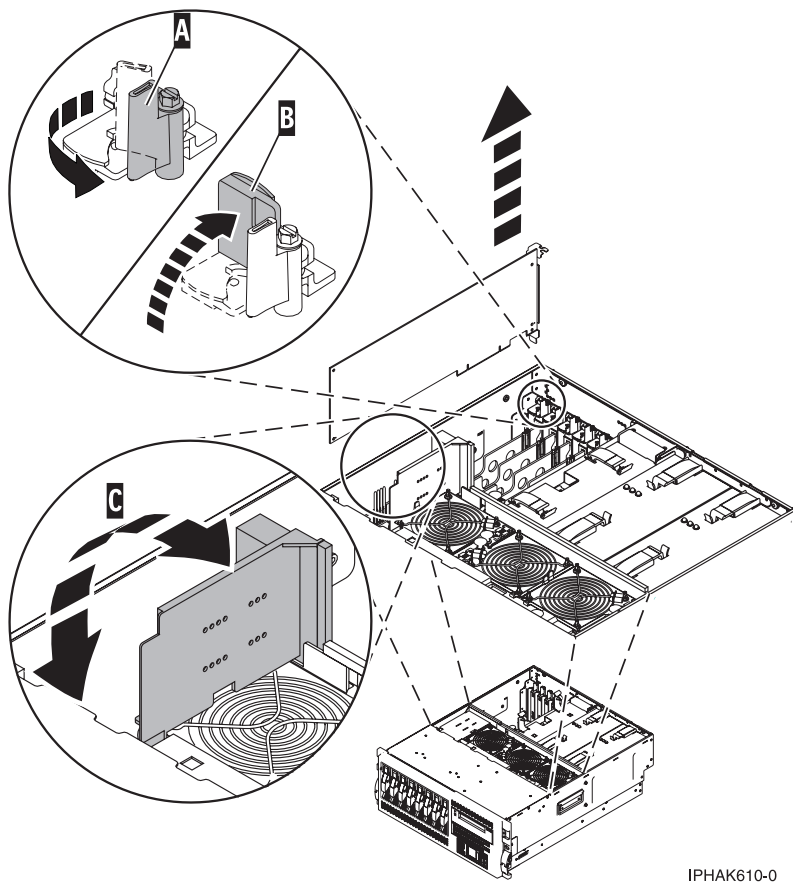
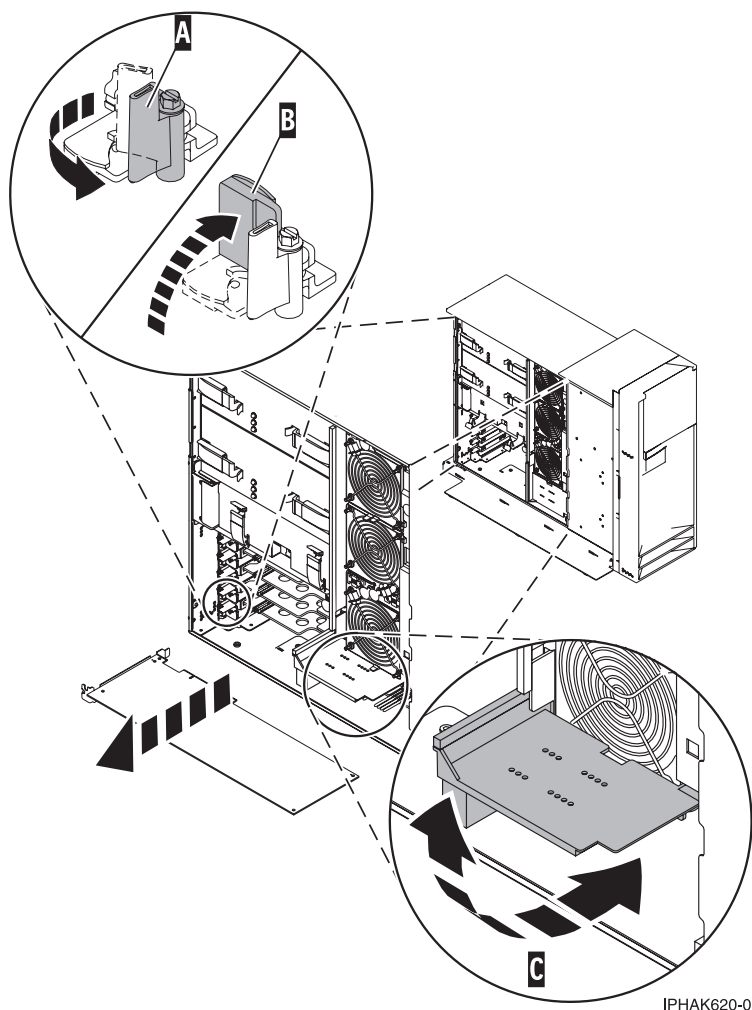


Figure 31. PCI adapter removed from the rack-mounted system unit



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Figure 32. PCI adapter removed from the stand-alone system unit

24. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
25. If you plan to install another adapter into the vacated slot, go to “Install model 285, 515, 52x, or attached expansion-unit, PCI adapters with system power on in i5/OS” on page 21; otherwise, continue with the next step.
26. Seal the expansion slot using an expansion-slot cover.
27. Replace or close the covers.
28. On a rack-mounted system, close the rear rack door.
29. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
30. To replace the PCI adapter, see “Replace model 285, 515, 52x, or attached expansion-units, PCI adapters” on page 54.

### **Remove model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in Linux**

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

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

1. Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 333.
2. “Verify that the Linux, hot-plug PCI tools are installed” on page 334.
3. Perform the prerequisite tasks described in “Before you begin” on page 336.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.

**Note:**

a.

If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.

- b. Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
- For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
6. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
    - “Remove the back door and cover from the 5095 expansion unit” on page 388
  7. Determine which adapters you plan to remove.
  8. Record the slot number and location of each adapter being removed.

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

9. Ensure that any processes or applications that might use the adapter are stopped.

10. 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.

11. 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:

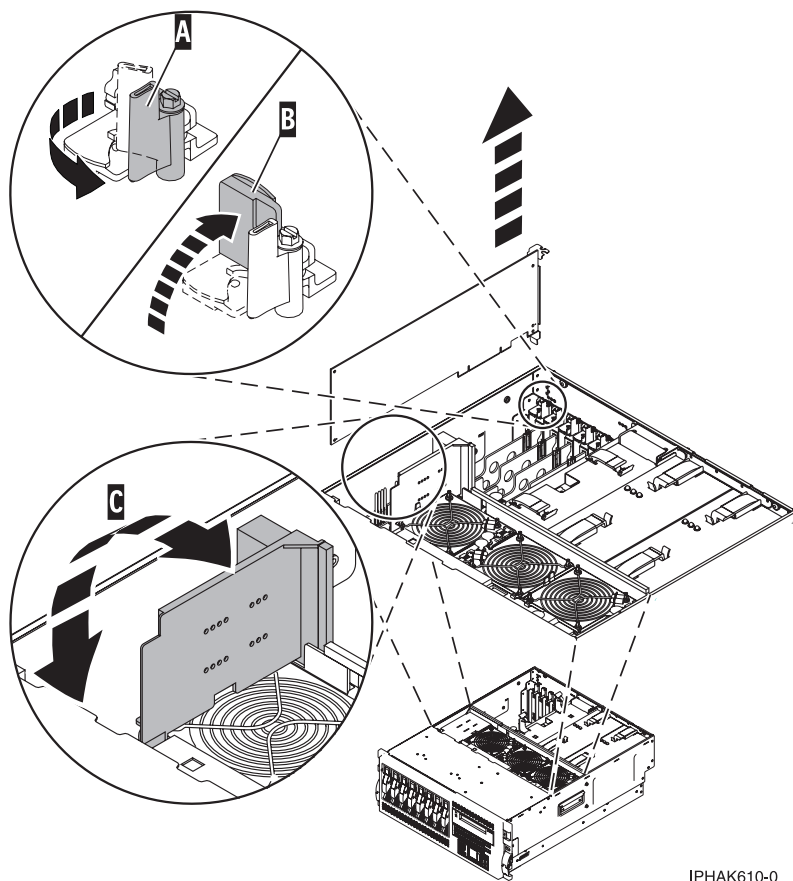
```
drslot_chrp_pci -r -s U7879.001.DQD014E-P1-C3
```

Follow the instructions on the display to complete the task.

12. If you are removing a short adapter, continue to the next step. If you are removing a long adapter, do the following:

Unlatch and open the PCI adapter light-pipe plate **C** attached to the fan tray as shown in figure Figure 33 or Figure 34 on page 50.

13. Rotate the adapter locking latch **A** counterclockwise.
14. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
15. 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.



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Figure 33. PCI adapter removed from the rack-mounted system unit

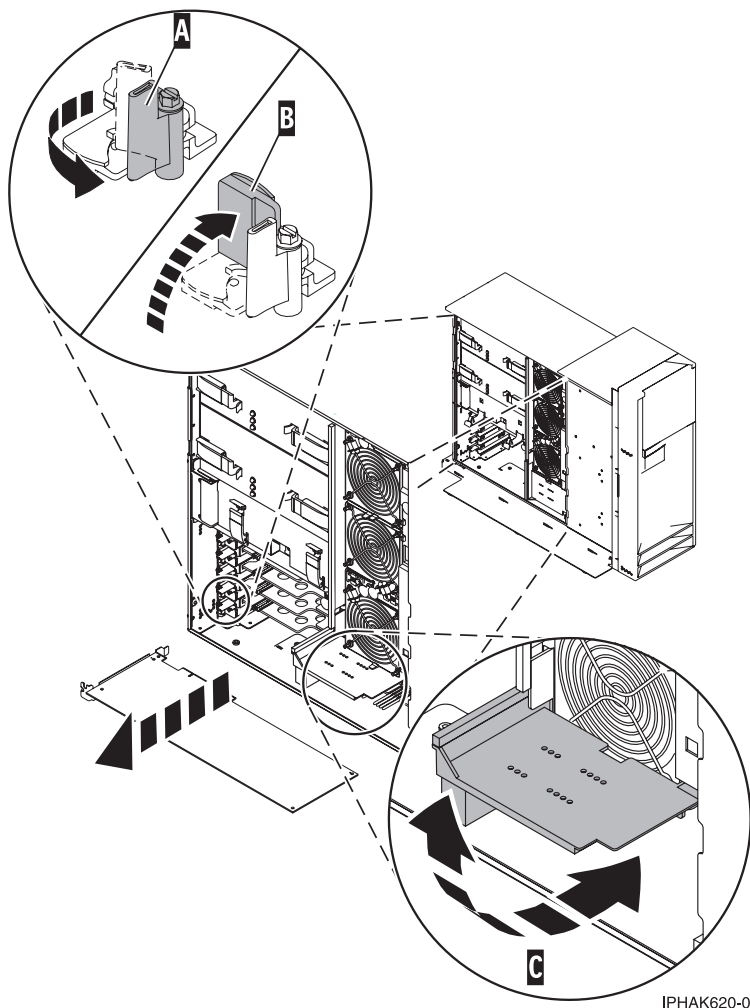


Figure 34. PCI adapter removed from the stand-alone system unit

16. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
17. If you plan to install another adapter into the vacated slot, go to “Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in Linux” on page 27; otherwise, continue with the next step.
18. Seal the expansion slot using an expansion-slot cover.
19. Lower the plastic retainer seat over the PCI adapter faceplate.
20. Rotate the locking latch clockwise until it clicks into the locked position.
21. Replace or close the covers.
22. On a rack-mounted system, close the rear rack door.
23. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
24. To replace the PCI adapter, see “Replace model 285, 515, 52x, or attached expansion-units, PCI adapters” on page 54.

### **Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power off**

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

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

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. “Stop the system or logical partition” on page 399.
5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 520 system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
7. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
8. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
9. Record the slot number and location of each adapter being removed.

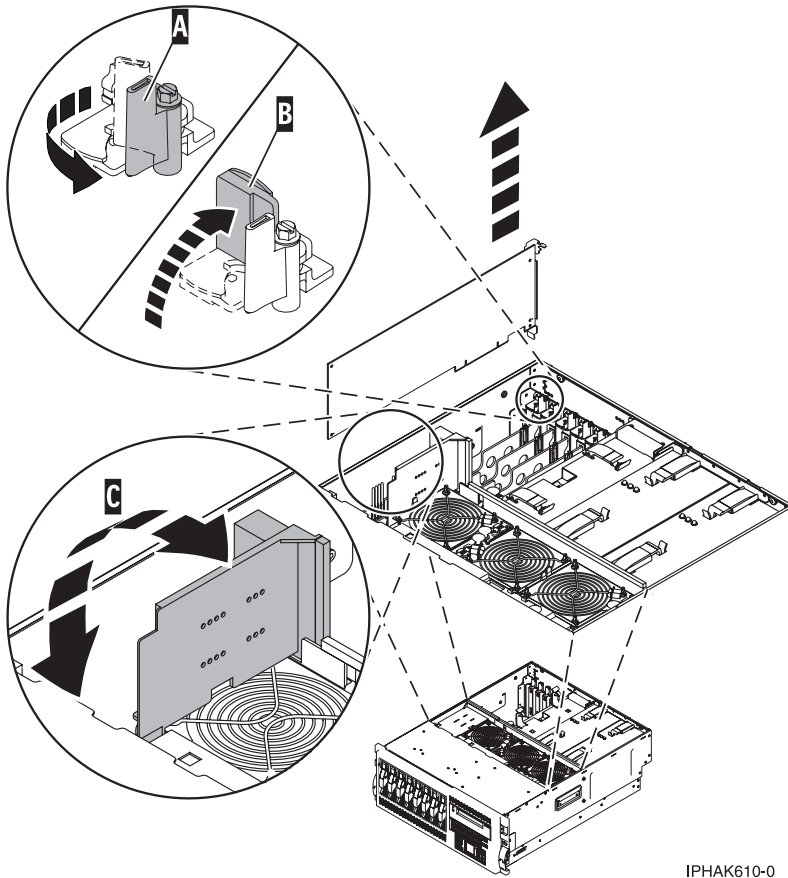
**Note:** Adapter slots are numbered on the rear of the system.

10. If you are removing a short adapter, continue to the next step. If you are removing a long adapter, do the following:

Unlatch and open the PCI adapter light-pipe plate C attached to the fan tray as shown in figure Figure 35 on page 52 or Figure 36 on page 53.



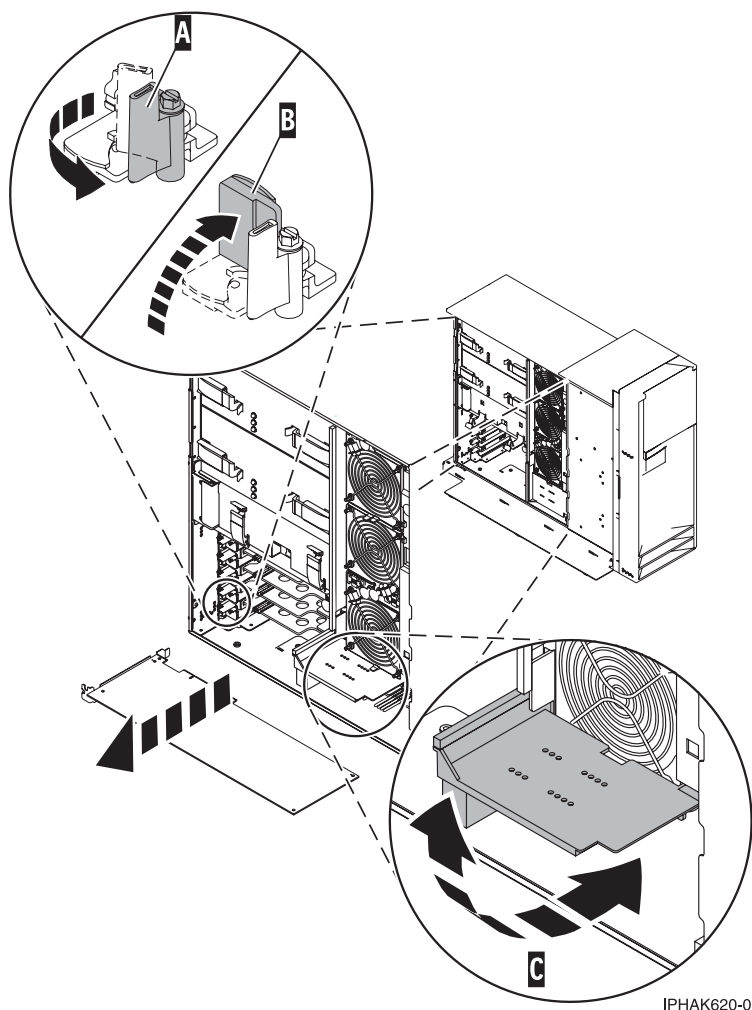
11. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 35 or Figure 36 on page 53.
12. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
13. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.



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Figure 35. PCI adapter removed from the rack-mounted system unit





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Figure 36. PCI adapter removed from the stand-alone system unit

14. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
15. If you plan to install another adapter into the vacated slot, go to "Replace model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power off" on page 66; otherwise, continue with the next step.
16. Seal the expansion slot using an expansion-slot cover.
17. Replace or close the covers.
18. Reconnect the power source to the system.
19. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
20. On a rack-mounted system, close the rear rack door.
21. "Start the system or logical partition" on page 398.
22. To replace the PCI adapter, see "Replace model 285, 515, 52x, or attached expansion-units, PCI adapters" on page 54.

## Replace model 285, 515, 52x, or attached expansion-units, PCI adapters

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## Remove and replace Model 285, 52x, or attached expansion-units, PCI adapters with the system power on in AIX

You might need to remove and replace a PCI adapter. Use the procedure in this section to perform this task.

Read the following notes to determine if this is the correct procedure for the task to be performed.

### Note:

1. Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.
2. If you plan to remove a failing adapter and leave the slot empty, see “Remove model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in AIX” on page 39.
3. This procedure should not be used to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in “Remove model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in AIX” on page 39, then install the new adapter as described in “Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in AIX” on page 16.
4. Procedures performed on a PCI adapter with the system power on in AIX, 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.

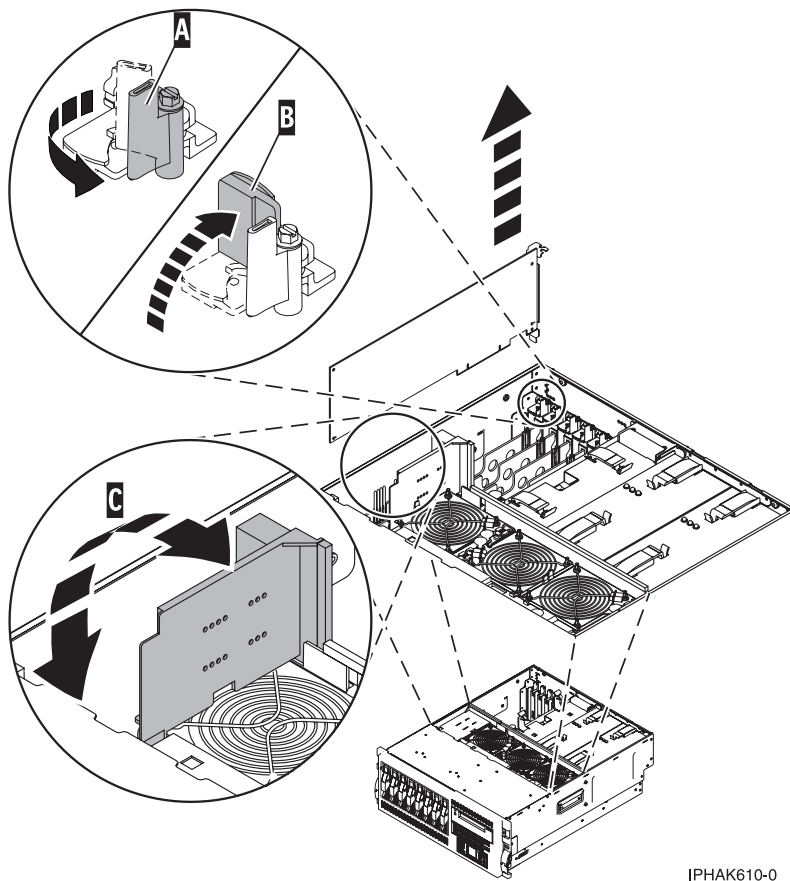
To replace a failing PCI adapter with the system power on in AIX, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are replacing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.

- For the 52x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
4. If you are removing or replacing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
    - “Remove the back door and cover from the 5095 expansion unit” on page 388
  5. Determine which adapter you plan to remove.
  6. Adapter slots are numbered on the rear of the system unit, record the slot number and location of each adapter being removed.
  7. Ensure that any processes or applications that might use the adapter are stopped.
  8. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
  9. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
  10. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
  11. At the Task Selection list, select **PCI Hot Plug Manager**.
  12. Select **Unconfigure a Device**, then press Enter.
  13. Press F4 (or Esc +4) to display the Device Names menu.
  14. Select the adapter you are removing in the **Device Names** menu.
  15. In the **Keep Definition** field, use the Tab key to answer Yes. In the **Unconfigure Child Devices** field, use the Tab key again to answer YES, then press Enter.
  16. 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.
  17. Press F4 (or Esc +4) twice to return to the **Hot Plug Manager** menu.
  18. Select **replace/remove PCI Hot Plug adapter**.
  19. Select the slot that has the device to be removed from the system.
  20. Select **replace**.

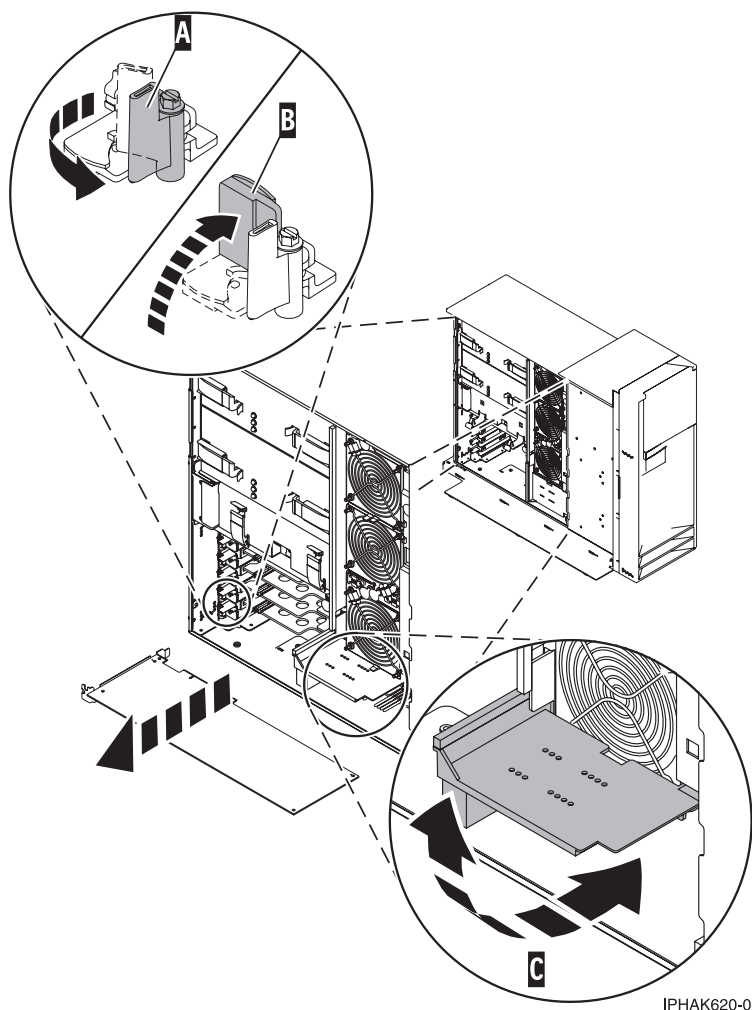
**Note:** A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

21. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
22. Label, and then disconnect all cables attached to the adapter you plan to remove.
23. 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 Figure 37 or Figure 38 on page 57.
24. Rotate the adapter locking latch **A** counterclockwise.
25. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
26. 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.



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Figure 37. Model 52x PCI adapter removed from the rack-mounted system unit



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Figure 38. PCI adapter removed from the stand-alone system unit

27. If necessary, remove the replacement adapter from the antistatic package.

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

28. Carefully grasp the replacement adapter by its top edge, and align it with the expansion slot and its connector on the system backplane.
29. Press the adapter firmly into its connector.  
Ensure that it is completely and correctly seated in its connector.
30. 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 Figure 39 on page 58 or Figure 40 on page 59.

**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.
31. Secure the adapter. Lower the tab A onto the PCI adapter faceplate as shown in figure Figure 39 on page 58 or Figure 40 on page 59. Rotate the adapter locking latch B clockwise until it covers the tab at approximately a 45-degree angle.

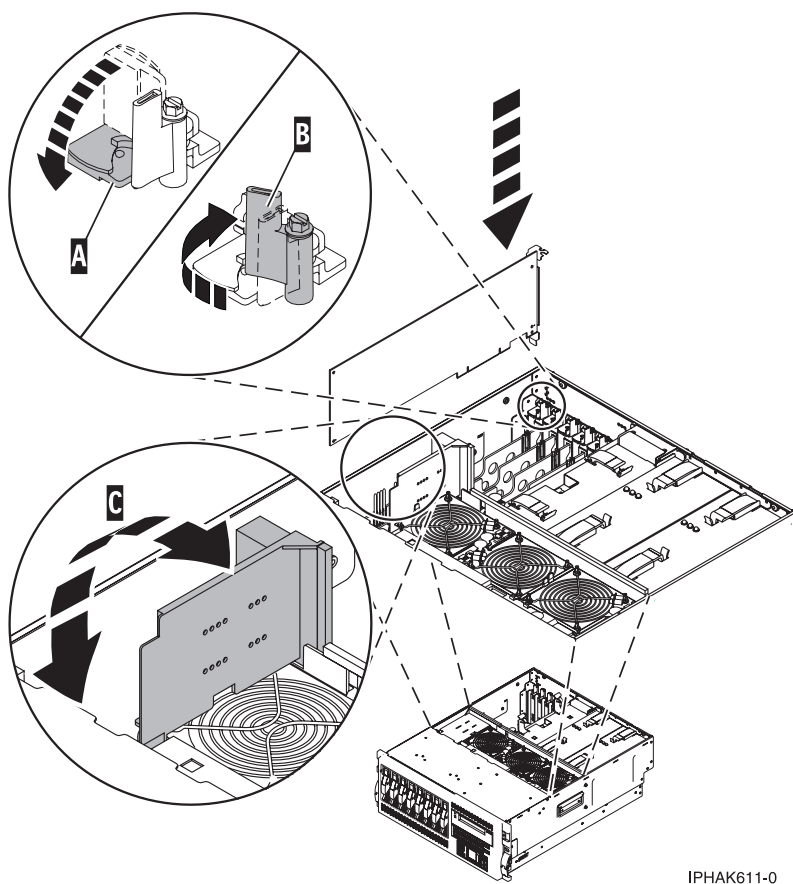


Figure 39. PCI adapter replaced in the rack-mounted system unit

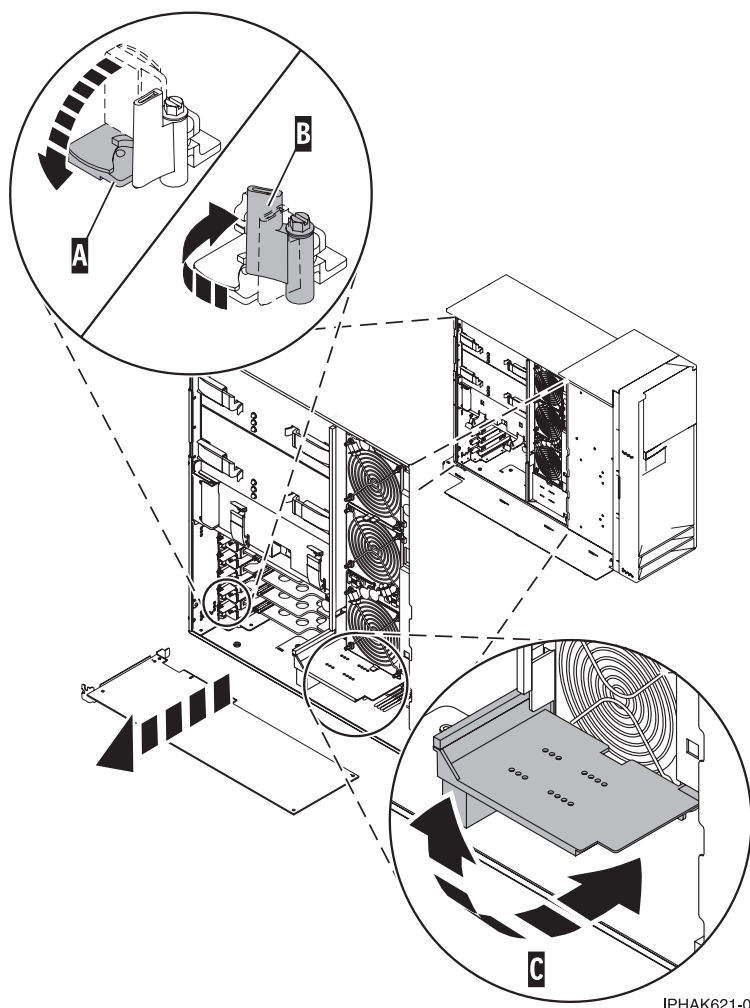


Figure 40. PCI adapter replaced in the stand-alone system unit

32. Connect the adapter cables.
33. 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.
34. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
35. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
36. Select **Log Repair Action**.
37. Select the resource just replaced, press Enter, press Commit (F7 or Esc+7), then press Enter.
38. Press F3 (or Esc+3) to return to **TASK Selection List**.
39. Select **Hot Plug Task**, press enter.
40. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.
41. Select the device just replaced from the list, then press Enter. The device is now configured.
42. Press the F10 key to exit the diagnostic program.

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

43. 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.
- 44. Press the F10 key to exit the diagnostic program.
- 45. On a rack-mounted system, close the rear rack door.
- 46. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
- 47. Replace or close the covers.
- 48. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

## **Replace a model 285, 515, 52x, or attached expansion-unit, PCI adapter with the system power on in i5/OS**

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

You must have already completed the procedure “Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power on in i5/OS” on page 44 in order to have the slot powered off.

### **Important:**

- If the adapter is the load source IOA or the load source IOP, or any other storage IOA or IOP with critical DASD attached for the system or partition, follow the on-screen instructions when you use HSM to power down the IOP or IOA. Instructions to use functions 68 and 69 on the control panel will be included.
- If the adapter is the console IOA or the console IOP for the system or partition, you must perform the maintenance from an i5/OS session connected through a different IOA or IOP, or you must power down the partition to perform maintenance.
- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you



are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To replace an 52x PCI adapter with the system power on in i5/OS, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If necessary, remove the adapter from the antistatic package.

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

4. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
5. Press the adapter firmly into its connector.  
Ensure that it is completely and correctly seated in its connector.
6. 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 Figure 41 on page 62 or Figure 42 on page 63.

**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.
7. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in figure Figure 41 on page 62 or Figure 42 on page 63. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.

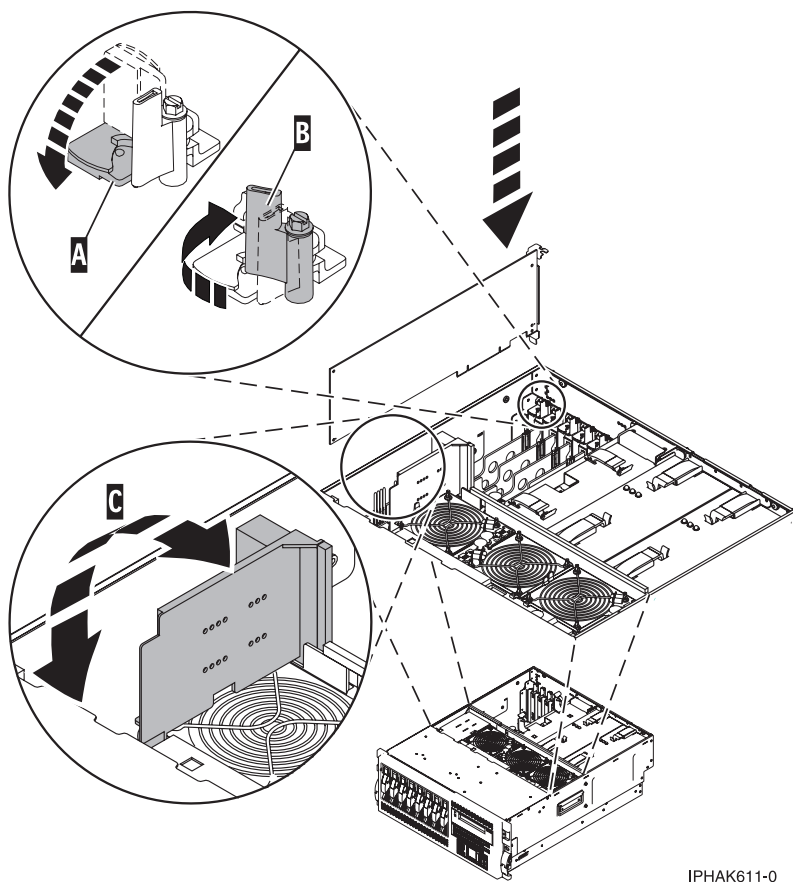
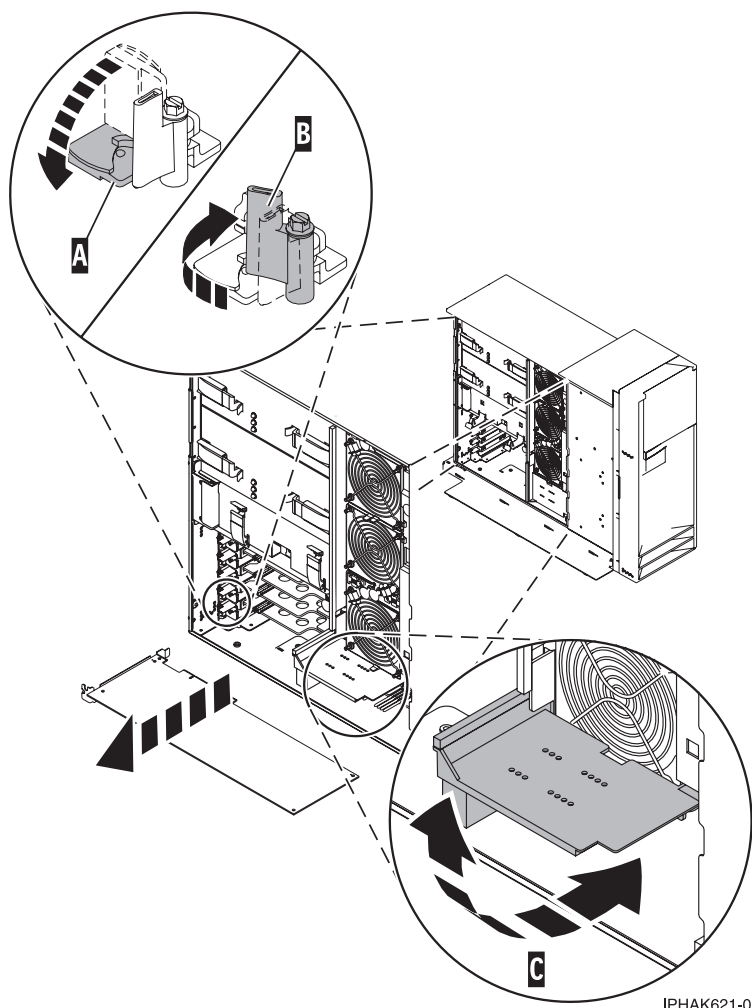


Figure 41. PCI adapter replaced in the rack-mounted system unit



IPHAK621-0

Figure 42. PCI adapter replaced in the stand-alone system unit

8. Connect the adapter cables.
9. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
10. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
11. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
12. Replace or close the covers.
13. On a rack-mounted system, close the rear rack door.
14. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
15. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

### Replace model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in Linux

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

To start this procedure you must have completed the “Remove model 285, 52x, or attached expansion-unit, PCI adapters with the system power on in Linux” on page 47.

To replace a PCI adapter with the system power on in Linux, do the following:

1. If necessary, remove the adapter from the antistatic package.

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

2. Place the adapter, component-side up, on a flat, antistatic surface.
3. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in the 52x server, you must remove the blue handle or support bracket from the card.
4. Run the `drslot_chrp_pci` command to enable an adapter to be replaced:

For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

```
drslot_chrp_pci -R -s U7879.001.DQD014E-P1-C3
```

Follow the instructions on the screen to complete the task. When you are instructed to insert the adapter in the adapter slot, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

5. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

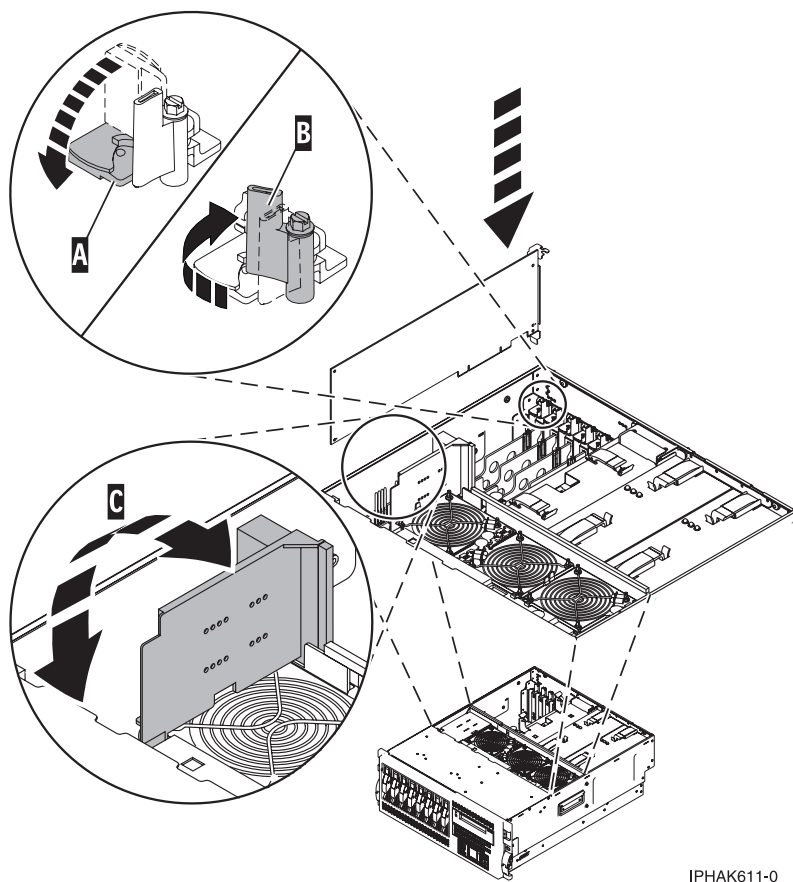
6. If you are replacing a short adapter, continue to the next step.

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 Figure 43 on page 65 or Figure 44 on page 66.

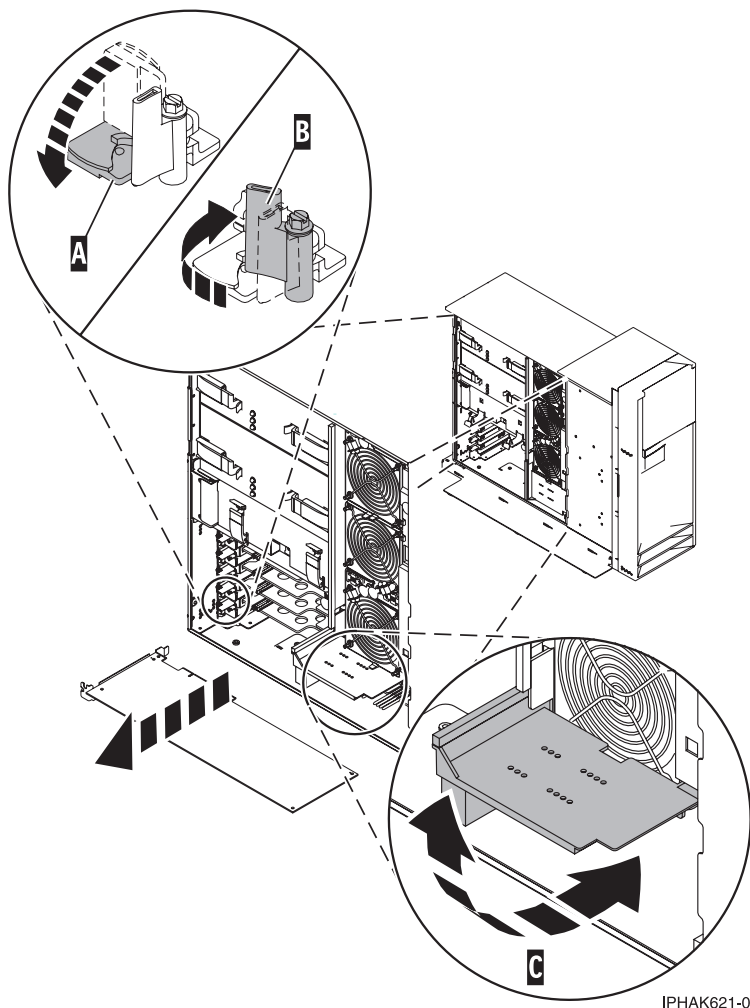
**Note:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

- b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
7. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in figure Figure 43 on page 65 or Figure 44 on page 66. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.



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Figure 43. PCI adapter replaced in the rack-mounted system unit



IPHAK621-0

Figure 44. PCI adapter replaced in the stand-alone system unit

8. Connect any adapter cables.
9. 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
10. Replace or close the covers.
11. On a rack-mounted server, close the rear rack door.
12. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted server. If you are servicing a stand-alone server, continue to the next step.

### Replace model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power off

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

The following procedure describes the replacement of PCI adapters with the system power off. You must have already completed the procedure "Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters with the system power off" on page 50.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

To replace a PCI adapter with the system power off, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. If necessary, remove the adapter from the antistatic package.

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

3. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
4. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

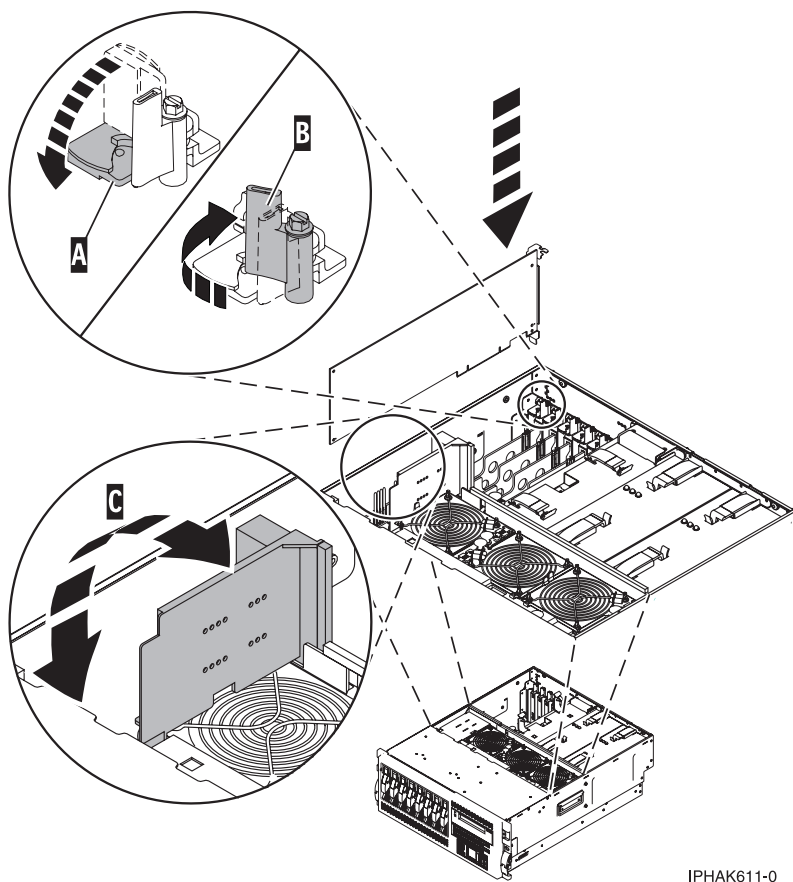
5. If you are replacing a short adapter, continue to the next step.

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 Figure 45 on page 68 or Figure 46 on page 69.

**Note:** The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.

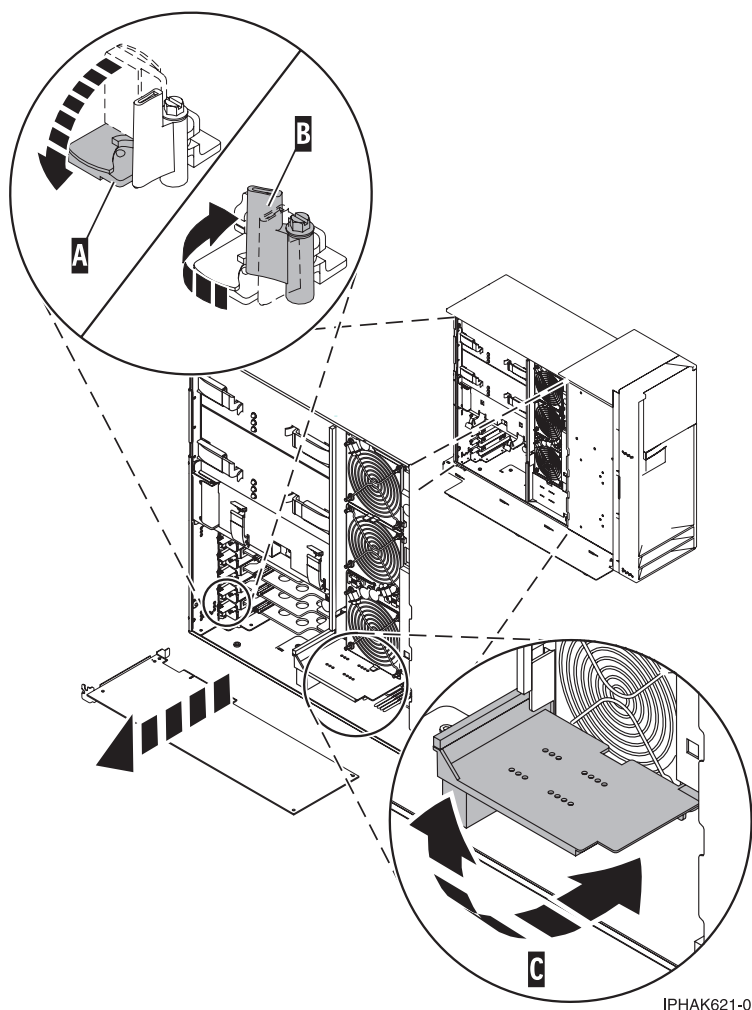
- b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
6. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in figure Figure 45 on page 68 or Figure 46 on page 69. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.



IPHAK611-0

Figure 45. PCI adapter replaced in the rack-mounted system unit






IPHA621-0

Figure 46. PCI adapter replaced in the stand-alone system unit

7. Connect the adapter cables.
8. If you are servicing a rack-mounted system unit, route the cables through the cable-management arm.
9. Replace or close the covers.
10. Reconnect the power source to the system.
11. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
12. On a rack-mounted system, close the rear rack door.
13. "Start the system or logical partition" on page 398.
14. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Model 55x, 720, or attached expansion-unit, PCI adapters

You might need to remove, replace, or install PCI adapters. Use the procedures in this section to perform these tasks.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

**Important:**

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## **Install model 55x, 720, or attached expansion-unit, PCI adapters**

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

### **Install model 55x, 720, or attached expansion-unit, PCI adapters with system power on in AIX**

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

If the system is partitioned, see Partitioning for AIX to learn more about working in partitions, then return here to continue the procedure.

To install a PCI adapter with the system power on in AIX, do the following:

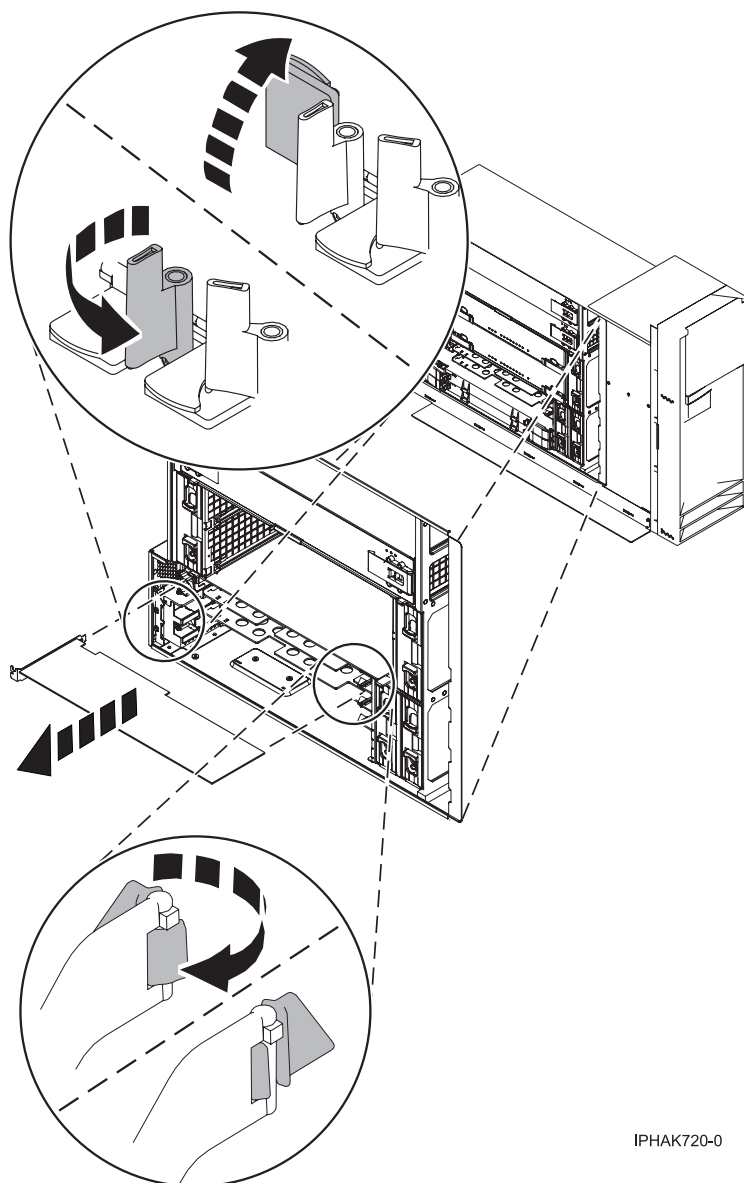
1. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.

4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
5. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
6. If necessary, remove the adapter expansion slot shield.
7. If necessary, remove the adapter from the antistatic package.

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

8. Place the adapter, component-side up, on a flat, antistatic surface.
9. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
10. Refer to “PCI hot-plug manager access for AIX” on page 327, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
11. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
12. Select the appropriate empty PCI slot from the ones listed on the screen, and press Enter.
13. Rotate the adapter locking latches counterclockwise as shown in Figure 47 on page 72 or Figure 48 on page 73.
14. Lift the black tab attached to the adapter retainer assembly, and keep the black tab in a vertical position.
15. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instruction in “Remove model 285, 515, 52x, or attached expansion-unit, PCI adapters” on page 39 and then return here.





IPHAK720-0

*Figure 48. PCI adapter or filler plate removed from the stand-alone system unit*

16. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See "Component LEDs" on page 329.
17. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
18. Press the adapter firmly into its connector.
19. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 49 on page 74 or Figure 50 on page 75.

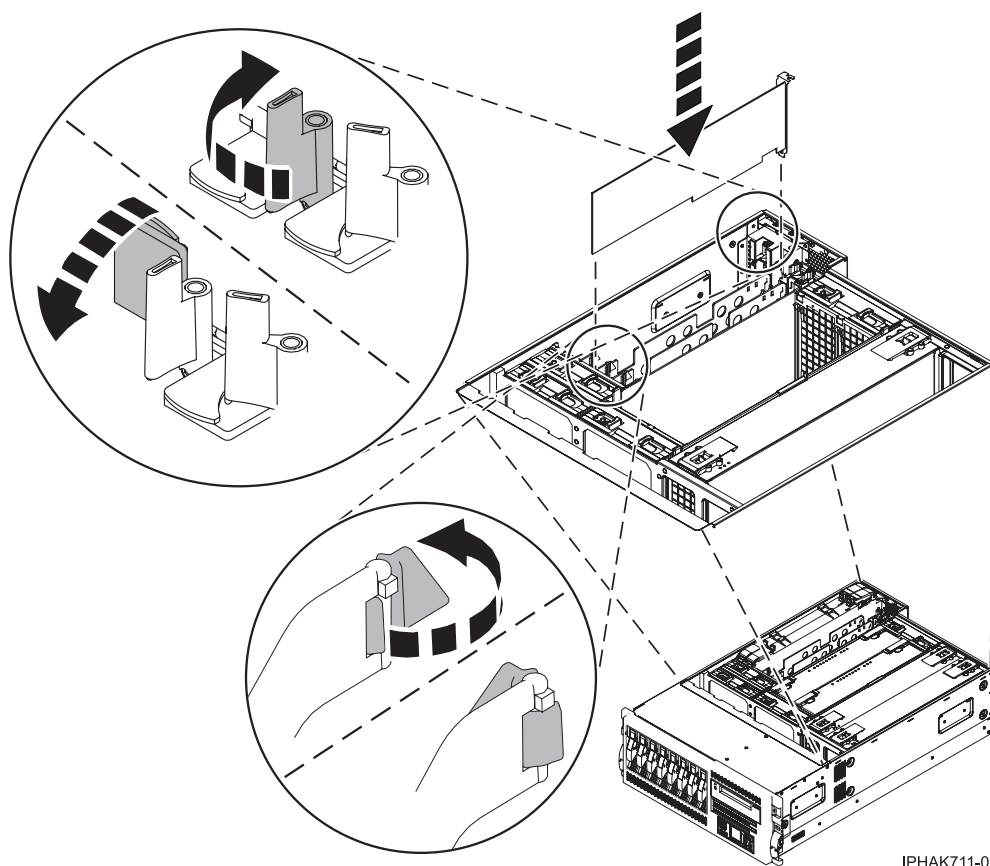
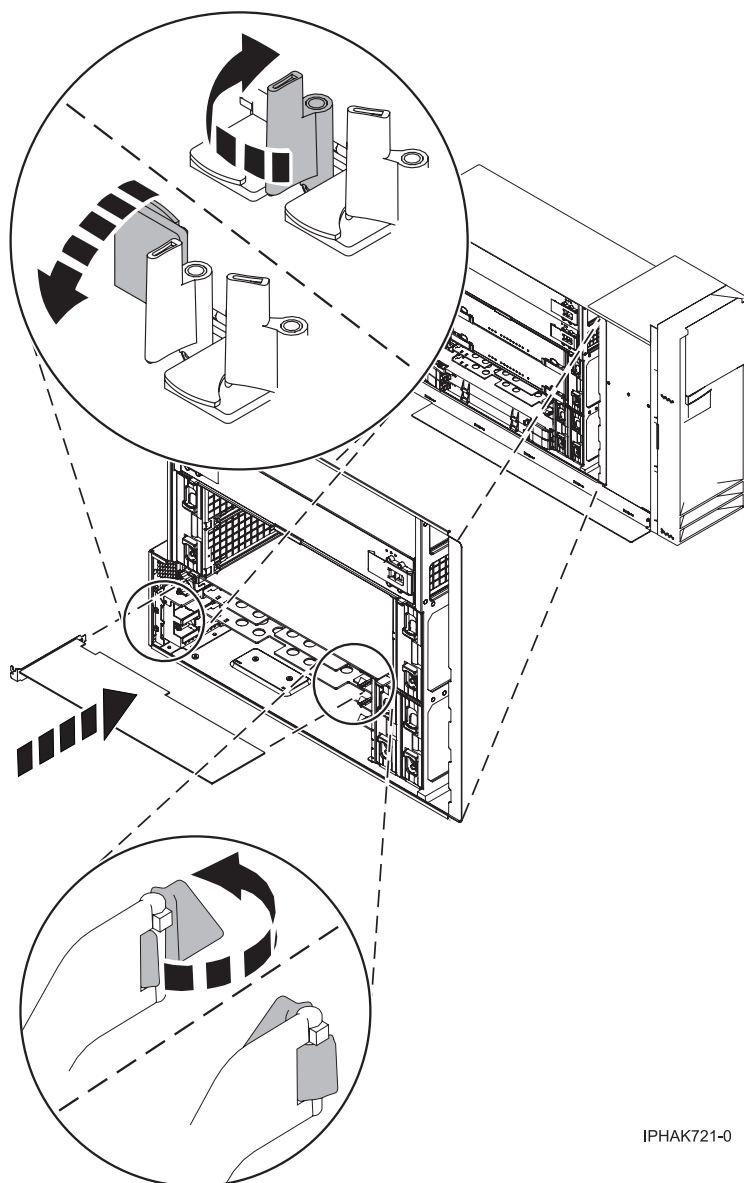


Figure 49. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 50. PCI adapter replaced in the stand-alone system unit

20. Connect any adapter cables.
21. Replace or close the covers.
22. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
23. On a rack-mounted system, close the rear rack door.
24. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

### **Install model 55x, 720, or attached expansion-unit, PCI adapters with system power on in i5/OS**

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If the system is partitioned, see Installing new hardware for i5/OS logical partitions before installing a new PCI adapter and then return here to continue the procedure.



If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Important:**

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To install a PCI adapter with the system power on in i5/OS, do the following:

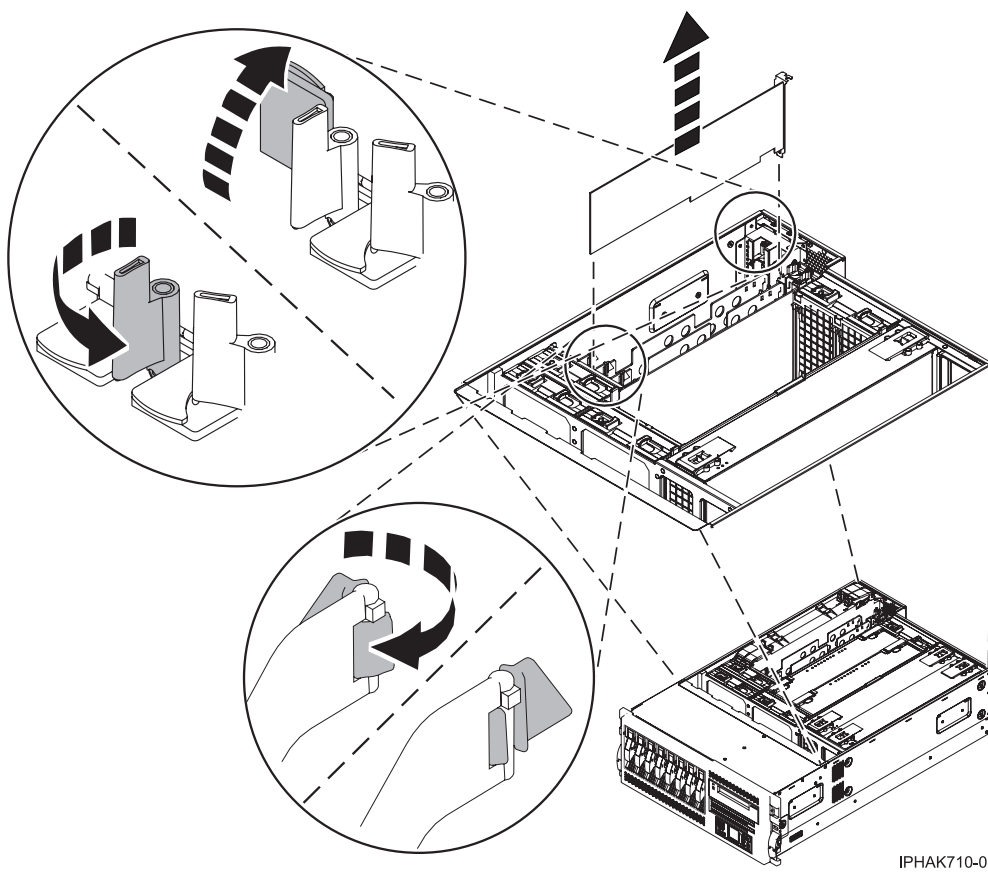
1. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.



- b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
    - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
    - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
    - “Open the model 0595, 5095, or D20 service access cover” on page 392
5. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
6. If necessary, remove the adapter expansion slot shield.
7. If necessary, remove the adapter from the antistatic package.

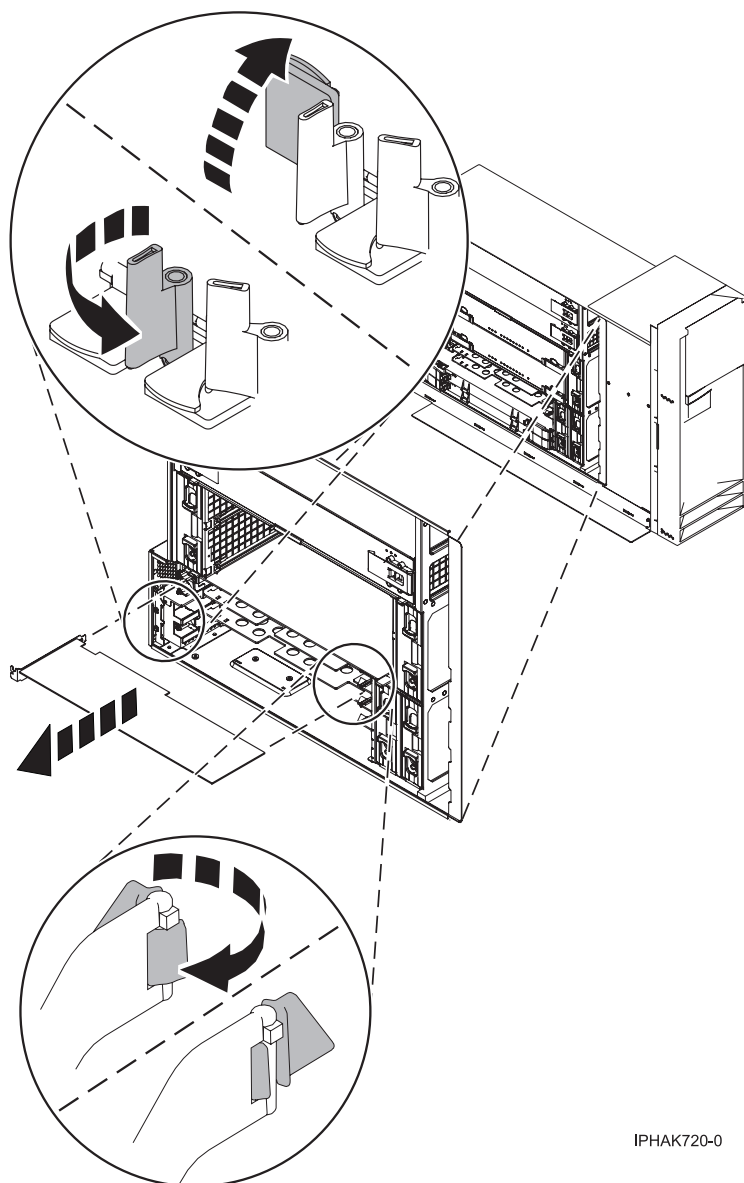
**Attention:** Avoid touching the components and gold-edge connectors on the adapter.

8. Place the adapter, component-side up, on a flat, antistatic surface.
9. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
10. Type **strsst** on the command line of the Main Menu and then press Enter.
11. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
12. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
13. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
14. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
15. Type **9** (Hardware contained within package) in the *System Unit* or *Expansion Unit* field of the unit where you are replacing the card. Press Enter.
16. Select the option to **Include empty positions**.
17. Select **Concurrent Maintenance** on the card position where you want to replace the card and then press Enter.
18. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
19. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
20. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 51 on page 78 or Figure 52 on page 79.
21. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
22. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instruction in “Remove model 55x, 720, or attached expansion-unit, PCI adapters” on page 93 and then return here.



IPHAK710-0

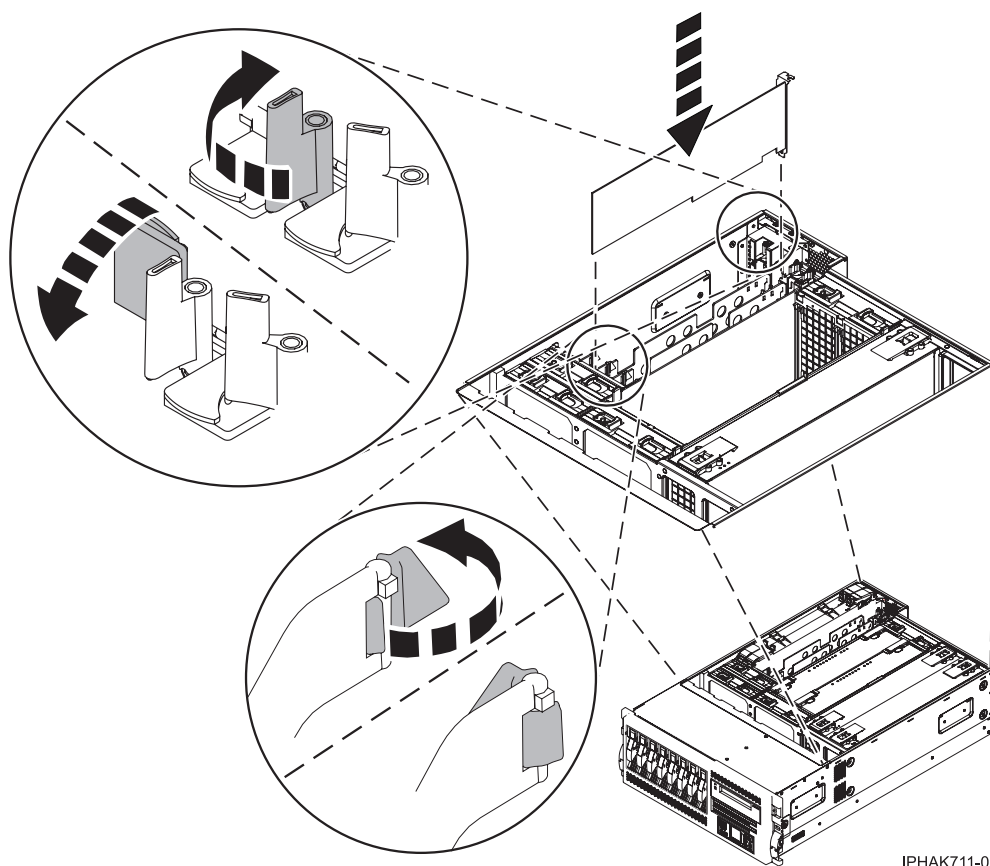
Figure 51. PCI adapter or filler plate removed from the rack-mounted system unit



IPHAK720-0

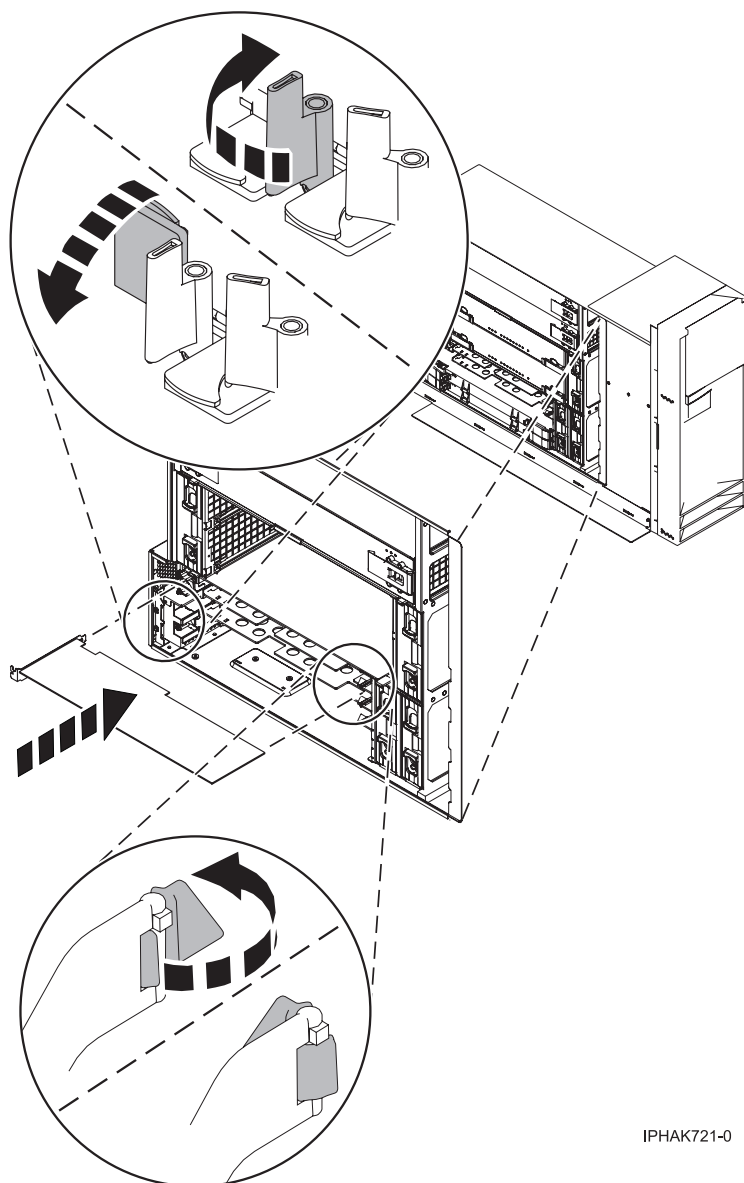
*Figure 52. PCI adapter or filler plate removed from the stand-alone system unit*

23. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
24. Press the adapter firmly into its connector.
25. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 53 on page 80 or Figure 54 on page 81.



IPHAK711-0

Figure 53. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 54. PCI adapter replaced in the stand-alone system unit

26. Connect any adapter cables.
27. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
28. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
29. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
30. Replace or close the covers.
31. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
32. On a rack-mounted system, close the rear rack door.
33. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Install model 55x, 720, or attached expansion-unit, PCI adapter with system power on in Linux

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If the system is partitioned, see Partitioning for Linux to learn more about working in partitions, then return here to continue the procedure.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

To install a PCI adapter with the system power on in Linux, do the following:

1. Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 333.
2. “Verify that the Linux, hot-plug PCI tools are installed” on page 334.
3. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
4. Perform the prerequisite tasks described in “Before you begin” on page 336.
5. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
6. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392

7. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
8. If necessary, remove the adapter expansion slot shield.
9. If necessary, remove the adapter from the antistatic package.

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

10. Place the adapter, component-side up, on a flat, antistatic surface.
11. Log in to the system console as the root user.
12. Run the lsslot tool to list the hot-plug PCI slots that are available in the server or partition:

```
lsslot -c pci -a
```

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

# Slot	Description	Device(s)
U7879.001.DQD014E-P1-C1	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C4	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C5	PCI-X capable, 64 bit, 133MHz slot	Empty

Select the appropriate empty PCI slot from the ones listed by the command.

13. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 55 on page 84 or Figure 56 on page 85.
14. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
15. Ensure the slot is empty. Remove the adapter filler plate if one is present.

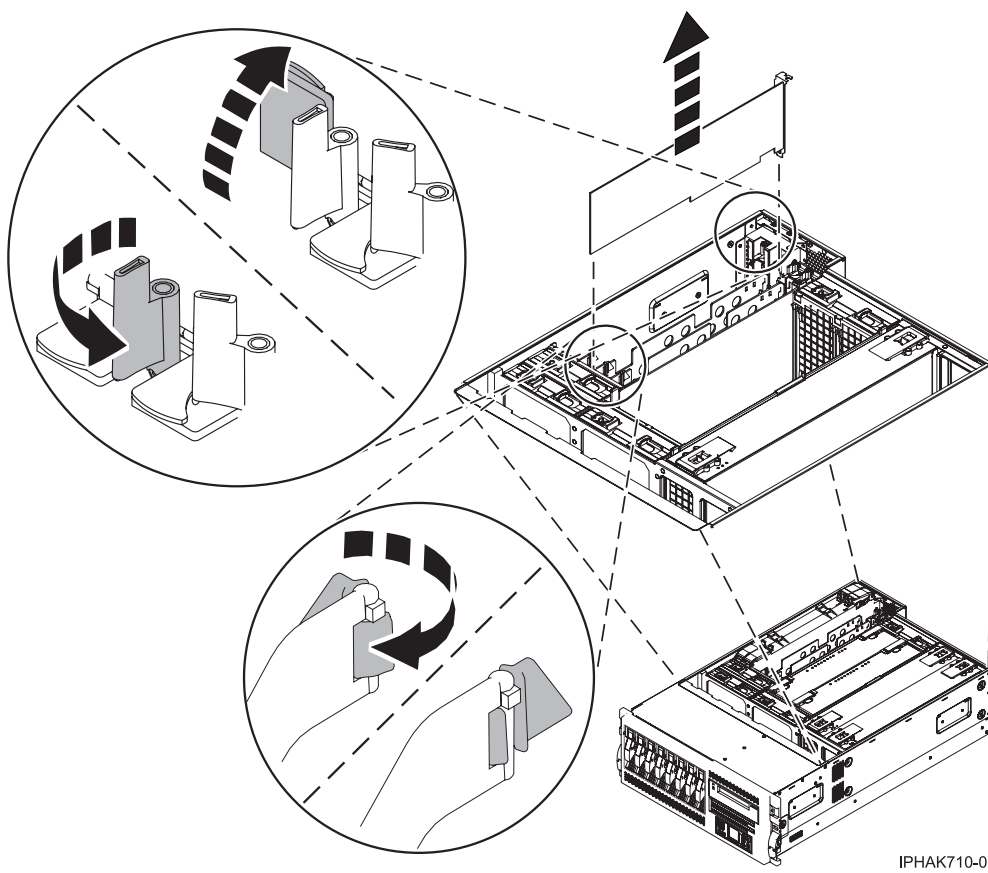
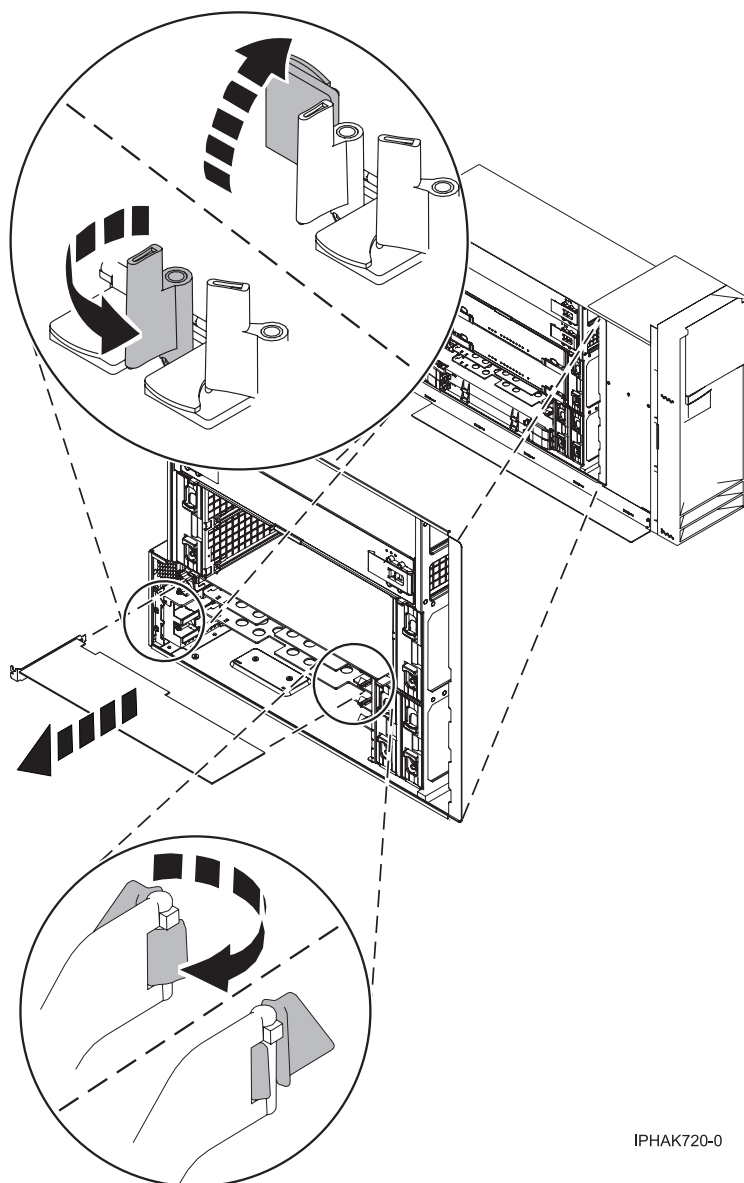


Figure 55. PCI adapter or filler plate removed from the rack-mounted system unit





IPHAK720-0

Figure 56. PCI adapter or filler plate removed from the stand-alone system unit

16. Run the `drslot_chrp_pci` command to enable an adapter to be installed. For example, to install an adapter into PCI slot U7879.001.DQD014E-P1-C3, enter the following command:

```
drslot_chrp_pci -a -s U7879.001.DQD014E-P1-C3
```

The following displays:

The visual indicator for the specified PCI slot has been set to the identify state. Press Enter to continue or enter x to exit.

17. Press Enter.

The following displays:

The visual indicator for the specified PCI slot has been set to the action state. Insert the PCI card into the identified slot, connect any devices to be configured and press Enter to continue. Enter x to exit.

18. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
19. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

20. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 57 or Figure 58 on page 87.

21. Connect any adapter cables.

22. 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

23. If you are servicing a rack-mounted system, route the cables through the cable-management arm.

24. Replace or close the covers.

25. On a rack-mounted system, close the rear rack door.

26. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.

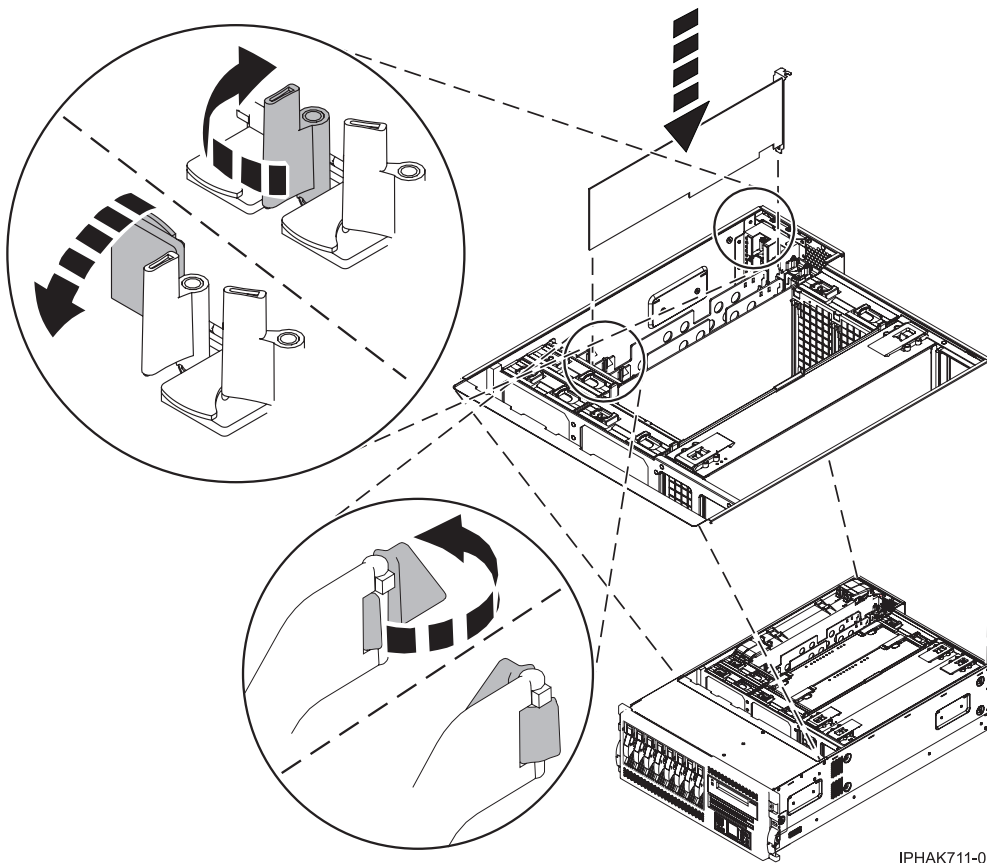
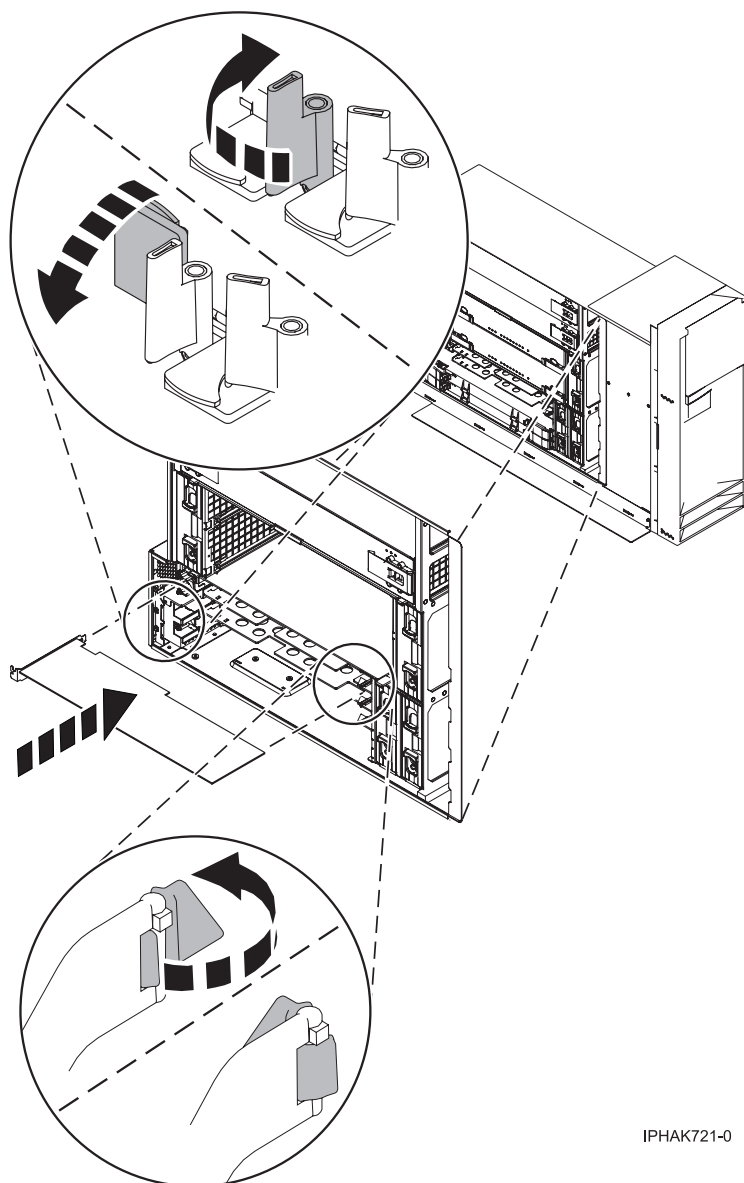


Figure 57. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 58. PCI adapter replaced in the stand-alone system unit

### Install model 55x, 720, or attached expansion-unit, PCI adapters with the system power off

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, select the appropriate information from the following list to learn more about working in a partitioned environment, then return here:

- Partitioning for AIX
- Installing new hardware for i5/OS logical partitions
- Partitioning for Linux

To install a PCI adapter with the system power off, do the following:

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
2. Determine in which slot to place the PCI adapter by doing the following:
  - Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
  - Determine if the adapter will be placed in the base system unit or an expansion unit.
    - If the adapter is to be placed into the base system unit, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that does not contain PCI adapter cassettes, continue with this procedure by going to the next numbered step.
    - If the adapter is to be placed into an expansion unit that contains PCI adapter cassettes, go to the procedures for adapters in adapter cassettes. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
3. Perform the prerequisite tasks described in “Before you begin” on page 336.
4. “Stop the system or logical partition” on page 399.
5. Disconnect the power source from the system by unplugging the system.

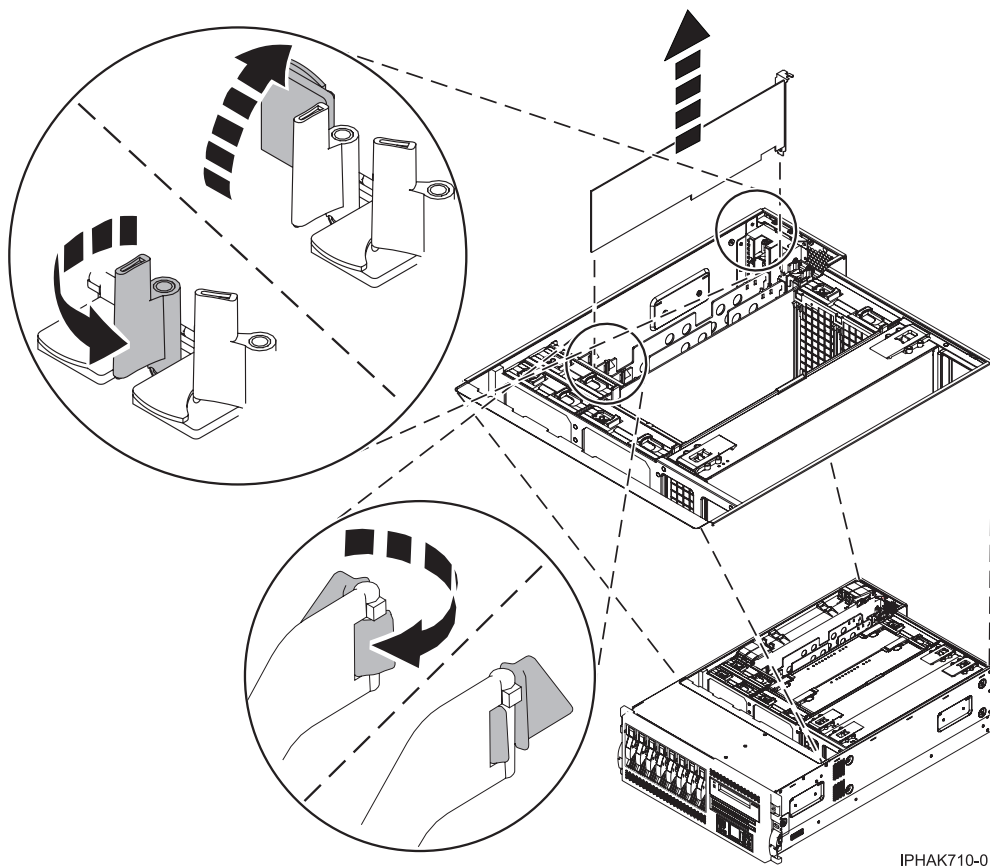
**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to step 7.
  - If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
  - Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
7. If you are installing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388

8. If necessary, remove the adapter expansion slot shield.
9. If necessary, remove the adapter from the antistatic package.

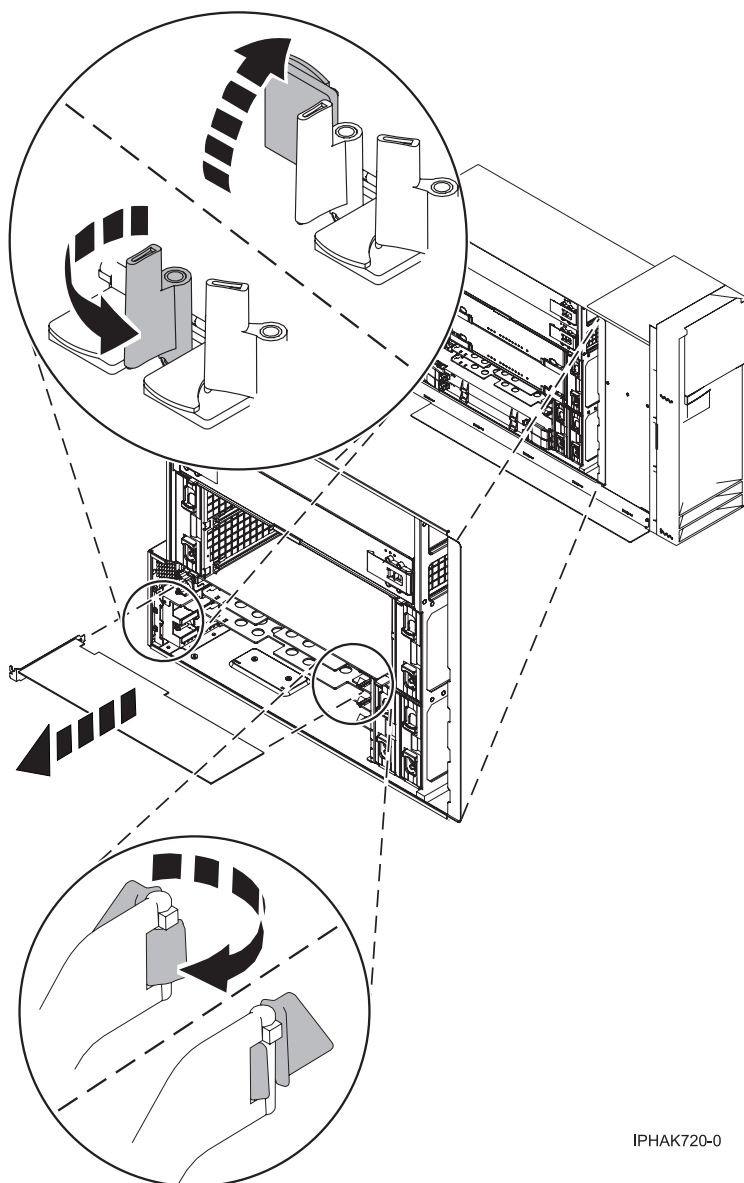
**Attention:** Avoid touching the components and gold-edge connectors on the adapter.

10. Place the adapter, component-side up, on a flat, antistatic surface.
11. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
12. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 59 or Figure 60 on page 90.
13. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
14. Ensure the slot is empty. Remove the adapter filler plate if one is present. If an adapter is present in the slot you want to use, see the instructions in "Remove model 55x, 720, or attached expansion-unit, PCI adapters" on page 93 and then return here.



IPHA710-0

Figure 59. PCI adapter or filler plate removed from the rack-mounted system unit



IPHA720-0

*Figure 60. PCI adapter or filler plate removed from the stand-alone system unit*

15. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
16. Press the adapter firmly into its connector.
17. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 61 on page 91 or Figure 62 on page 92.

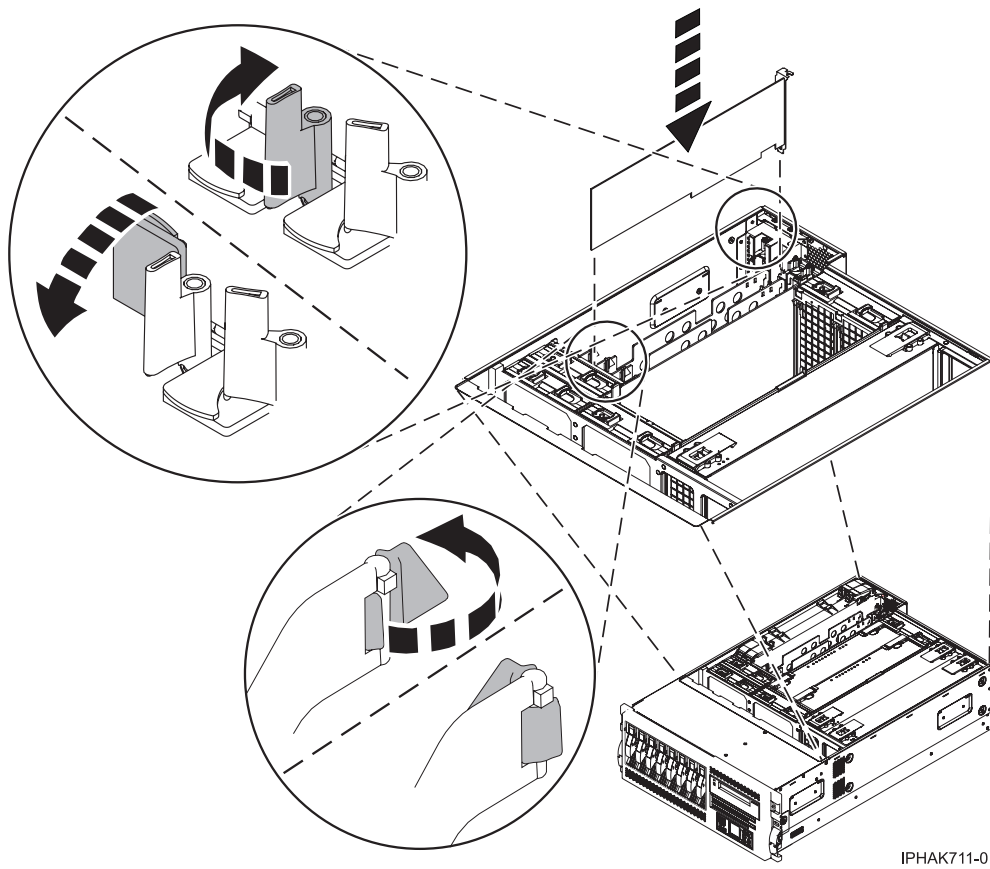
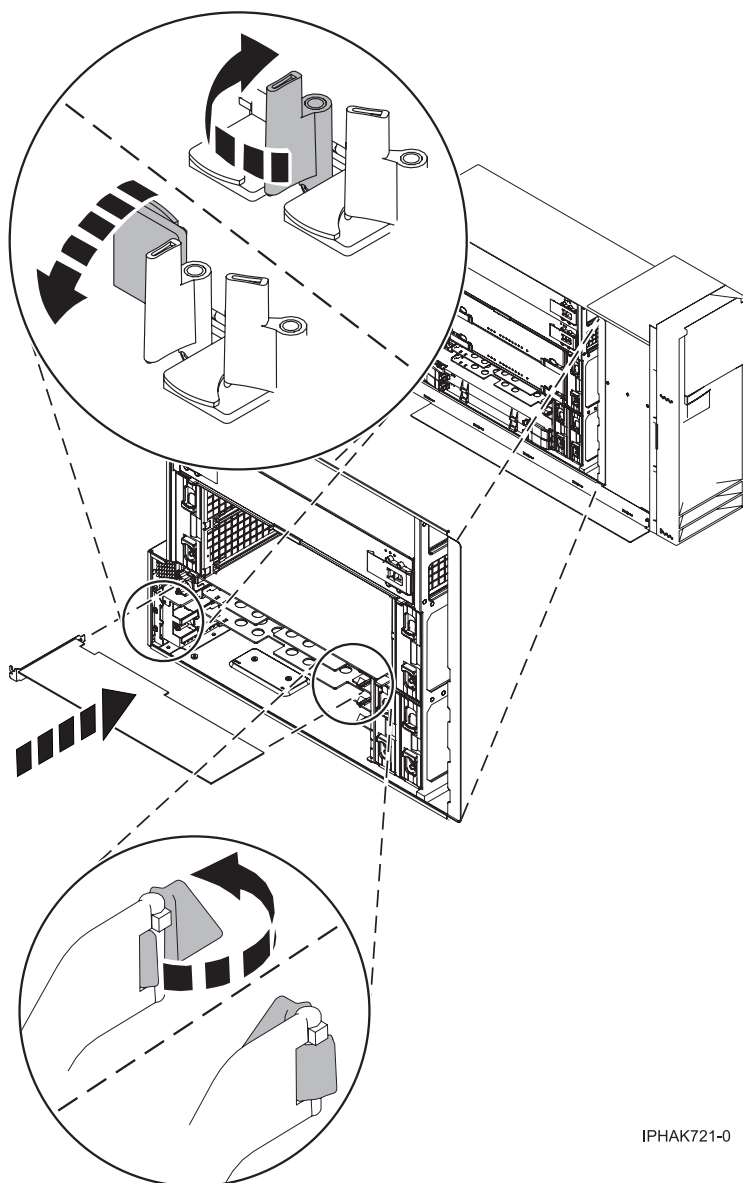


Figure 61. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

*Figure 62. PCI adapter replaced in the stand-alone system unit*

18. Connect any adapter cables.
19. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
20. Replace or close the covers.
21. On a rack-mounted system, close the rear rack door.
22. If you are servicing a rack-mounted system see "Place the rack-mounted system or expansion unit in the operating position" on page 396. If you are servicing a stand-alone system, continue to the next step.
23. Reconnect the power source to the system.
24. "Start the system or logical partition" on page 398.
25. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.



## Remove model 55x, 720, or attached expansion-unit, PCI adapters

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## Remove model 55x, 720, or attached expansion-unit PCI adapters with the system power on in AIX

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

To remove a failing adapter and replace it with the same adapter, see “Remove and replace model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in AIX” on page 107. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, then install the adapter as described in “Install model 55x, 720, or attached expansion-unit, PCI adapters with system power on in AIX” on page 70.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

**Note:** Procedures performed on a PCI adapter with the system power on in AIX, 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 a PCI adapter with the system power on in AIX, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.

- b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
  - c. Remove or open the service access cover as follows:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
    - “Open the model 0595, 5095, or D20 service access cover” on page 392
- For all other rack-mounted expansion units, follow these steps:
  - a. Open the back rack door.
  - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
    - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
    - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
    - “Open the model 0595, 5095, or D20 service access cover” on page 392
5. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
6. Determine which adapters you plan to remove.
7. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.
8. Ensure that any processes or applications that might use the adapter are stopped.
9. Follow these steps to place the adapter in the action state using the PCI Hot-Plug Manager:
  - a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
  - b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
  - c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
  - d. At the Task Selection list, select **PCI Hot Plug Manager**.
  - e. Select **Unconfigure a Device**, then press Enter.
  - f. Press F4 (or Esc +4) to display the **Device Names** menu.
  - g. Select the adapter you are removing in the **Device Names** menu.
  - h. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.
  - i. 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.
  - j. Press F4 (or Esc +4) twice to return to the Hot Plug Manager menu.
  - k. Select **replace/remove PCI Hot Plug adapter**.
  - l. Select the slot that has the device to be removed from the system.
  - m. Select **remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
  - n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
10. Label, and then disconnect all cables attached to the adapter you plan to remove.
11. Rotate the adapter locking latch **A** counterclockwise.
12. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.

13. 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.

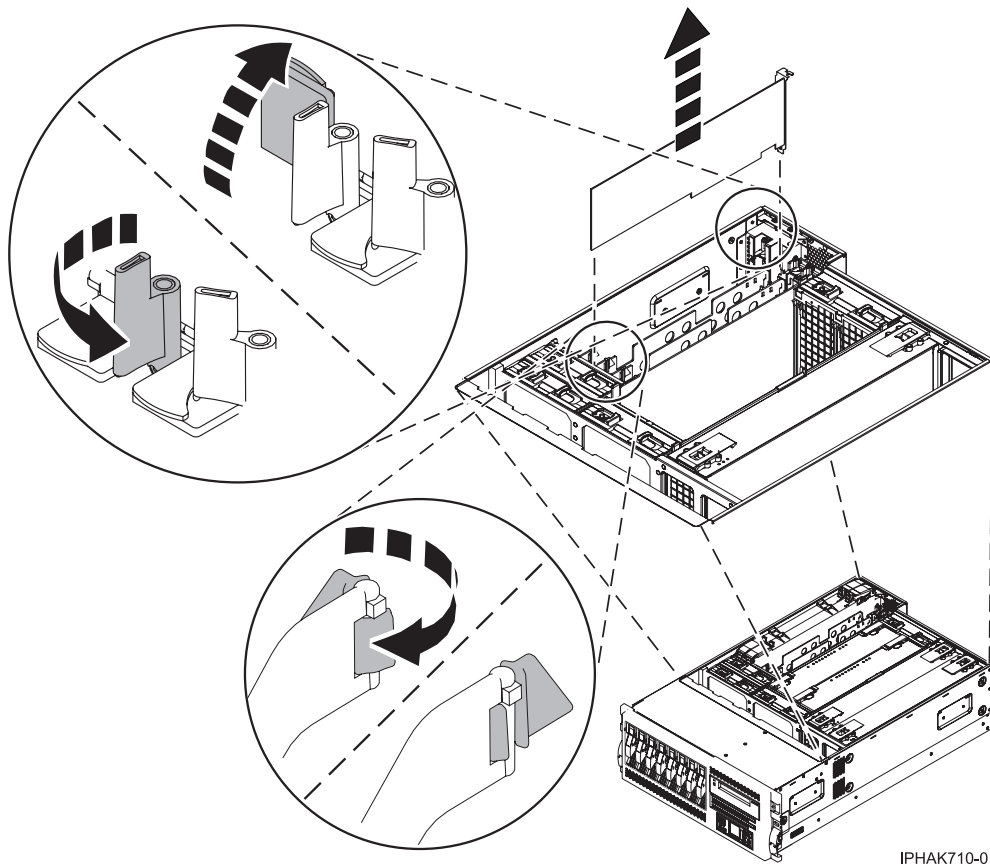
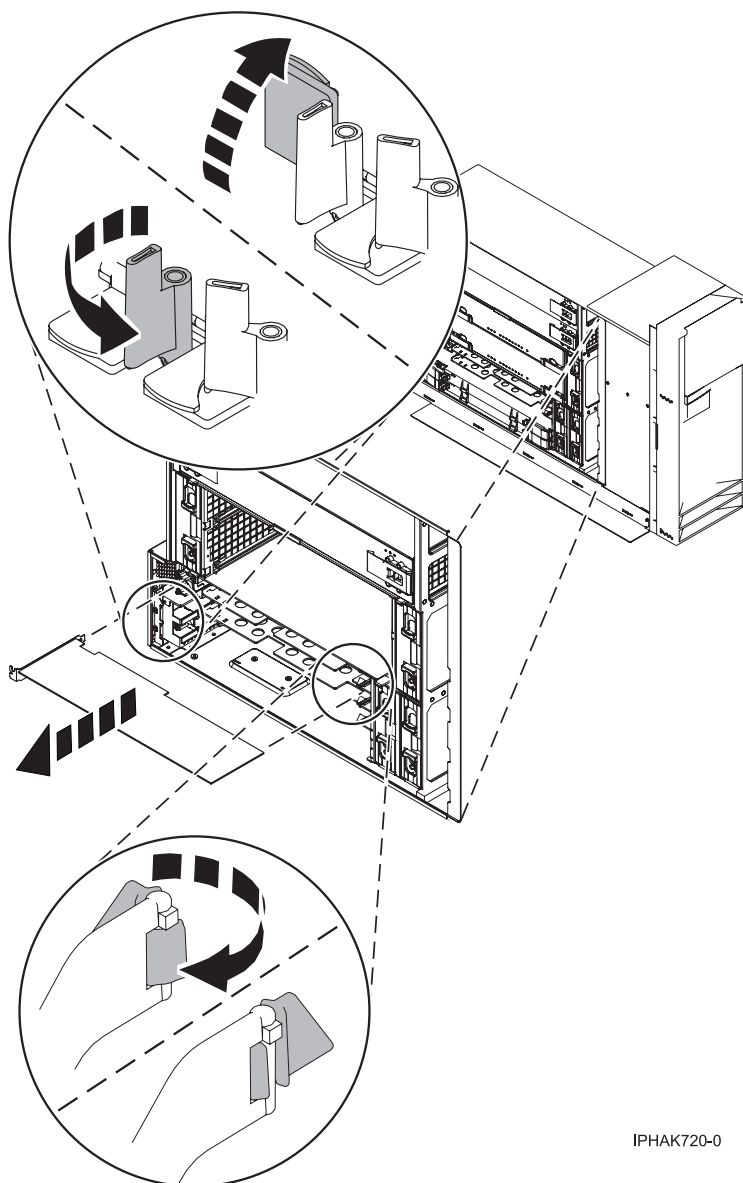


Figure 63. PCI adapter removed from the rack-mounted system unit



IPHAK720-0

Figure 64. PCI adapter removed from the stand-alone system unit

14. If you plan to install another adapter into the vacated slot, go to "Install model 285, 52x, or attached expansion-unit, PCI adapters with system power on in AIX" on page 16; otherwise, continue with the next step.
15. Seal the expansion slot using an expansion-slot cover.
16. Lower the plastic retainer seat over the PCI adapter faceplate.
17. Rotate the locking latch clockwise until it clicks into the locked position.
18. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the Command field at the top of the screen.
19. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 10 on page 94.  
OR  
If you do not have other adapters to remove, continue with the next step.
20. Press F10 to exit the Hot-Plug Manager.

21. Run the diag -a command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
22. Replace or close the covers.
23. On a rack-mounted system, close the rear rack door.
24. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
25. To replace the PCI adapter, see "Replace model 55x, 720, or attached expansion-unit, PCI adapters" on page 107.

## **Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in i5/OS**

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see "Remove a part using the Hardware Management Console" on page 411.

### **Important:**

- If the adapter is the load source IOA or the load source IOP, or any other storage IOA or IOP with critical DASD attached for the system or partition, follow the on-screen instructions when you use HSM to power down the IOP or IOA. Instructions to use functions 68 and 69 on the control panel will be included.
- If the adapter is the console IOA or the console IOP for the system or partition, you must perform the maintenance from an i5/OS session connected through a different IOA or IOP, or you must power down the partition to perform maintenance.
- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see "Updating the worldwide port name for a new 2766, 2787, or 280E IOA" on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To remove a PCI adapter with the system power on in i5/OS, do the following:

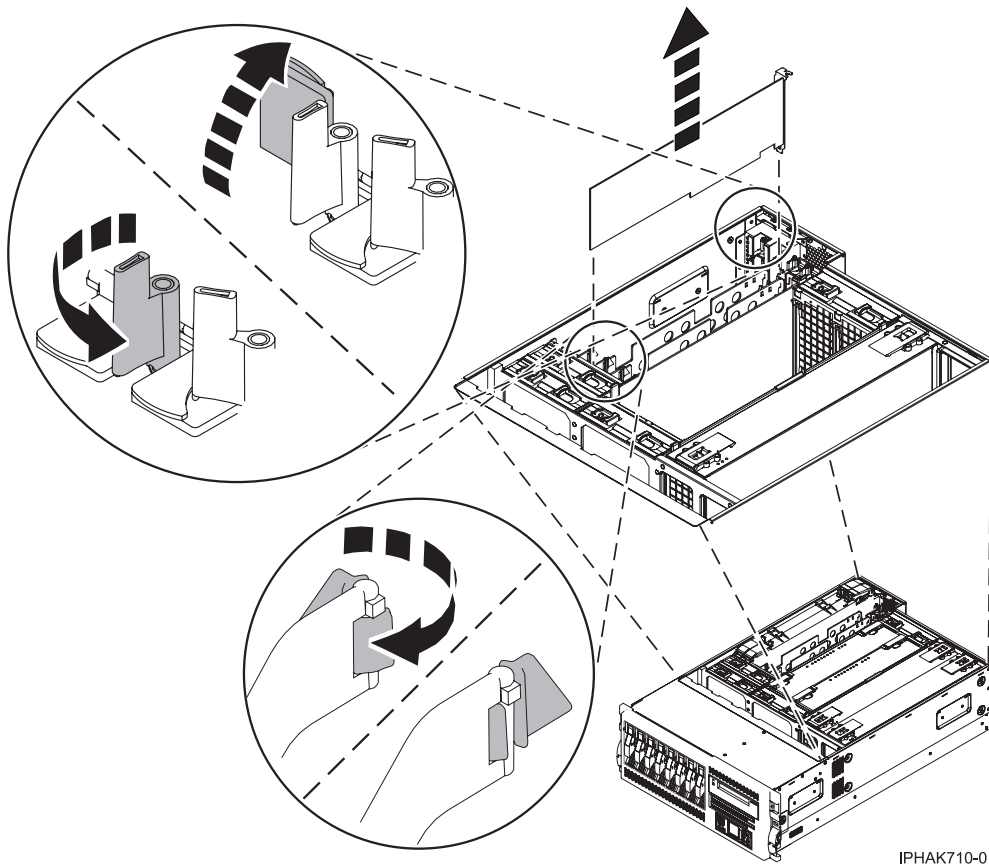
1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 326 and "Handling static-sensitive devices" on page 327.
3. If you are removing a failing PCI adapter, see "Identify a failing part" on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  -

If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.

- Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
5. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
    - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
    - “Remove the back door and cover from the 5095 expansion unit” on page 388
  6. Type **strsst** on the command line of the Main Menu and press Enter.
  7. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
  8. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
  9. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
  10. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
  11. 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.
  12. Select the option to **Include empty positions**.
  13. Select **Concurrent Maintenance** on the card position where you want to remove the card and then press Enter.
  14. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to remove the adapter.
  15. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
  16. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
  17. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power off complete
  18. Label, and then disconnect all cables attached to the adapter you plan to remove.
  19. Record the slot number and location of each adapter being removed.

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

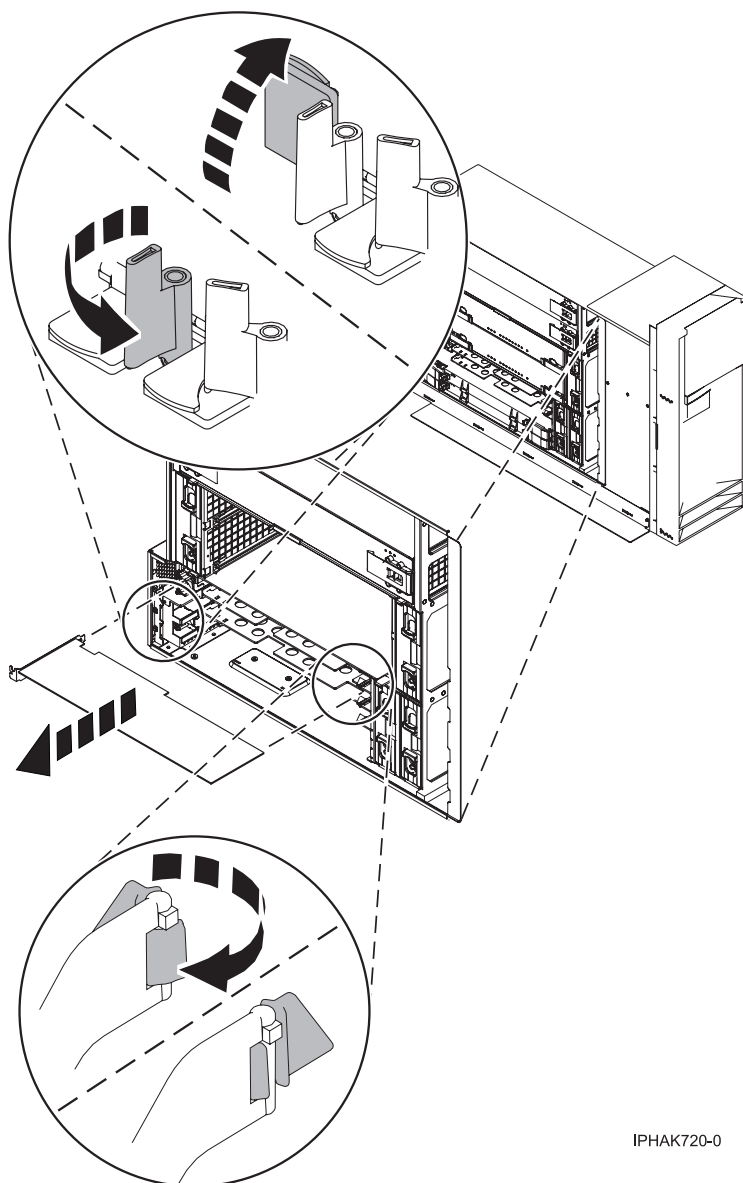
20. Rotate the adapter locking latch **A** counterclockwise.
21. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
22. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.



IPHA710-0

*Figure 65. PCI adapter removed from the rack-mounted system unit*





IPHAK720-0

Figure 66. PCI adapter removed from the stand-alone system unit

23. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
24. If you plan to install another adapter into the vacated slot, go to “Install model 55x, 720, or attached expansion-unit, PCI adapters with system power on in i5/OS” on page 75; otherwise, continue with the next step.
25. Seal the expansion slot using an expansion-slot cover.
26. Replace or close the covers.
27. On a rack-mounted system, close the rear rack door.
28. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
29. To replace the PCI adapter, see “Replace model 55x, 720, or attached expansion-unit, PCI adapters” on page 107.



## Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in Linux

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

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

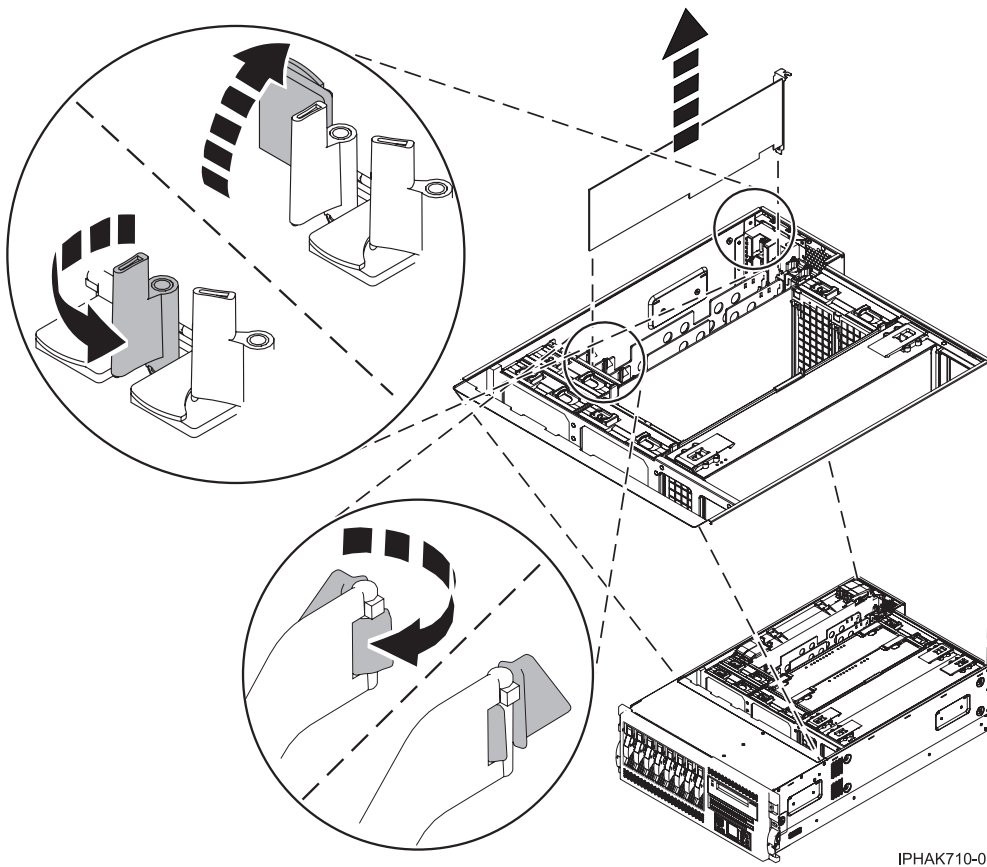
1. Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 333.
2. “Verify that the Linux, hot-plug PCI tools are installed” on page 334.
3. Perform the prerequisite tasks described in “Before you begin” on page 336.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
6. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
7. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
8. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
9. Record the slot number and location of each adapter being removed.

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

10. Label, and then disconnect all cables attached to the adapter you plan to remove.

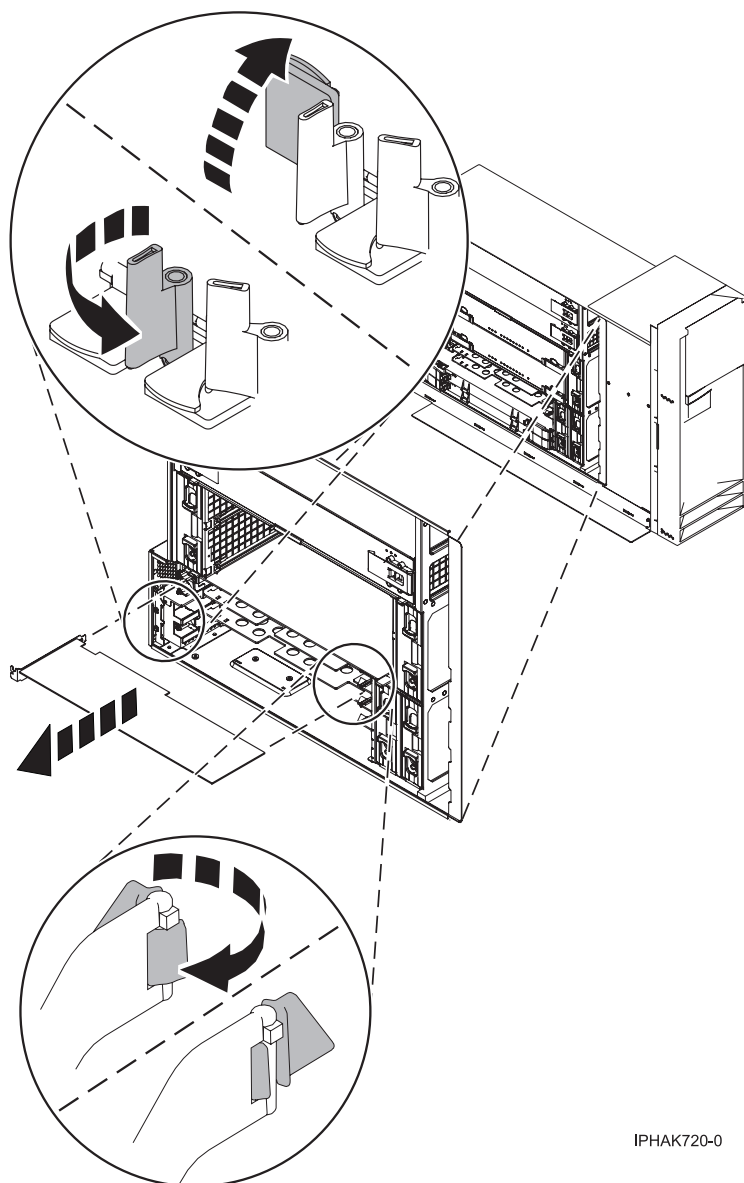
**Note:** Before performing a PCI hot-plug removal of storage devices, ensure file systems on those devices are unmounted.

11. Run the `drslot_chrp_pci` command to enable an 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`  
Follow the instructions on the display to complete the task.
12. Rotate the adapter locking latch **A** counterclockwise as shown in Figure 67 or Figure 68 on page 103.
13. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
14. 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.



IPHA710-0

Figure 67. PCI adapter removed from the rack-mounted system unit



IPHAK720-0

Figure 68. PCI adapter removed from the stand-alone system unit

15. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
16. If you plan to install another adapter into the vacated slot, go to “Replace a model 55x, 720, or attached expansion-unit, PCI adapter with the system power on in Linux” on page 117; otherwise, continue with the next step.
17. Seal the expansion slot using an expansion-slot cover.
18. Replace or close the covers.
19. Reconnect the power source to the system.
20. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
21. On a rack-mounted system, close the rear rack door.
22. “Start the system or logical partition” on page 398.

23. To replace the PCI adapter, see “Replace model 55x, 720, or attached expansion-unit, PCI adapters” on page 107.

## **Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power off**

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

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

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. “Stop the system or logical partition” on page 399.
5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.
  - If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
  - Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
  - For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
    - a. Open the front rack door.
    - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
    - c. Remove or open the service access cover as follows:
      - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
  - For all other rack-mounted expansion units, follow these steps:
    - a. Open the back rack door.
    - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
      - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
      - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
      - “Open the model 0595, 5095, or D20 service access cover” on page 392
7. If you are removing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365

- “Remove the back door and cover from the 5095 expansion unit” on page 388
- Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
  - Record the slot number and location of each adapter being removed.

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

- Rotate the adapter locking latch **A** counterclockwise as shown in Figure 69 or Figure 70 on page 106.
- Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
- 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.

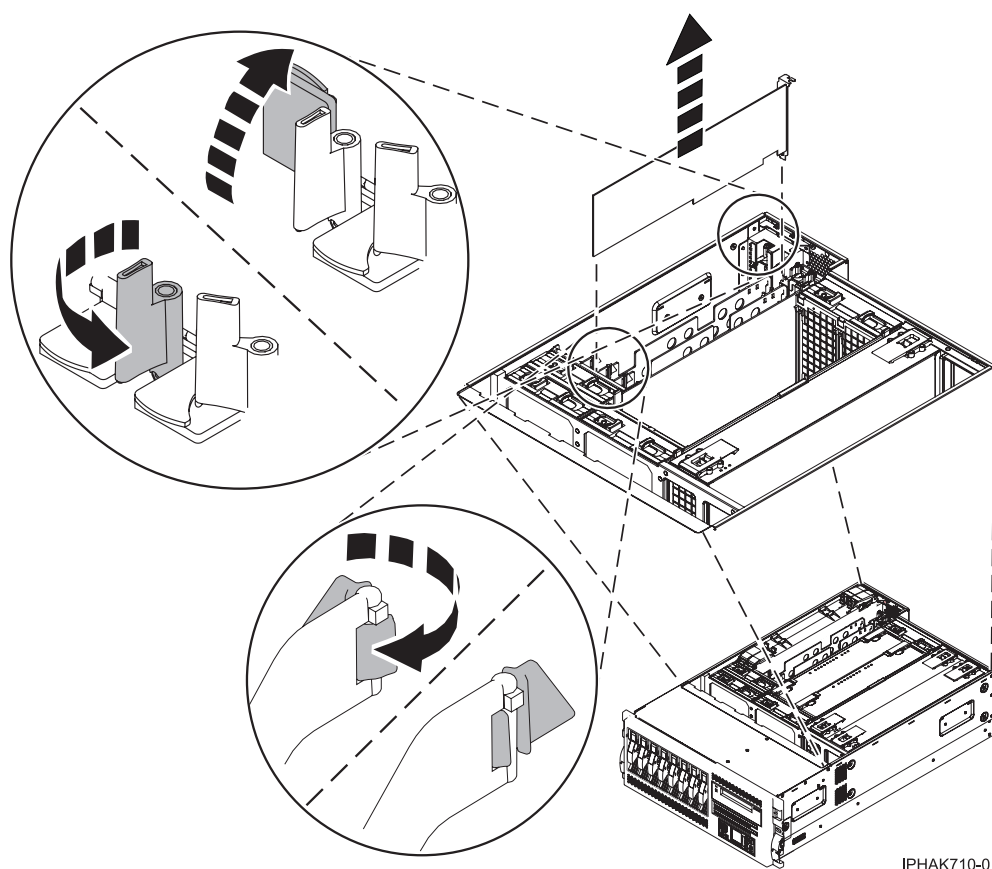
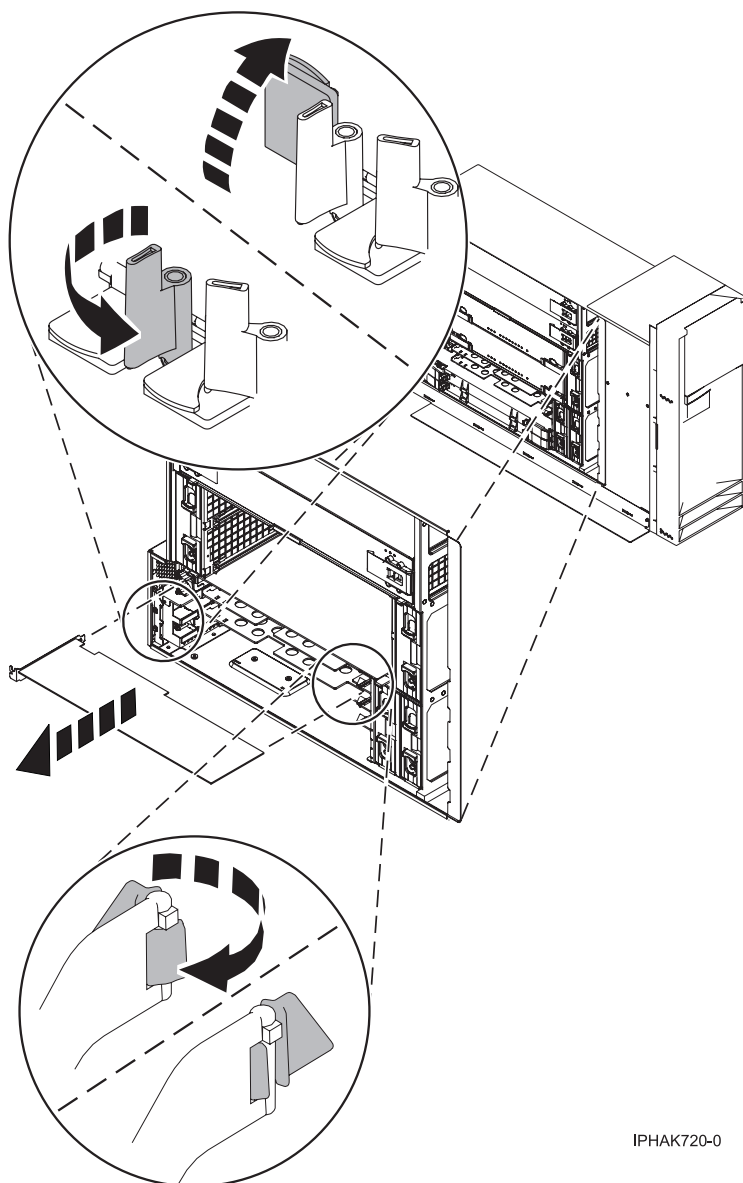


Figure 69. PCI adapter removed from the rack-mounted system unit



IPHAK720-0

Figure 70. PCI adapter removed from the stand-alone system unit

13. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
14. If you plan to install another adapter into the vacated slot, go to "Replace model 55x, 720, or attached expansion-unit, PCI adapters with the system power off" on page 120; otherwise, continue with the next step.
15. Seal the expansion slot using an expansion-slot cover.
16. Replace or close the covers.
17. Reconnect the power source to the system.
18. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
19. On a rack-mounted system, close the rear rack door.
20. "Start the system or logical partition" on page 398.

21. To replace the PCI adapter, see “Replace model 55x, 720, or attached expansion-unit, PCI adapters.”

## **Replace model 55x, 720, or attached expansion-unit, PCI adapters**

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

### **Remove and replace model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in AIX**

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

Read the following notes to determine if this is the correct procedure for the task to be performed.

#### **Note:**

1. If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.
2. Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.
3. If you plan to remove a failing adapter and leave the slot empty, see “Remove model 55x, 720, or attached expansion-unit PCI adapters with the system power on in AIX” on page 93.
4. This procedure should not be used to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in “Remove model 55x, 720, or attached expansion-unit PCI adapters with the system power on in AIX” on page 93, then install the new adapter as described in “Install model 55x, 720, or attached expansion-unit, PCI adapters with system power on in AIX” on page 70.
5. Procedures performed on a PCI adapter with the system power on in AIX, 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 PCI adapter with the system power on in AIX, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are removing or replacing a PCI adapter in a rack-mounted system or expansion unit, follow these steps. If you are servicing a stand-alone system, go to the next step.

#### **Note:**

- a. If you are placing an adapter in a model 5790 or D11, use the PCI adapter cassette procedures. See “Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes” on page 141.
- b. Installing, removing, or replacing a PCI adapter in a D10, 5791, or 5794 expansion unit is not a customer procedure. Contact your service provider.
- For the 55x system unit, the 0595, 5095, or D20 expansion unit, follow these steps:
  - a. Open the front rack door.
  - b. Place the system or expansion unit in the service position. See “Place the rack-mounted system or expansion unit in the service position” on page 392.
  - c. Remove or open the service access cover as follows:



- “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
- “Open the model 0595, 5095, or D20 service access cover” on page 392
- For all other rack-mounted expansion units, follow these steps:
  - a. Open the back rack door.
  - b. Remove the cover or covers. For instructions on removing covers, select the appropriate procedure from the following:
    - “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 386. These steps also apply to the 5294, 8294, and 9194 expansion units. When the cover is removed, remove the PCI adapter access plate.
    - “Remove the back cover from the 0588 expansion unit” on page 389. These steps also apply to the model 5088.
    - “Open the model 0595, 5095, or D20 service access cover” on page 392
- 5. If you are removing or replacing a PCI adapter in a stand-alone system or expansion unit, follow these steps:
  - “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365
  - “Remove the back door and cover from the 5095 expansion unit” on page 388
- 6. Determine which adapters you plan to remove.
- 7. Record the slot number and location of each adapter being removed.

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

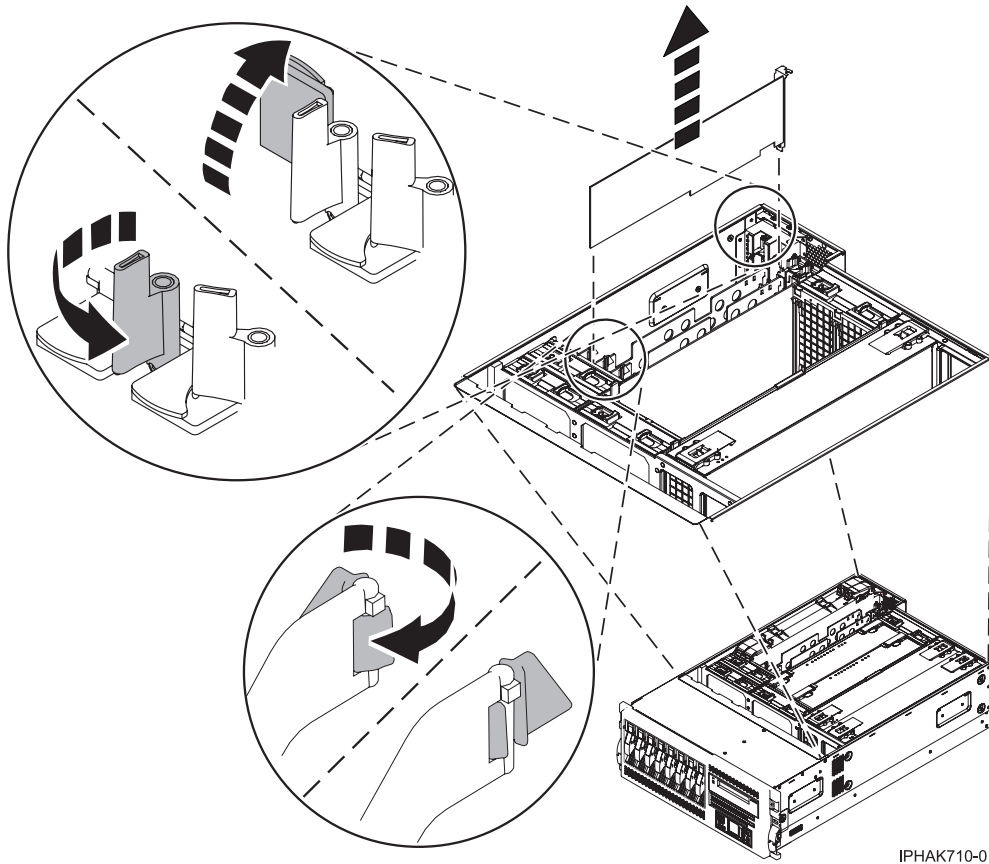
8. Ensure that any processes or applications that might use the adapter are stopped.
9. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
10. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
11. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
12. At the Task Selection list, select **PCI Hot Plug Manager**.
13. Select **Unconfigure a Device**, then press Enter.
14. Press F4 (or Esc +4) to display the **Device Names** menu.
15. Select the adapter you are removing in the **Device Names** menu.
16. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter.
17. 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.
18. Press F3 (or Esc +3) twice to return to the **Hot Plug Manager** menu.
19. Select **replace/remove PCI Hot Plug adapter**.
20. Select the slot that has the device to be removed from the system.
21. Select **replace**.

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

22. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
23. Label, and then disconnect all cables attached to the adapter you plan to remove.
24. Rotate the adapter locking latch **A** counterclockwise.

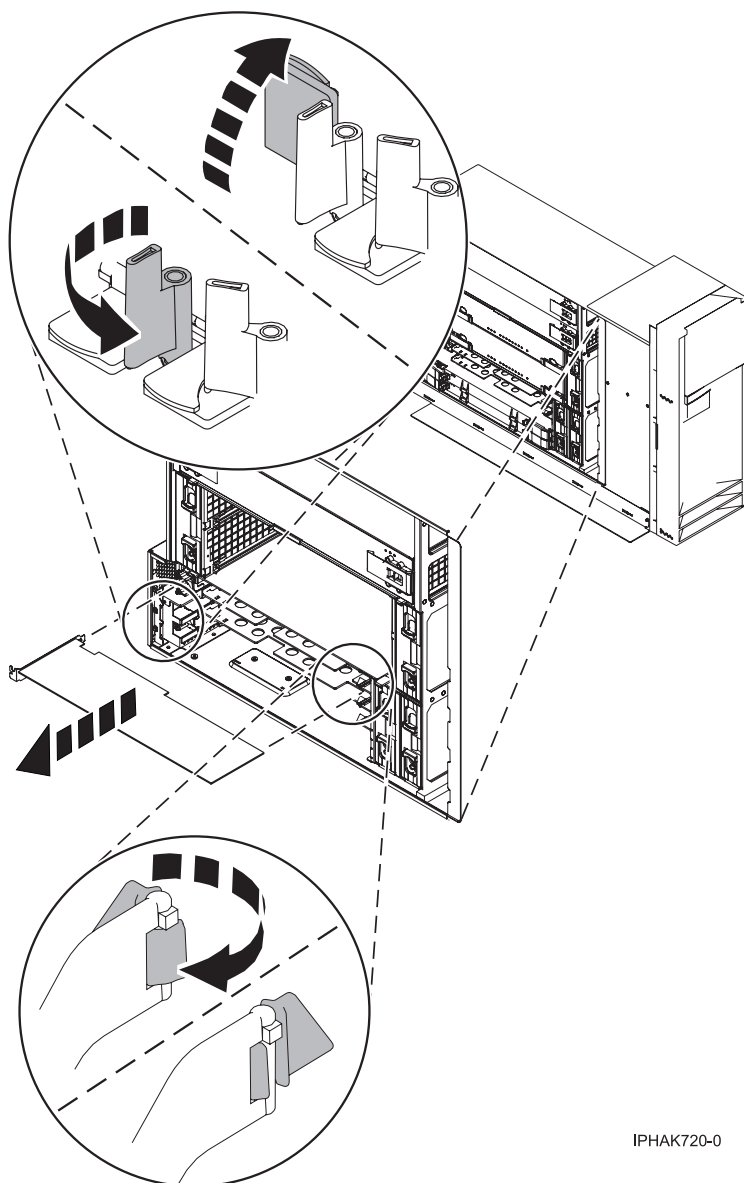


25. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
26. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.



IPHAK710-0

*Figure 71. PCI adapter removed from the rack-mounted system unit*



IPHAK720-0

Figure 72. PCI adapter removed from the stand-alone system unit

27. If necessary, remove the replacement adapter from the antistatic package.

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

28. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
29. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

30. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 73 on page 111 or Figure 74 on page 112.

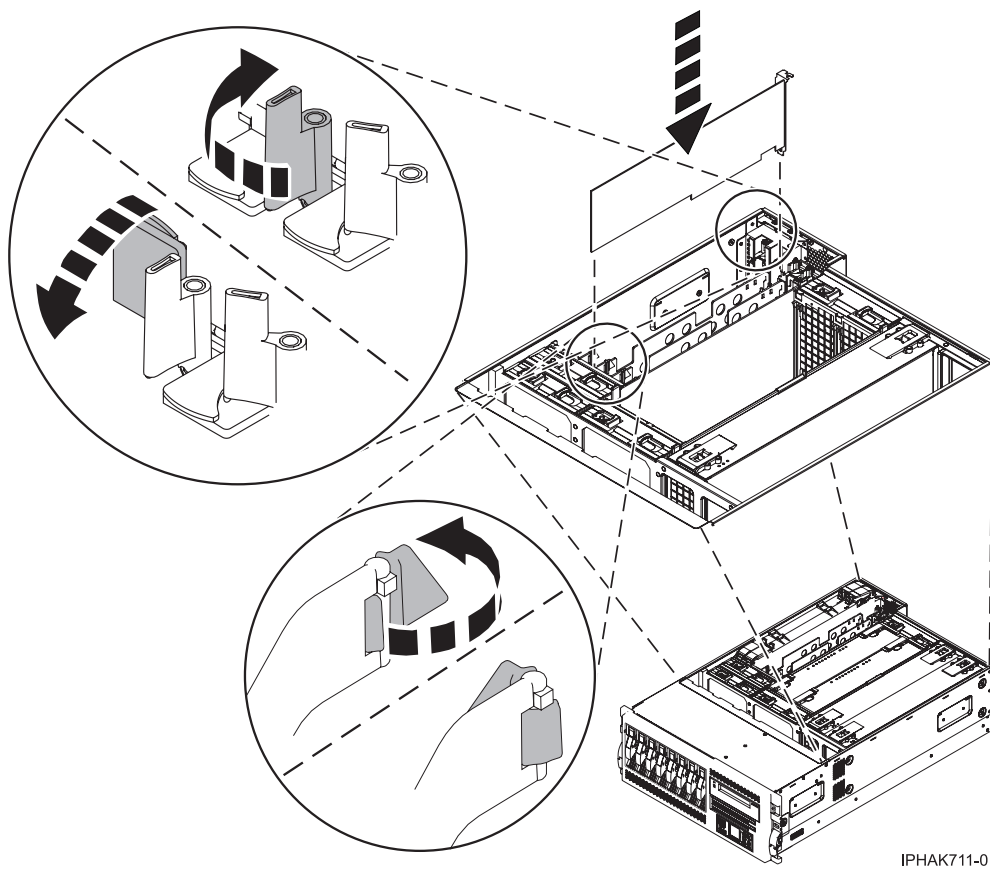
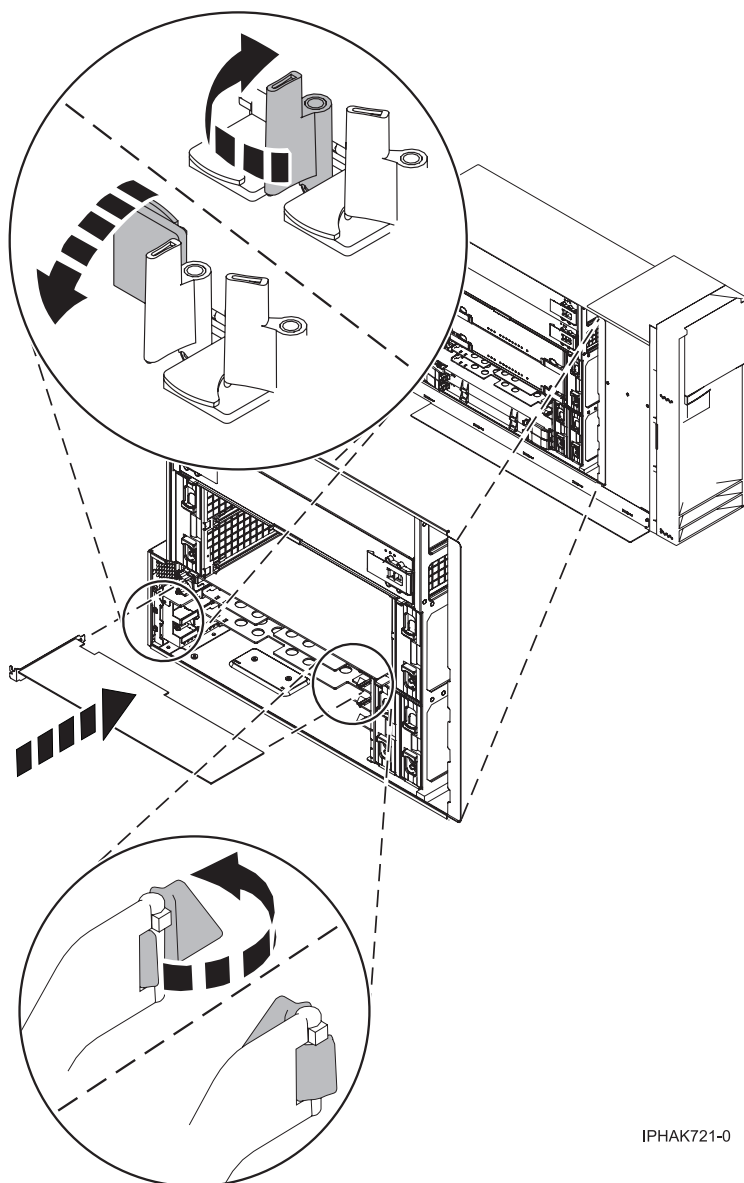


Figure 73. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 74. PCI adapter replaced in the stand-alone system unit

31. Connect the adapter cables.
32. Press enter and continue to follow the instructions in the system diagnostics 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 menu.
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. Replace or close the covers.
45. “Place the rack-mounted system or expansion unit in the operating position” on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
46. On a rack-mounted system, close the rear rack door.
47. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

## **Replace a model 55x, 720, or attached expansion-unit, PCI adapter with the system power on in i5/OS**

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

**Attention:** You must have already completed the procedure “Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in i5/OS” on page 97 in order to have the slot powered off.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

### **Important:**

- If the adapter is the load source IOA or the load source IOP, or any other storage IOA or IOP with critical DASD attached for the system or partition, follow the on-screen instructions when you use HSM to power down the IOP or IOA. Instructions to use functions 68 and 69 on the control panel will be included.
- If the adapter is the console IOA or the console IOP for the system or partition, you must perform the maintenance from an i5/OS session connected through a different IOA or IOP, or you must power down the partition to perform maintenance.
- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.

- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To replace a PCI adapter with the system power on in i5/OS, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If necessary, remove the adapter from the antistatic package.

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

4. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
5. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

6. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 75 on page 115 or Figure 76 on page 116.

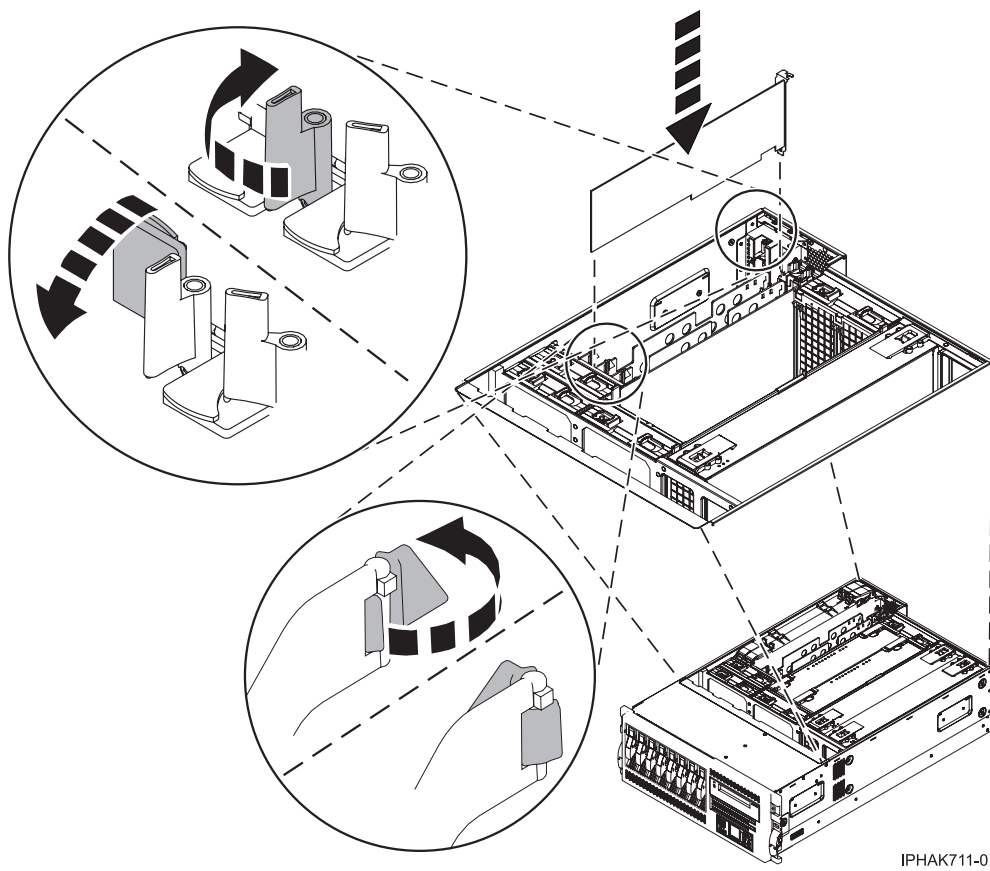
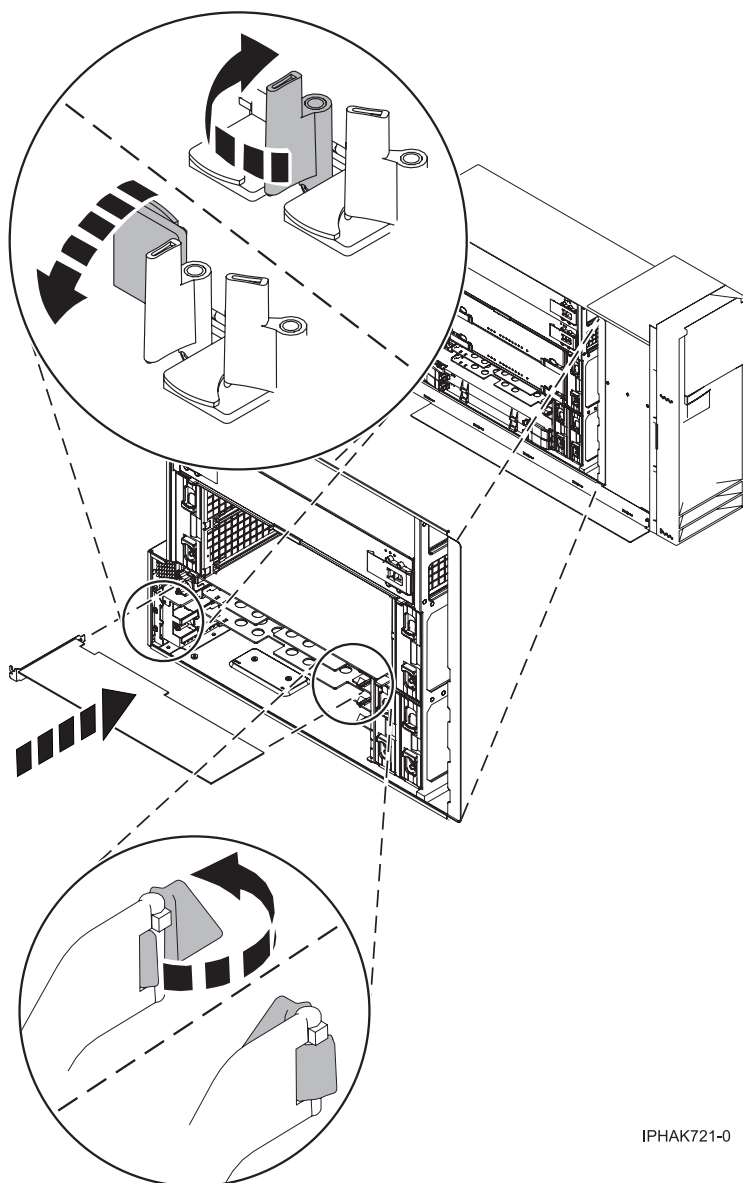


Figure 75. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 76. PCI adapter replaced in the stand-alone system unit

7. Connect the adapter cables.
8. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
9. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
10. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
11. Replace or close the covers.
12. On a rack-mounted system, close the rear rack door.
13. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
14. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.



## Replace a model 55x, 720, or attached expansion-unit, PCI adapter with the system power on in Linux

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

You must have already completed the procedure “Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power on in Linux” on page 101.

To replace a PCI adapter with the system power on in Linux, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If necessary, remove the adapter from the antistatic package.

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

4. Place the adapter, component-side up, on a flat, static-protective surface.
5. Run the `drslot_chrp_pci` command to enable an adapter to be replaced:

For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

```
drslot_chrp_pci -R -s U7879.001.DQD014E-P1-C3
```

Follow the instructions on the display to complete the task.

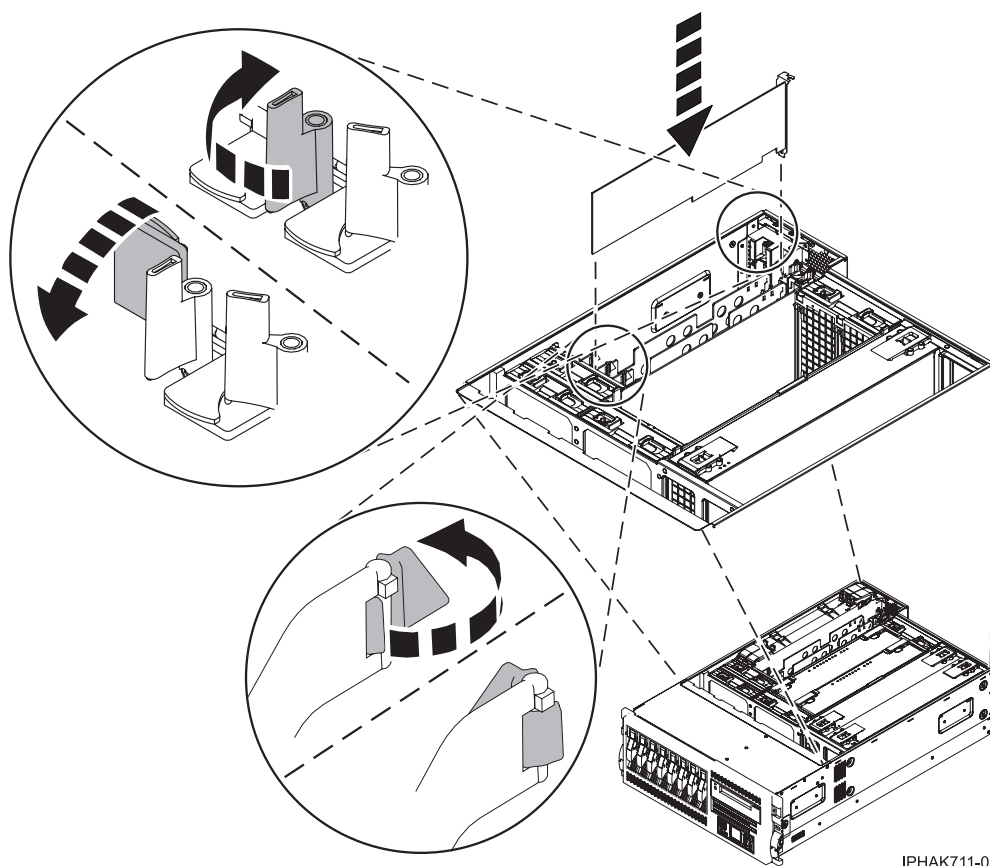
6. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

7. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
8. Press the adapter firmly into its connector.

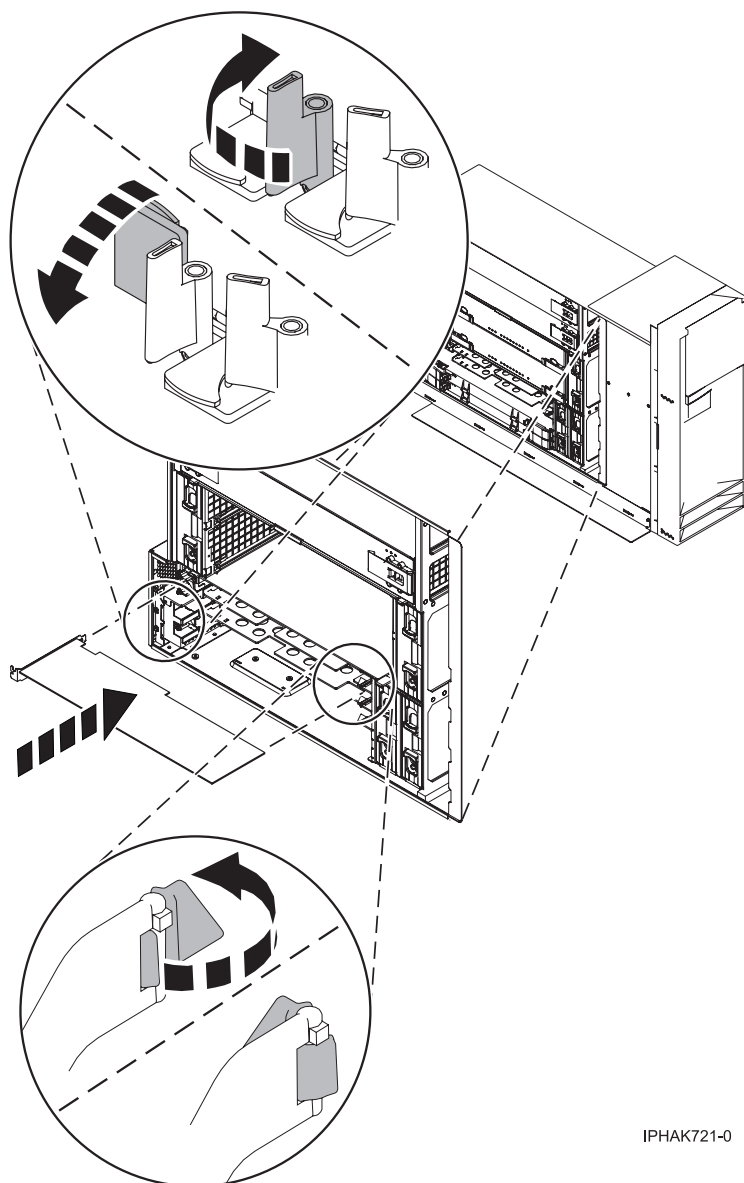
**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

9. Secure the adapter. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 77 on page 118 or Figure 78 on page 119.



IPHAK711-0

Figure 77. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

Figure 78. PCI adapter replaced in the stand-alone system unit

10. Connect the adapter cables.
11. 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	
12. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
13. Replace or close the covers.
14. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
15. On a rack-mounted system, close the rear rack door.
16. "Start the system or logical partition" on page 398.
17. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Replace model 55x, 720, or attached expansion-unit, PCI adapters with the system power off

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

You must have already completed the procedure “Remove model 55x, 720, or attached expansion-unit, PCI adapters with the system power off” on page 104 in order to have the slot powered off.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

To replace a PCI adapter with the system power off, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If necessary, remove the adapter from the antistatic package.

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

4. Place the adapter, component-side up, on a flat, static-protective surface.
5. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
6. Press the adapter firmly into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

7. Lower the tab onto the PCI adapter faceplate. Rotate the adapter locking latches clockwise as shown in Figure 79 on page 121 or Figure 80 on page 122.

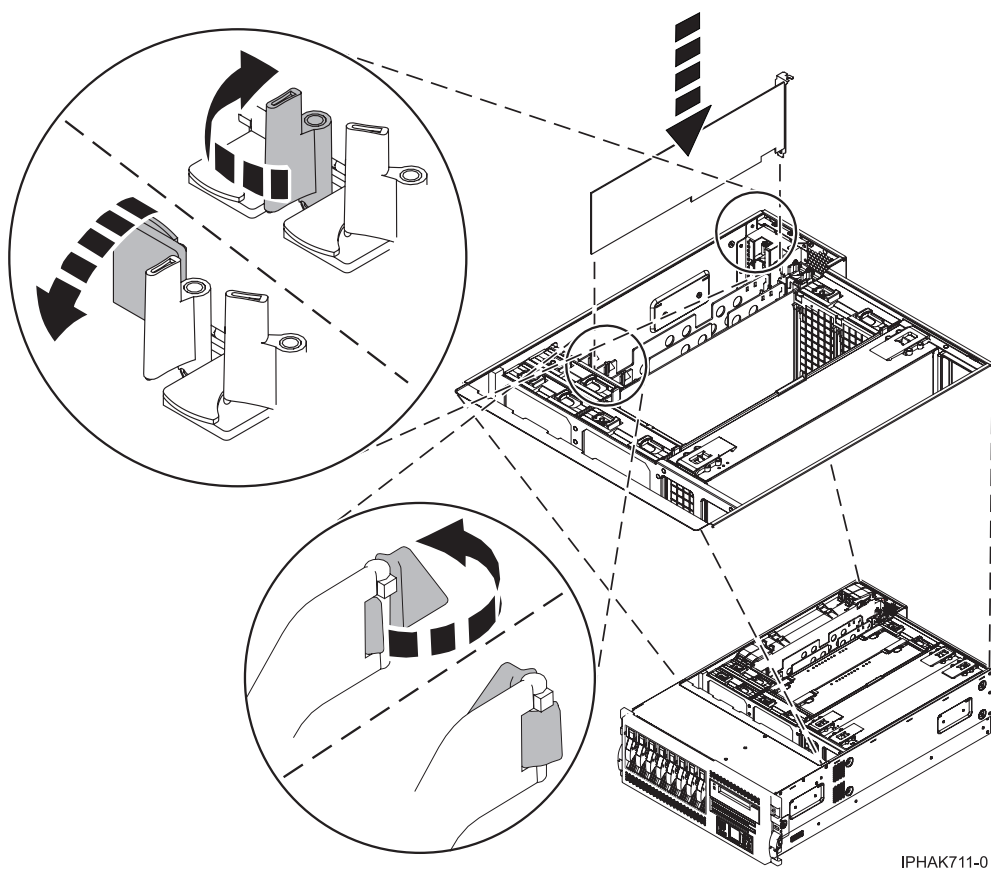
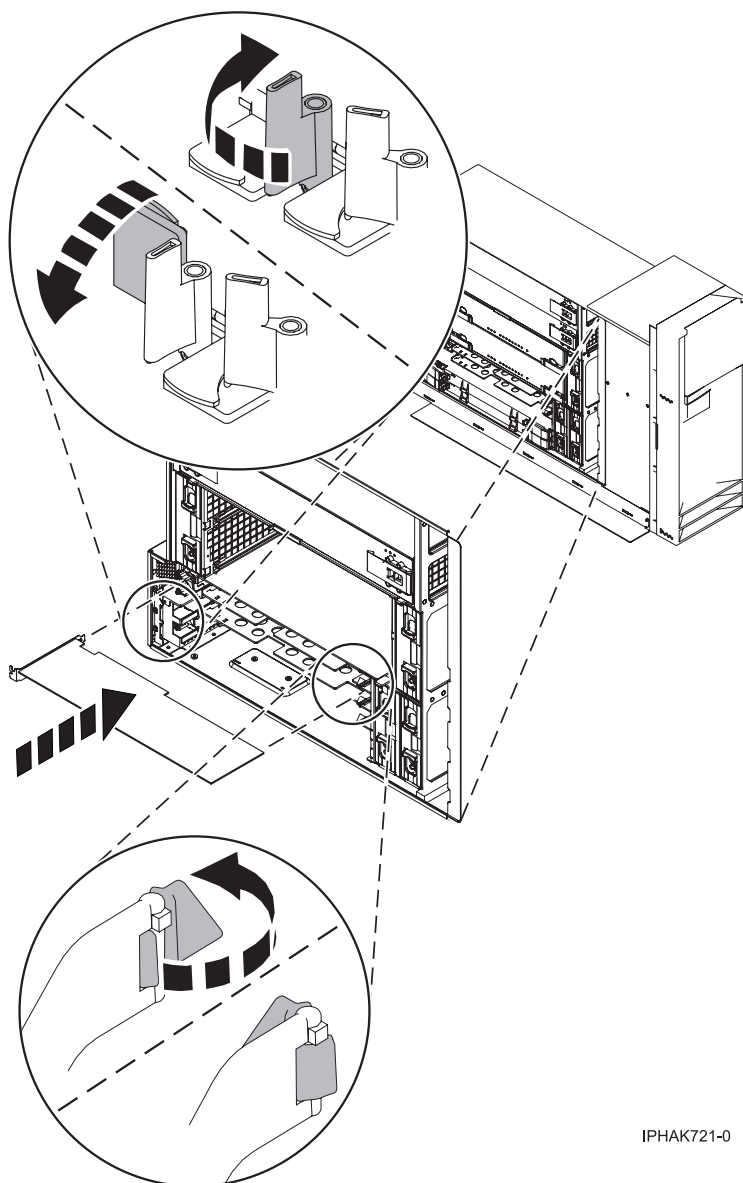


Figure 79. PCI adapter replaced in the rack-mounted system unit



IPHAK721-0

*Figure 80. PCI adapter replaced in the stand-alone system unit*

8. Connect the adapter cables.
9. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
10. Replace or close the covers.
11. Reconnect the power source to the system.
12. "Place the rack-mounted system or expansion unit in the operating position" on page 396 if you are servicing a rack-mounted system. If you are servicing a stand-alone system, continue to the next step.
13. On a rack-mounted system, close the rear rack door.
14. "Start the system or logical partition" on page 398.
15. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

---

## Model 285, 52x, 550, and 720 PCI adapter dividers

You might need to remove, replace, or install PCI adapter dividers. Use the procedures in this section to perform these tasks.

### Remove model 285 and 52x PCI adapter dividers

You might need to remove a PCI adapter divider. Use the procedure in this section to perform this task.

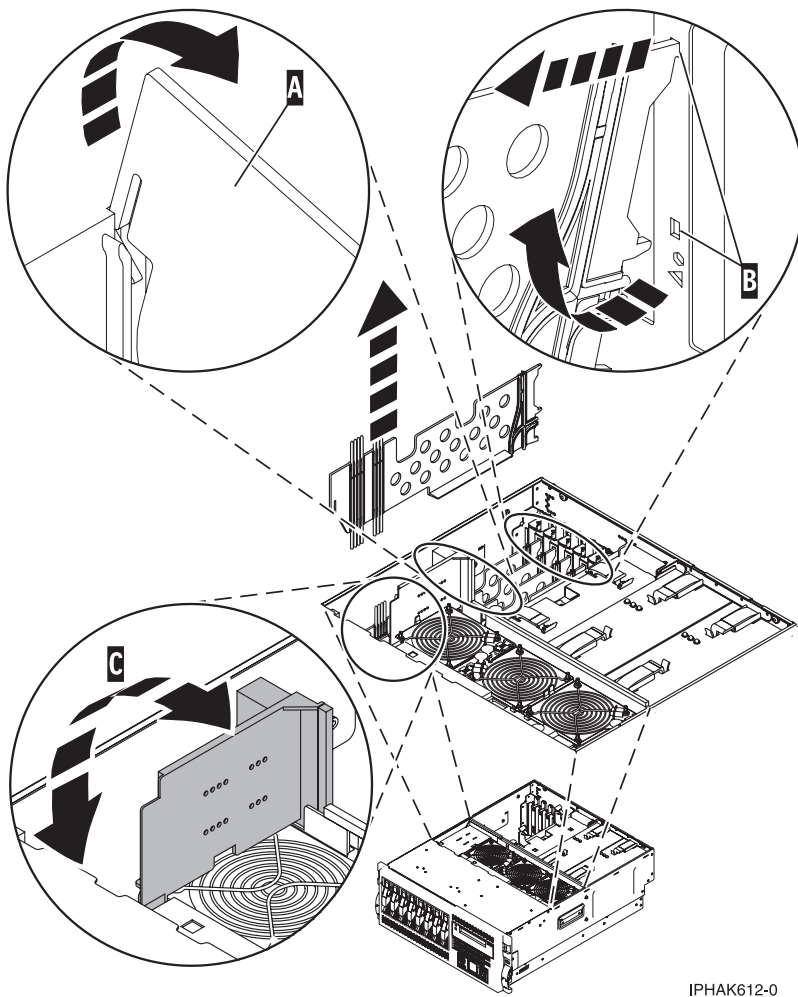
The following procedure describes the removal of the PCI adapter divider with the system power off. This procedure can be done with the system power on by omitting the steps related to powering off the system.

To remove a divider, do the following:

1. Perform prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. “Stop the system or logical partition” on page 399.
4. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

5. “Place the rack-mounted system or expansion unit in the service position” on page 392.
6. “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
7. Locate the PCI adapter divider you want to remove.
8. If you are removing a short adapter divider, continue to the next step. If you are removing a long adapter divider, do the following:
  - a. Unlatch and open the PCI adapter light-pipe plate **C** attached to the fan tray as shown in figure Figure 81 on page 124 or Figure 82 on page 125.
  - b. Note the guide grooves located toward the front of the system in the disk drive backplane for correct alignment.
9. Remove the adapter. Pull the front edge PCI adapter divider **A** out of the system and then pull the back edge of the adapter **B** away from the retention notches in the system chassis.



IPHAK612-0

Figure 81. PCI-adapter divider removed from the rack-mounted system unit



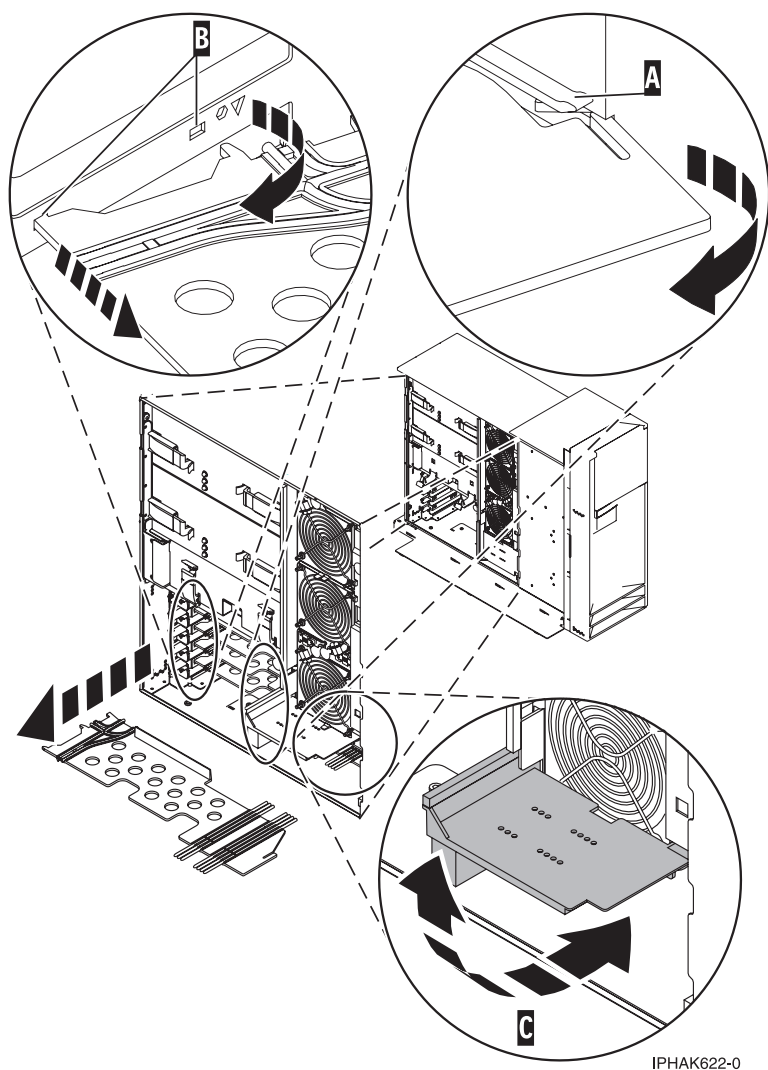


Figure 82. PCI-adapter divider removed from the stand-alone system unit

10. If you are removing the PCI adapter divider as part of another procedure, return to that procedure now. To replace the divider, see "Replace model 285 and 52x PCI adapter dividers."

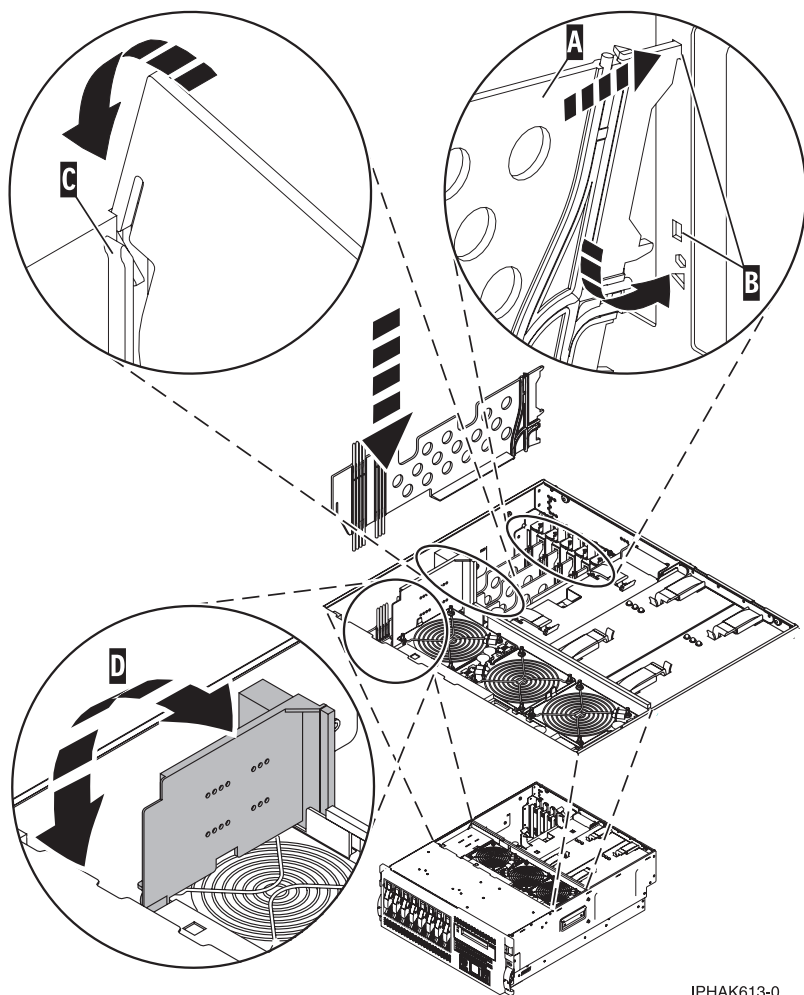
## Replace model 285 and 52x PCI adapter dividers

You might need to replace a PCI adapter divider. Use the procedure in this section to perform this task.

The following procedure describes the replacement of PCI adapter dividers with the system power off. This procedure can be done with the system power on by omitting the steps related to powering on the system. You must have already completed the procedure "Remove model 285 and 52x PCI adapter dividers" on page 123.

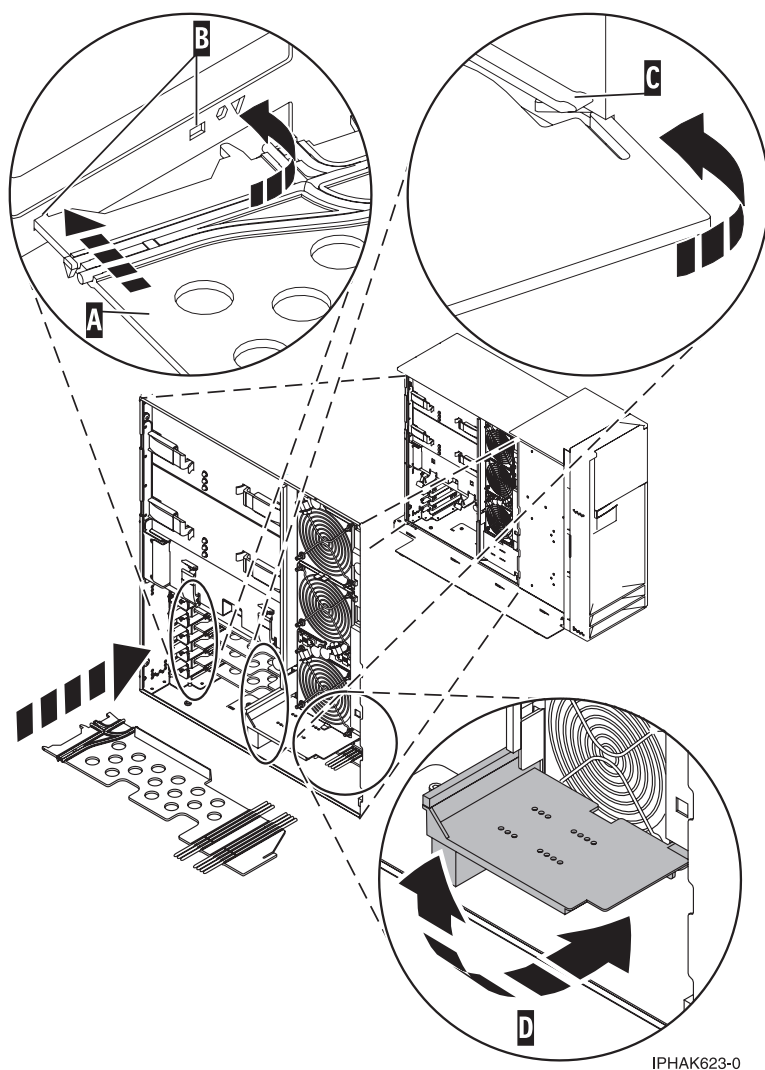
To replace a divider, do the following:

1. Locate the PCI adapter divider slot that you want to use.
2. Carefully grasp the adapter divider by its top edge and then align tab **A** and tab **B** on the back edge of the divider with the notches in the system chassis. See the following figures.
3. Insert the front edge of the divider **C** into the slot located at the front of the system and then press the divider into place.



IPHAK613-0

Figure 83. PCI-adapter divider replaced in the rack-mounted system unit



IPHA623-0

Figure 84. PCI-adapter divider replaced in the stand-alone system unit

4. If you are replacing or installing a short adapter divider, continue to the next step. If you are replacing or installing a long adapter, do the following:
  - a. Close and latch the PCI adapter light-pipe plate **D** attached to the fan tray.

**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 divider correctly.
5. "Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720" on page 369.
6. "Place the rack-mounted system or expansion unit in the operating position" on page 396.
7. Reconnect the power source to the system.
8. "Start the system or logical partition" on page 398.

## Remove model 55x and 720 PCI adapter dividers

You might need to remove a PCI adapter divider. Use the procedure in this section to perform this task.

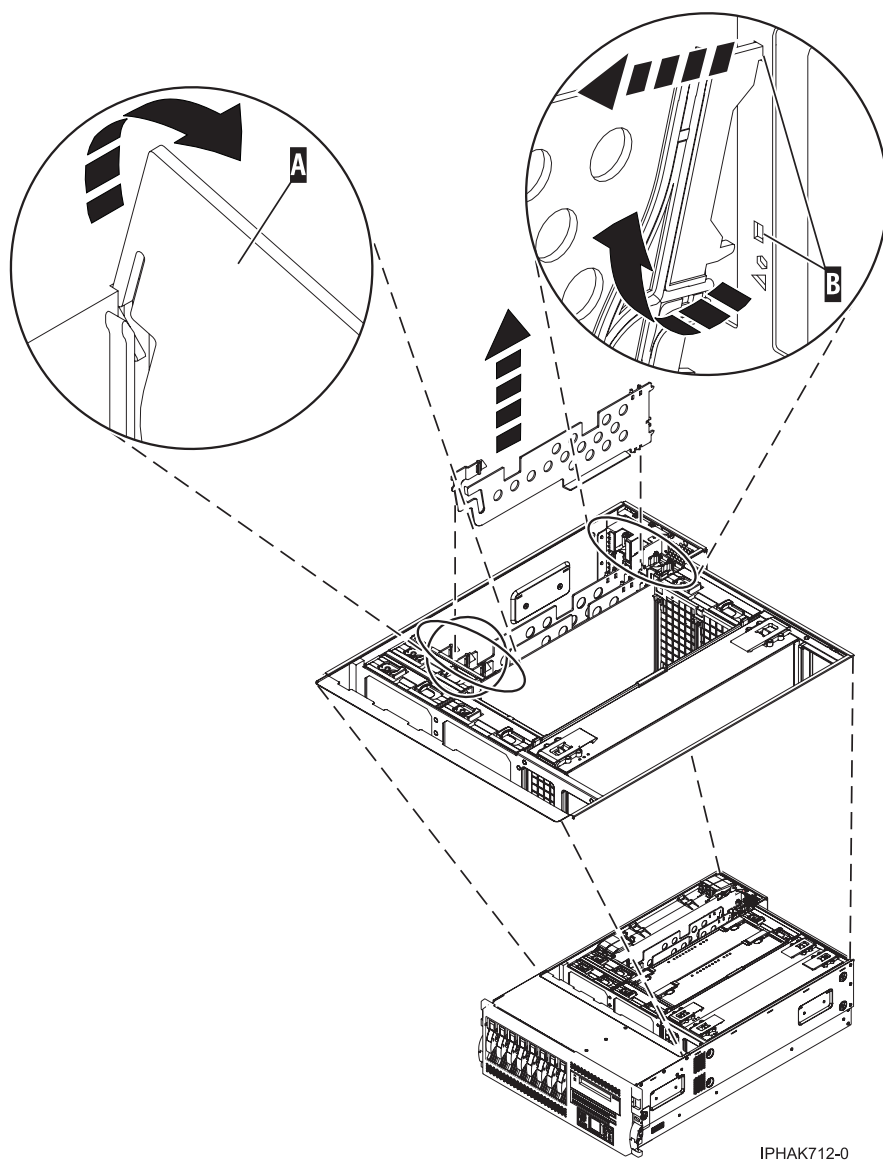
The following procedure describes the removal of PCI adapter dividers with the system power off. This procedure can be done with the system power on by omitting the steps related to powering off the system.

To remove a divider, do the following:

1. Perform prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. “Stop the system or logical partition” on page 399.
4. Disconnect the power source from the system by unplugging the system.

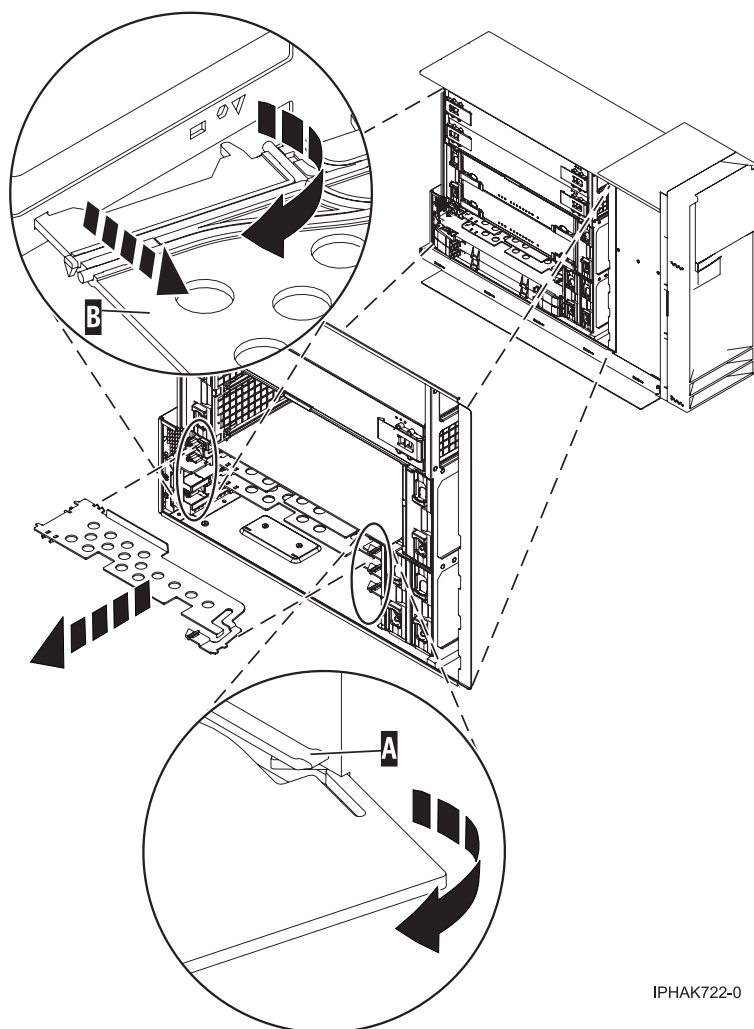
**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

5. “Place the rack-mounted system or expansion unit in the service position” on page 392.
6. “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 365.
7. Locate the PCI adapter divider you want to remove.
8. Remove the adapter. Pull the front edge PCI adapter divider **A** out of the system and then pull the back edge of the adapter **B** away from the retention notches in the system chassis.



IPHAK712-0

Figure 85. PCI-adapter divider removed from the rack-mounted system unit



IPHA722-0

Figure 86. PCI-adapter divider removed from the stand-alone system unit

9. If you are removing the PCI adapter divider as part of another procedure, return to that procedure now. To replace the divider, see "Replace model 55x and 720 PCI adapter dividers."

## Replace model 55x and 720 PCI adapter dividers

You might need to replace a PCI adapter divider. Use the procedure in this section to perform this task.

The following procedure describes the replacement of PCI adapter dividers with the system power off. This procedure can be done with the system power on by omitting the steps related to powering on the system. You must have already completed the procedure "Remove model 55x and 720 PCI adapter dividers" on page 127.

To replace a divider, do the following:

1. Locate the PCI adapter divider slot that you want to use.
2. Carefully grasp the adapter divider by its top edge and then align tab **A** and tab **B** on the back edge of the divider with the notches in the system chassis. See the following figures.
3. Insert the front edge of the divider **C** into the slot located at the front of the system and then press the divider into place.

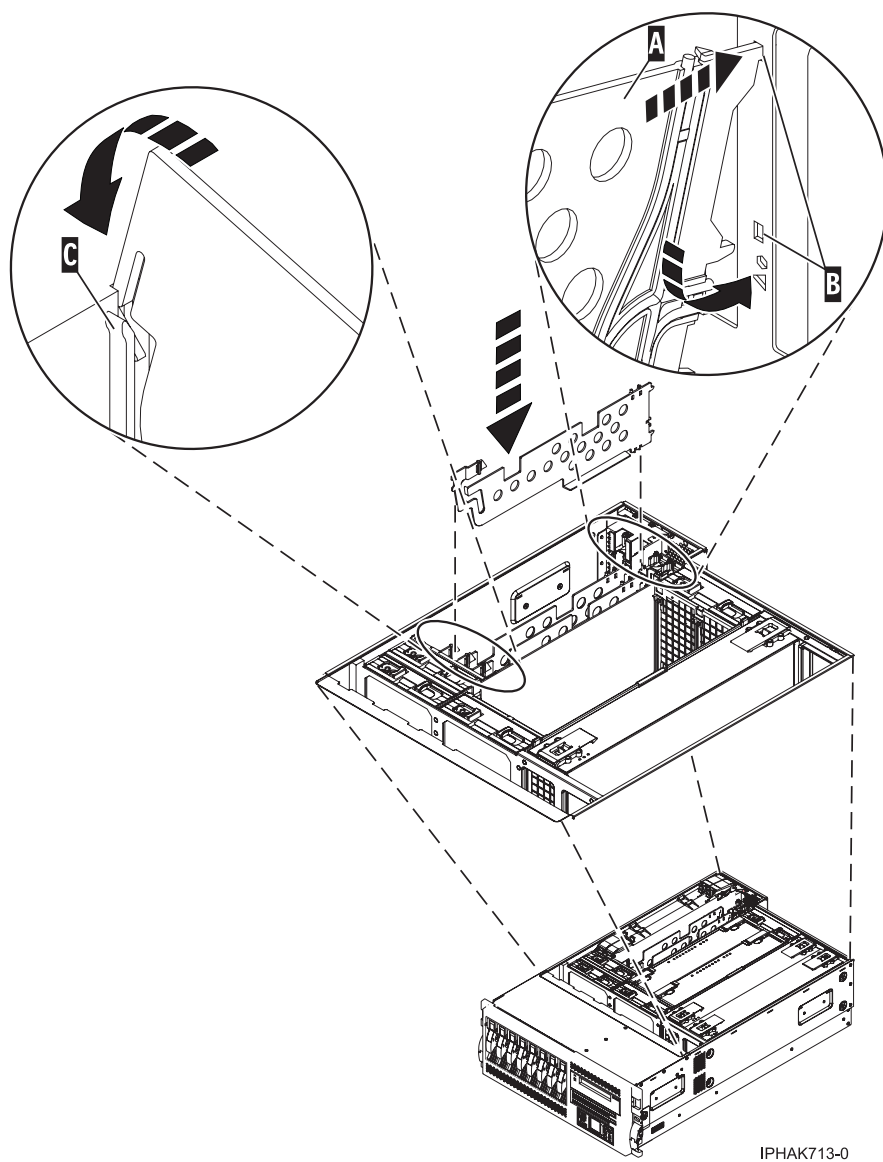
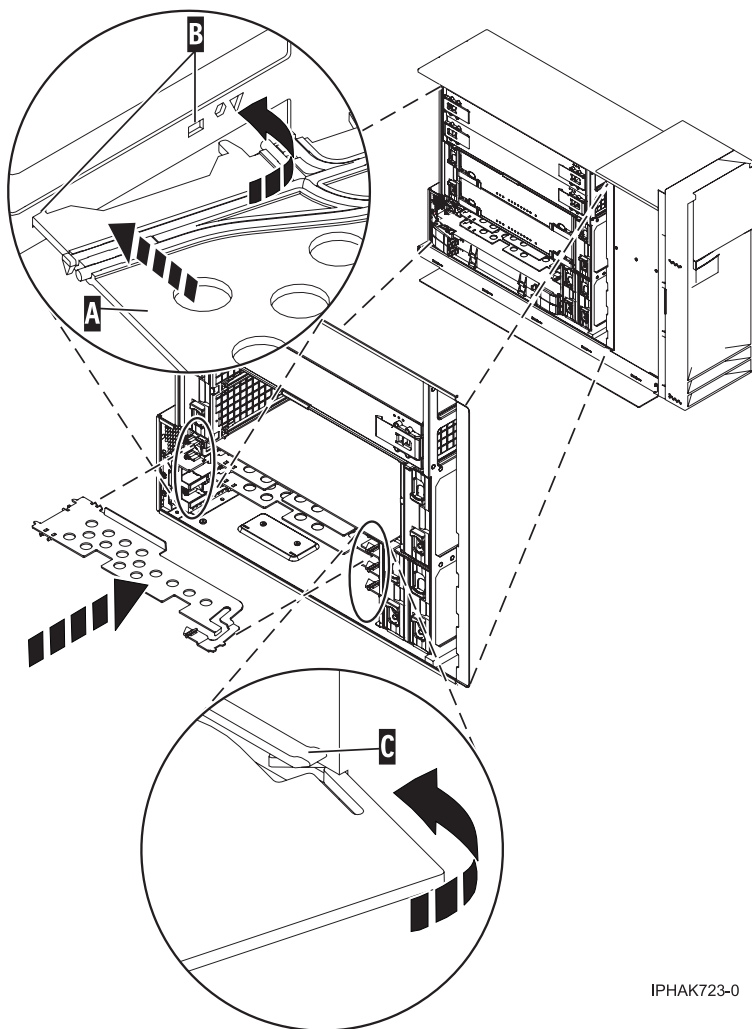


Figure 87. PCI-adapter divider replaced in the rack-mounted system unit




IPHAK723-0

Figure 88. PCI-adapter divider replaced in the stand-alone system unit

4. "Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720" on page 369.
5. "Place the rack-mounted system or expansion unit in the operating position" on page 396.
6. Reconnect the power source to the system.
7. "Start the system or logical partition" on page 398.

## Model 51x or 710 PCI adapters

You might need to remove, replace, or install PCI adapters. Use the procedures in this section to perform these tasks.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.



- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To install, remove, or replace model 51x or 710, or attached expansion-unit, PCI or PCI-X adapters, use the following procedures.

## Install a model 51x or 710 PCI adapter

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

The following procedure describes the installation of PCI adapters with the system power off. This system does not support the installation of PCI adapters with the system power on.

**Note:** If the system is partitioned, select the appropriate information from the following list to learn more about working in a partitioned environment, then return here:

- Partitioning for AIX
- Partitioning for Linux

To install a PCI adapter with the system power off, do the following:

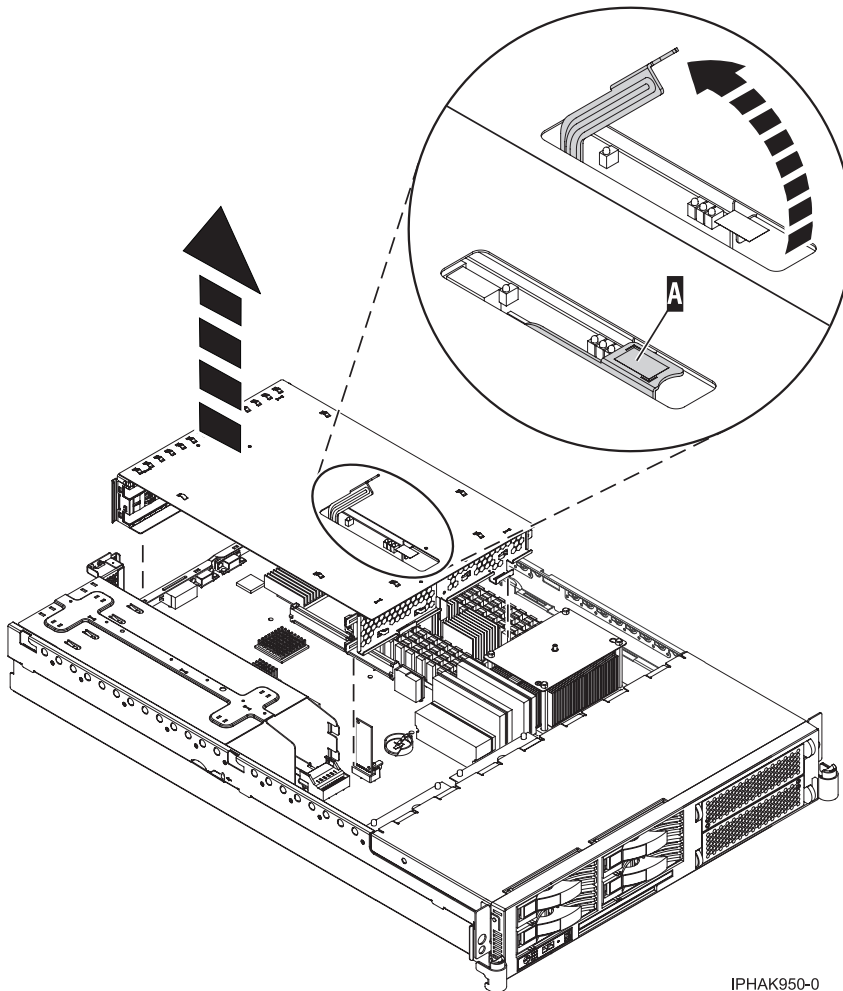
1. Determine in which slot to place the PCI adapter. Refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for adapters used in this system.
2. Perform the prerequisite tasks described in “Before you begin” on page 336.
3. “Stop the system or logical partition” on page 399.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. Open the front rack door.
7. Place the system in the service position. See “Place the model 51x or 710 in the service position” on page 377.
8. “Remove the service access cover from the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720” on page 366.
9. Ensure that any cables attached to the adapter to be removed are properly labeled, then disconnect the cables.
10. Open the PCI adapter enclosure handle **A**.

**Note:** With the enclosure handle in the open position, the enclosure riser card is still connected to the system backplane. Care must be taken to lift the enclosure straight out of the system without rocking it back and forth or lifting one end of the enclosure first. Failure to do so might result in damage to the system backplane or the riser card.

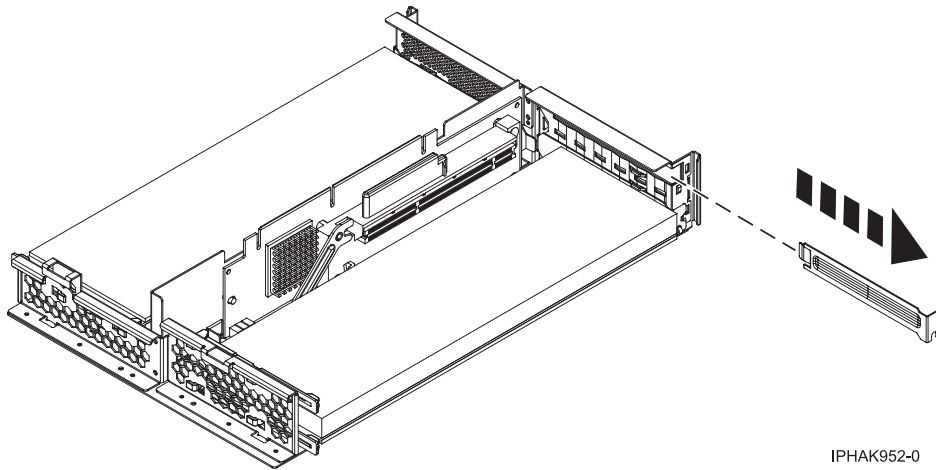
11. Grasping the enclosure by its top edges, front and back, lift the enclosure straight out of the system unit.



IPHAK950-0

*Figure 89. PCI adapter assembly removed from the system unit*

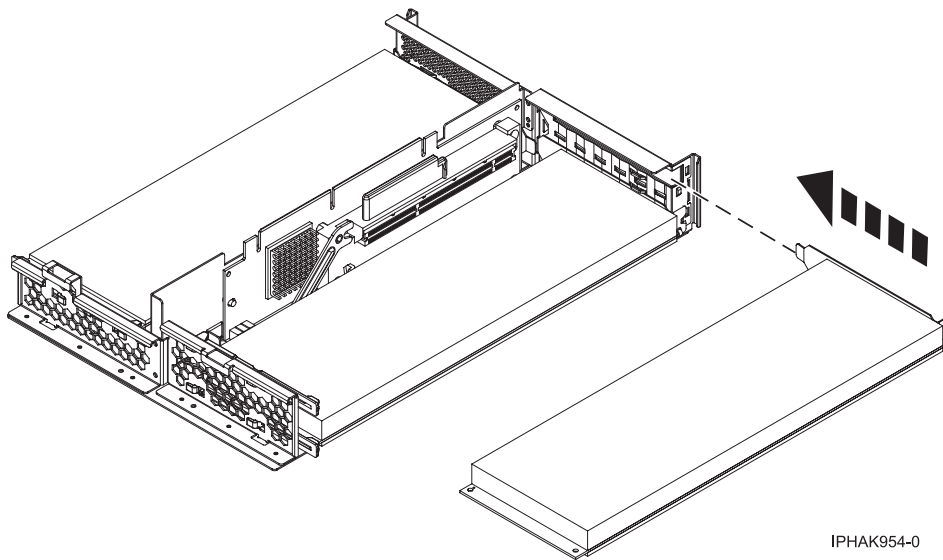
12. Rotate it so that the enclosure opening is facing upwards.
13. Place the enclosure on a flat, antistatic surface.
14. If necessary, remove the adapter expansion slot shield.



IPHAK952-0

Figure 90. PCI adapter slot cover removed from the assembly

15. If necessary, remove the adapter from the antistatic package.
- Attention:** Avoid touching the components and gold-edge connectors on the adapter.
16. Place the adapter, component-side up, on a flat, antistatic surface.
  17. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
  18. Slide the adapter into the assembly as shown in the following figure.



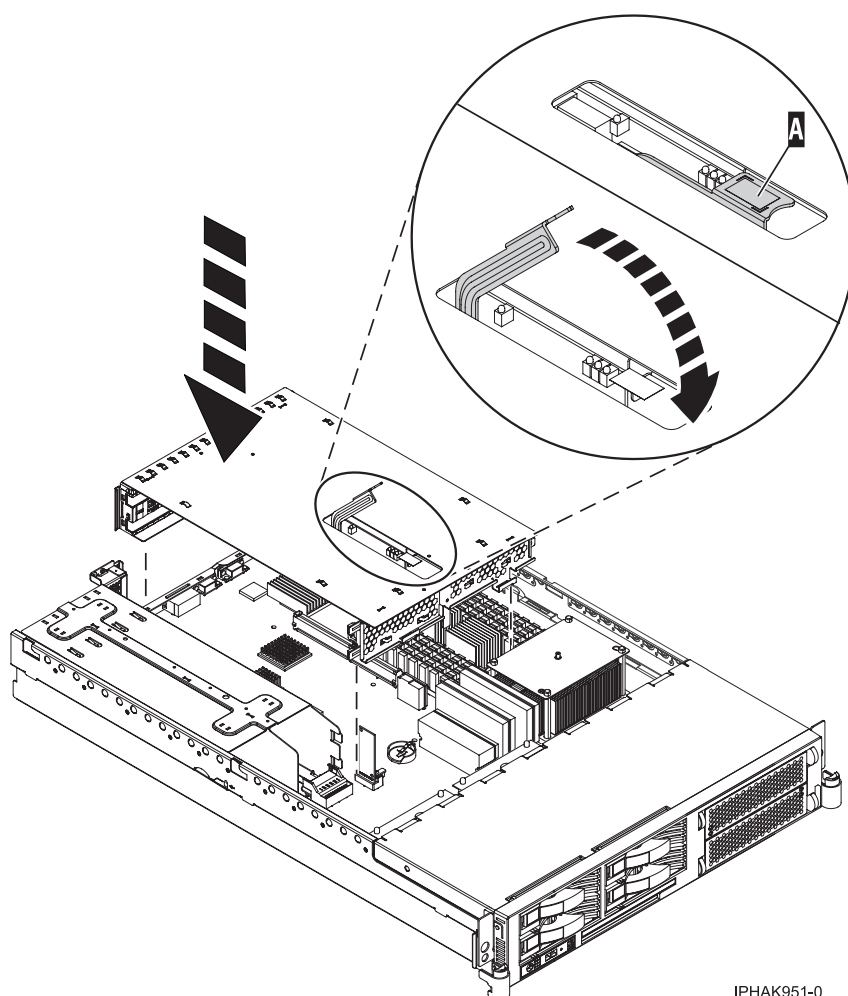
IPHAK954-0

Figure 91. PCI adapter placed in the assembly

19. Place the adapter into its slot in the enclosure, then press the adapter firmly into its connector.
- Note:** If you are placing a long adapter into the enclosure, ensure the adapter fits into the blue plastic guides at the end of the enclosure. Fit the blue plastic retaining clip over the hole in the lower right side of long adapters.
20. Rotate the PCI adapter enclosure so the handle faces away from the system unit with the handle in the open position.

21. While holding the enclosure by its top edges, align the two guide posts on the back of the enclosure with the guide slots at the back of the system unit.
22. Slowly lower the enclosure into the system unit while watching for correct alignment, then press it into the slot to connect the riser card. Pressing the enclosure into place will cause the handle to partially close.
23. Lock the enclosure into place by closing the handle **A** the rest of the way.

**Attention:** Do not force the handle **A** past the stop. Doing so can unseat a long adapter installed in PCI slot 2.



IPHAK951-0

*Figure 92. PCI adapter assembly placed in the system unit*

24. "Install the service access cover on the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720" on page 369.
25. "Place the model 51x or 710 in the operating position" on page 380.
26. Close the back rack door.
27. Reconnect the power source to the system.
28. "Start the system or logical partition" on page 398.
29. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Remove a model 51x or 710 PCI adapter

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

The following procedure describes the removal of PCI adapters with the system power off. This system does not support the removal of PCI adapters with the system power on.

To remove a PCI adapter, do the following:

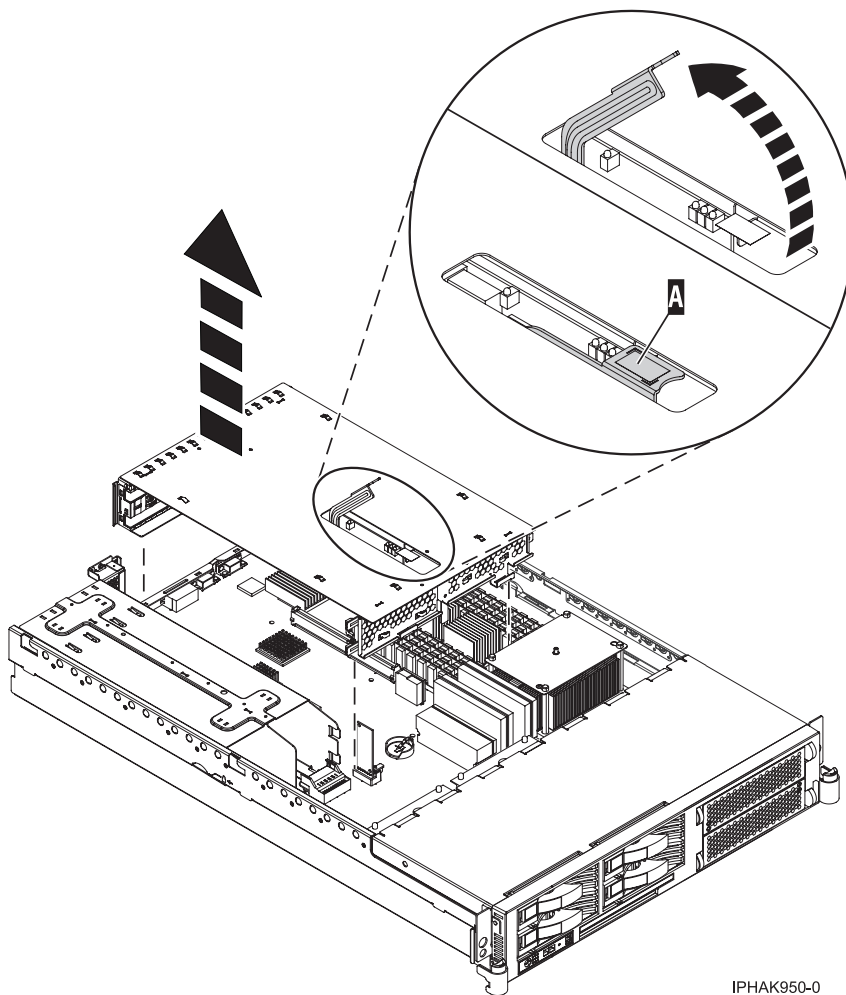
1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
3. “Stop the system or logical partition” on page 399.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. Open the front rack door.
7. Place the system in the service position. See “Place the model 51x or 710 in the service position” on page 377.
8. “Remove the service access cover from the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720” on page 366.
9. Ensure that any cables attached to the adapter to be removed are properly labeled, then disconnect the cables.
10. Open the PCI adapter enclosure handle **A**.

**Note:** With the enclosure handle in the open position, the enclosure riser card is still connected to the system backplane. Care must be taken to lift the enclosure straight out of the system without rocking it back and forth or lifting one end of the enclosure first. Failure to do so might result in damage to the system backplane or the riser card.

11. Grasping the enclosure by its top edges, front and back, lift the enclosure straight out of the system unit.



*Figure 93. PCI adapter assembly removed from the system unit*

12. Rotate it so that the enclosure opening is facing upwards.
13. Place the enclosure on a flat, antistatic surface.
14. Before handling any PCI adapter, see “Handling static-sensitive devices” on page 327.
15. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
16. Record the slot number and location of each adapter being removed.

**Note:** Adapter slots are numbered on the back of the system.

17. Slide the adapter out of the assembly as shown in the following figure.

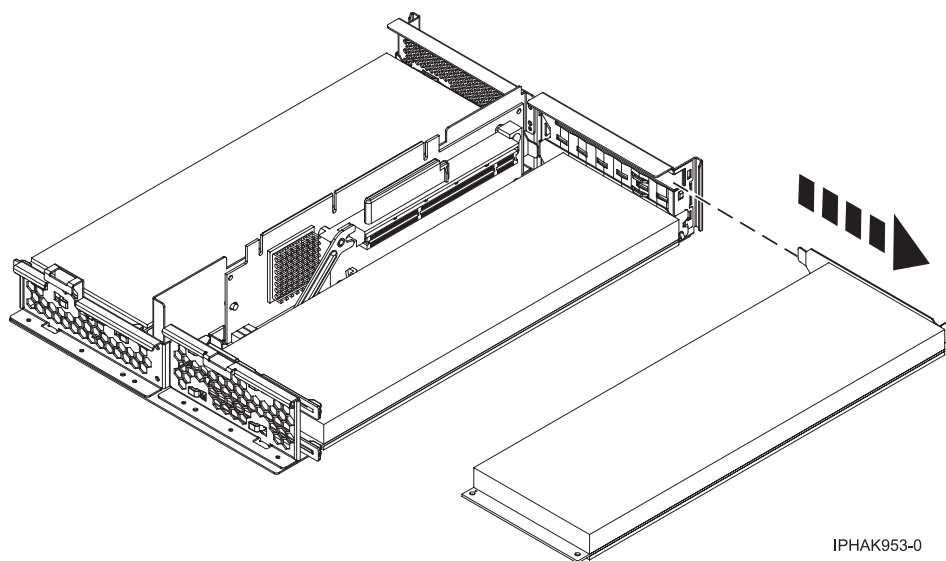


Figure 94. PCI adapter removed from the assembly

18. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
19. If you plan to install another adapter into the vacated slot, go to “Replace a model 51x or 710 PCI adapter”; otherwise, continue with the next step.
20. Seal the expansion slot using an expansion-slot cover.
21. Replace the cover.
22. Reconnect the power source to the system.
23. “Place the model 51x or 710 in the operating position” on page 380.
24. Close the back rack door.
25. “Start the system or logical partition” on page 398.

## Replace a model 51x or 710 PCI adapter

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.



The following procedure describes the replacement of PCI adapters with the system power off. This system does not support the removal of PCI adapters with the system power on. You must have already completed the procedure "Remove a model 51x or 710 PCI adapter" on page 136.

To replace a PCI adapter with the system power off, do the following:

1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. If necessary, remove the adapter from the antistatic package.

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

3. Place the adapter, component-side up, on a flat, antistatic surface.
4. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
5. Slide the adapter into the assembly as shown in the following figure.

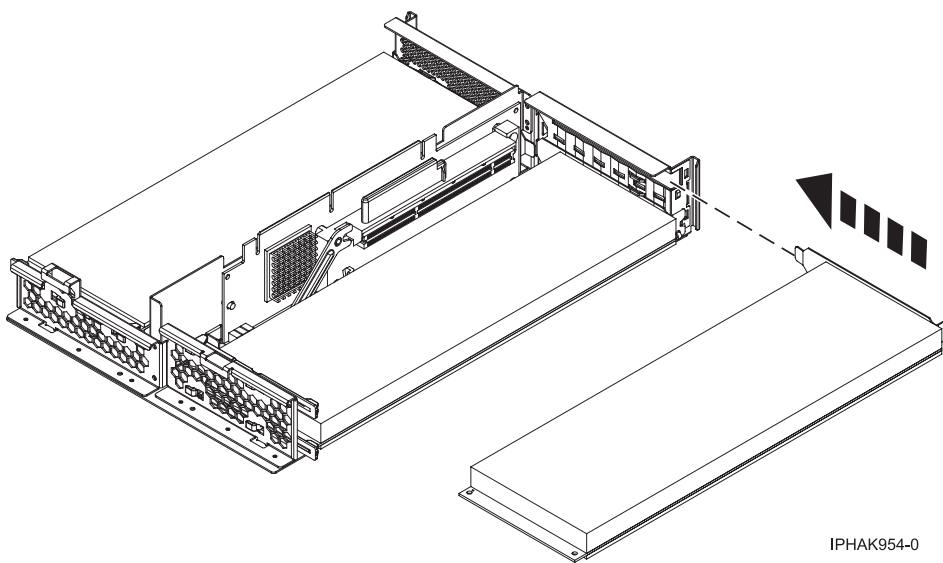


Figure 95. PCI adapter placed in the assembly

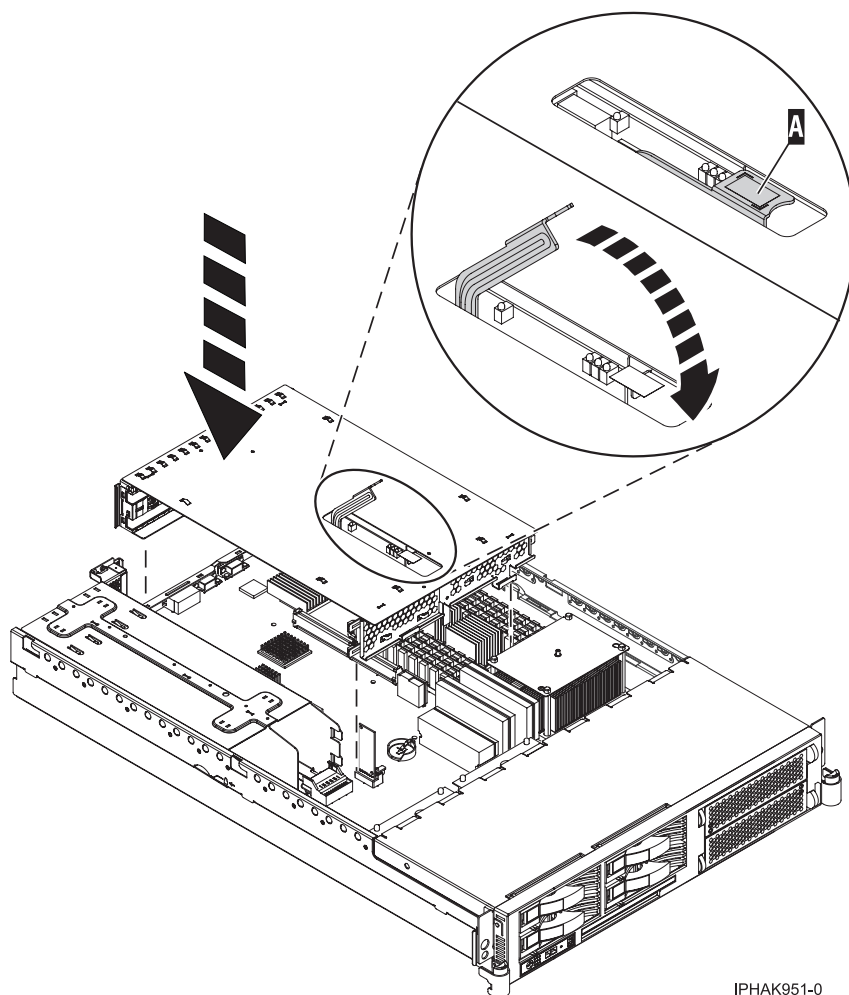
6. Place the adapter into its slot in the enclosure, then press the adapter firmly into its connector.

**Note:** If you are placing a long adapter into the enclosure, ensure the adapter fits into the blue plastic guides at the end of the enclosure. Fit the blue plastic retaining clip over the hole in the lower right side of long adapters.

7. Rotate the PCI adapter enclosure so the handle faces away from the system unit with the handle in the open position.
8. While holding the enclosure by its top edges, align the two guide posts on the back of the enclosure with the guide slots at the back of the system unit.
9. Slowly lower the enclosure into the system unit while watching for correct alignment, then press it into the slot to connect the riser card. Pressing the enclosure into place will cause the handle to partially close.
10. Lock the enclosure into place by closing the handle **A** the rest of the way.

**Attention:** Do not force the handle **A** past the stop. Doing so can unseat a long adapter installed in PCI slot 2.





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Figure 96. PCI adapter assembly placed in the system unit

11. "Install the service access cover on the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720" on page 369.
12. "Place the model 51x or 710 in the operating position" on page 380.
13. Reconnect the power source to the system.
14. Close the back rack door.
15. "Start the system or logical partition" on page 398.
16. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Model 560Q, 570, 590, 595 , and attached expansion units, PCI adapters and cassettes

You might need to remove, replace, or install PCI adapter cassettes. Use the procedures in this section to perform these tasks.

If you are installing a PCI adapter in an expansion unit that does not use cassettes, see the expansion-unit procedures for the "Model 55x, 720, or attached expansion-unit, PCI adapters" on page 69. Those same procedures can be used for an expansion unit attached to a 560Q, 570, 590, 595 .

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## Install a PCI adapter contained in a cassette

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

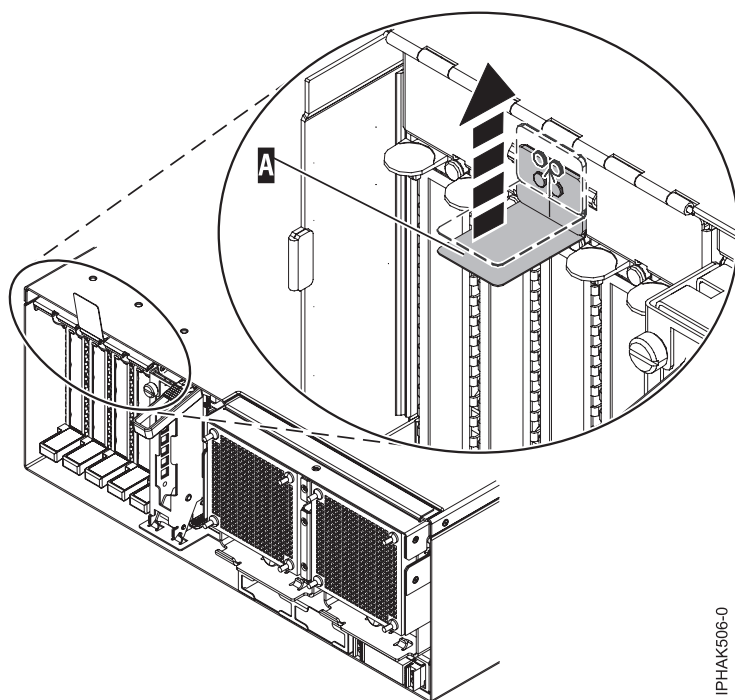
### Install a PCI adapter contained in a cassette with the power on in AIX

You might need to install a PCI adapter with the power on in AIX. Use the procedure in this section to perform this task.

**Note:** If the system is partitioned, see Partitioning for AIX to learn more about working in partitions, then return here to continue the procedure.

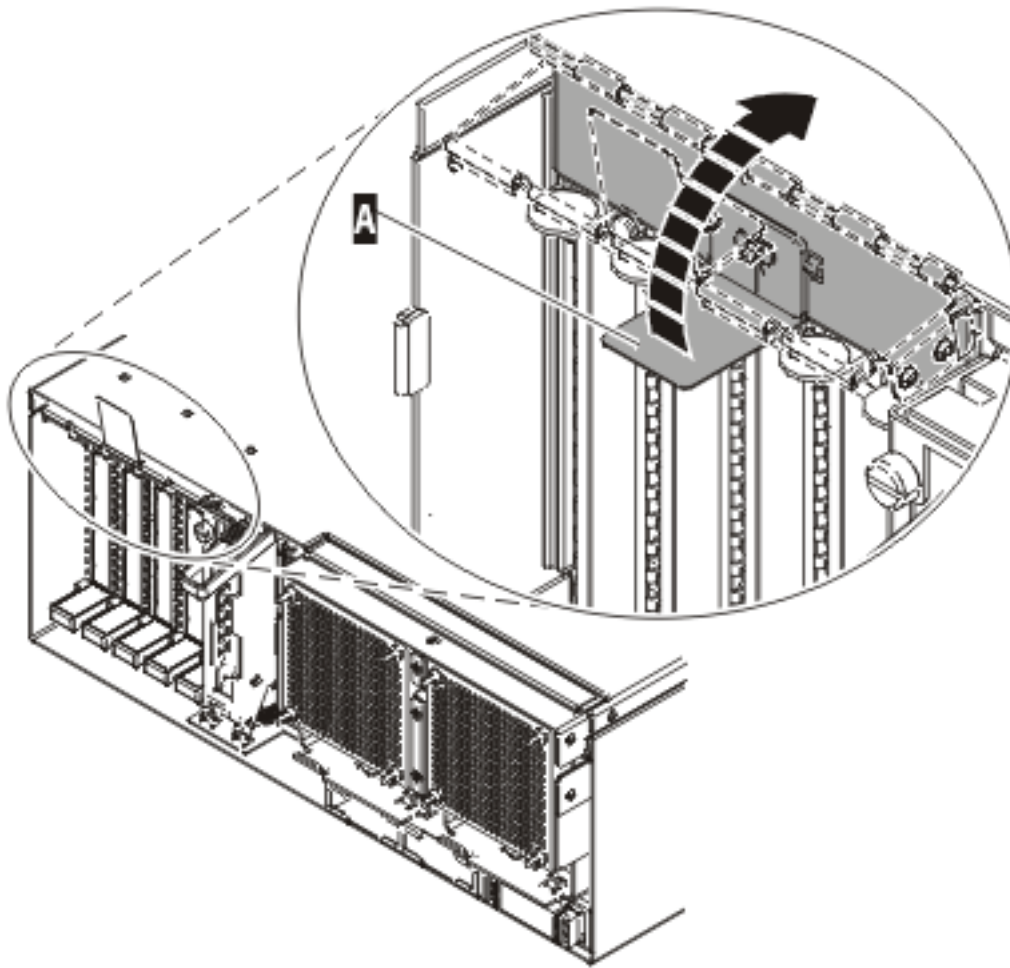
To install an adapter with the system power on in AIX, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. To determine in which slot to place the PCI adapter, refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for the adapters that can be used in this system.
4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
5. If you are installing a PCI adapter in a stand-alone expansion unit, remove the units back cover, if applicable.
6. Refer to “PCI hot-plug manager access for AIX” on page 327, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
7. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
8. Select the appropriate PCI slot from the ones listed on the screen, and press Enter.
9. Locate the PCI adapter slot and cassette you want to use.
10. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see “Remove a PCI adapter contained in a cassette from the system with the power on in AIX” on page 164.
11. Lift up the PCI adapter EMC shield **A** as shown in Figure 97 on page 143 and then rotate it up and away from the cassette as shown in Figure 98 on page 144.



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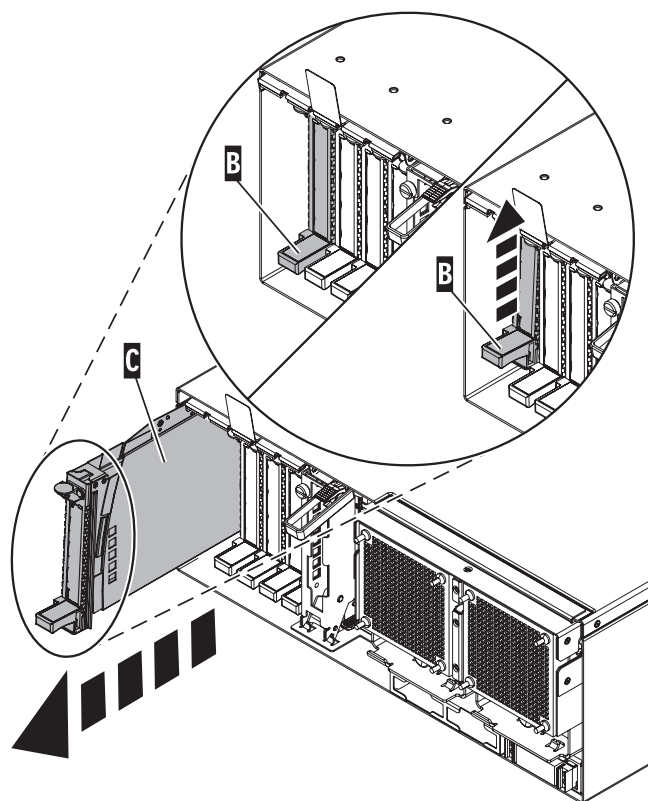
Figure 97. Lift up the EMC shield



IPHAK507-0

Figure 98. Rotate the EMC shield into the open position

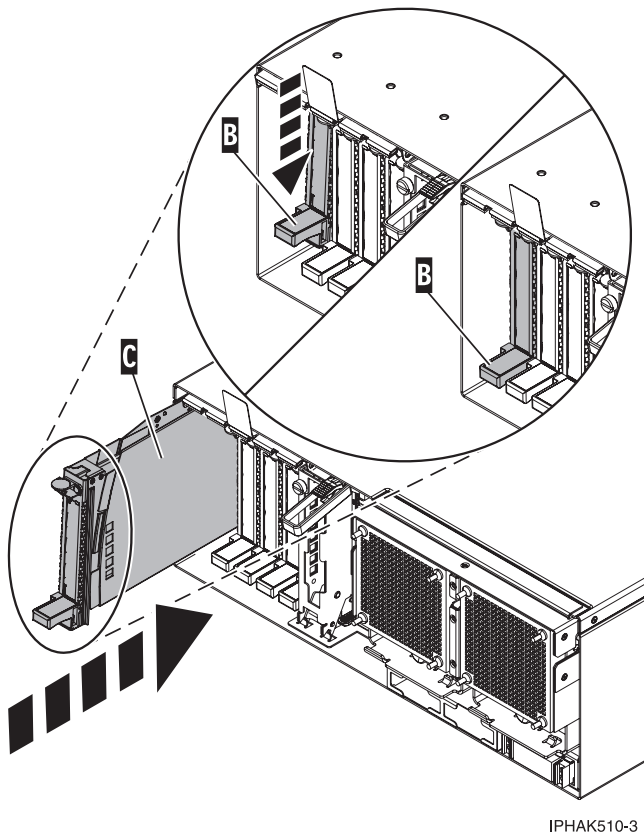
12. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.



IPHAK509-2

Figure 99. PCI adapter cassette removed from the system unit.

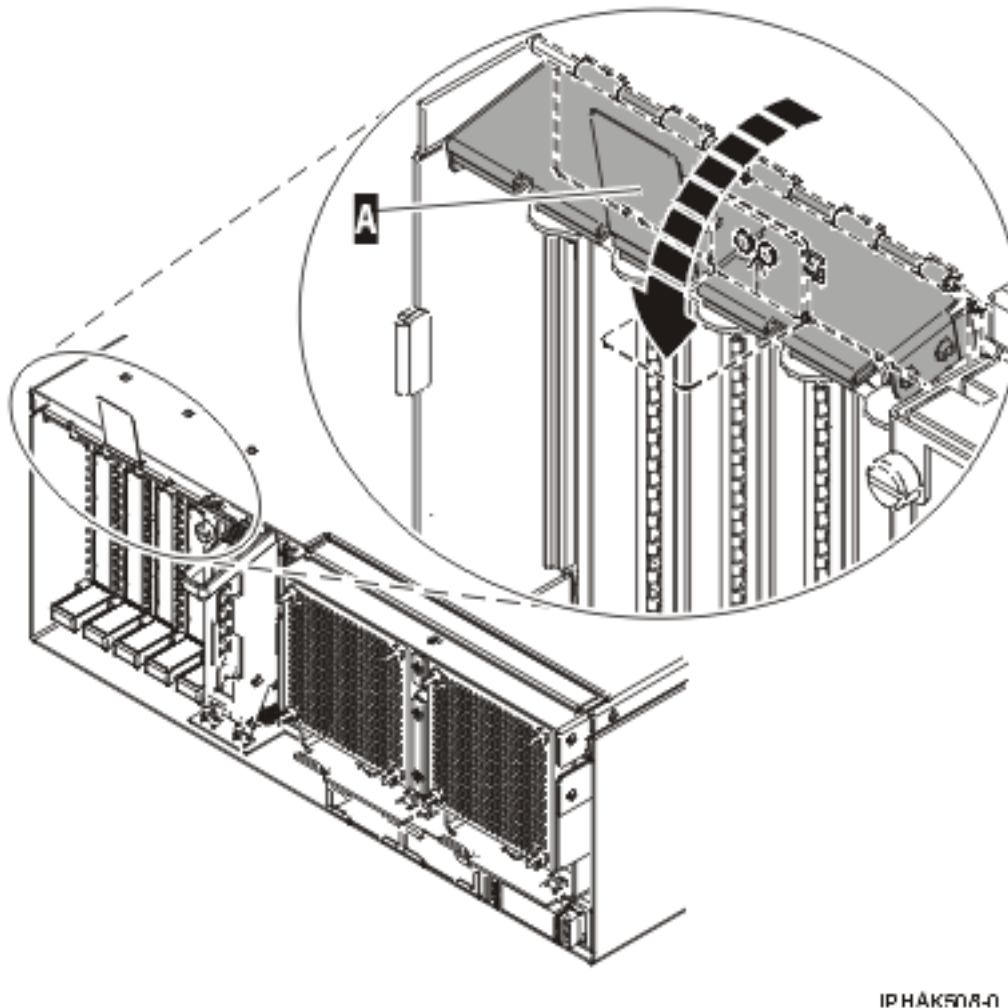
13. Install the adapter into the PCI adapter cassette using the following instructions:
  - “Place a PCI adapter in a single-width cassette” on page 195
  - “Remove an adapter from the PCI adapter single-width cassette” on page 192
14. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
15. Lift and hold the PCI adapter EMC shield in the open position. See Figure 97 on page 143 and Figure 98 on page 144.
16. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See “Component LEDs” on page 329.
17. Slide the cassette **C** into the cassette slot as shown in the following figure.
18. 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.



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Figure 100. PCI adapter cassette removed from the system unit

19. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IP HAK508-0

Figure 101. PCI adapter EMC shield in the closed position

20. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.

### Install a PCI adapter contained in a cassette with the power on in i5/OS

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, see Installing new hardware for i5/OS logical partitions before installing a new PCI adapter and then return here to continue the procedure.

#### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.

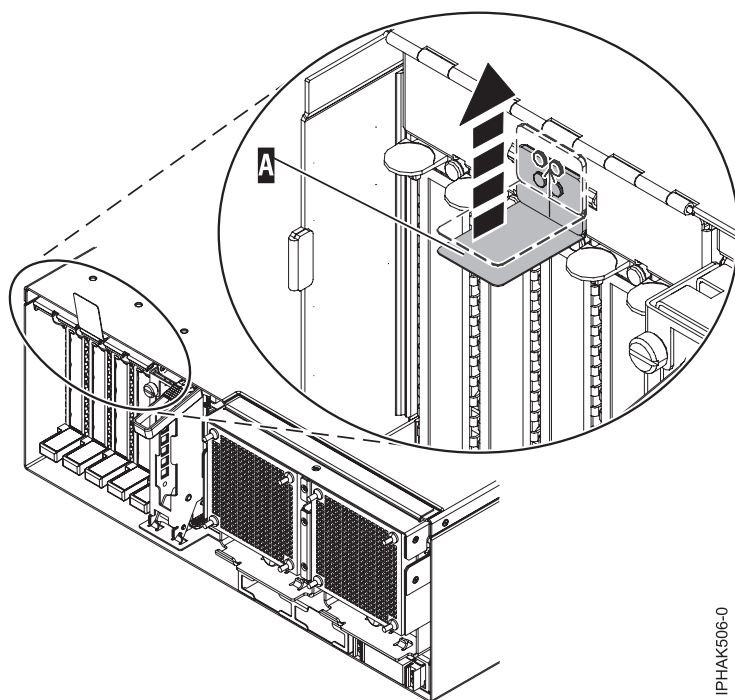


- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To install an adapter with the system power on in i5/OS, do the following:

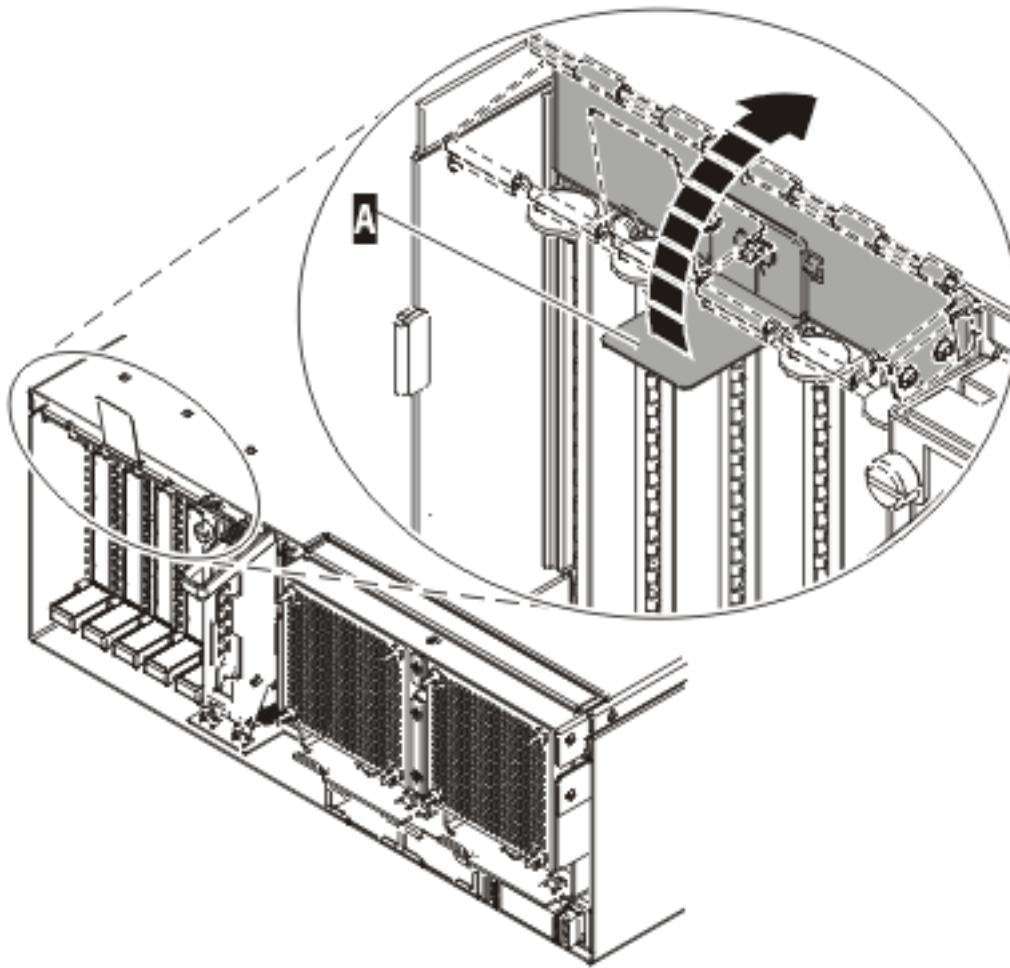
1. Perform the prerequisite tasks described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. To determine in which slot to place the PCI adapter, refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for the adapters that can be used in this system.
4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
5. If you are installing a PCI adapter in a stand-alone expansion unit, remove the units back cover, if applicable.
6. Type **strsst** on the command line of the Main Menu and then press Enter.
7. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
8. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
9. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
10. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
11. Type **9** (Hardware contained within package) in the *System Unit* or *Expansion Unit* field of the unit where you are replacing the card. Press Enter.
12. Select the option to **Include empty positions**.
13. Select **Concurrent Maintenance** on the card position where you want to replace the card and then press Enter.
14. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
15. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
16. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
17. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power off complete
18. Locate the PCI adapter slot and cassette you want to use.
19. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see “Remove a PCI adapter contained in a cassette from the system with the power on in i5/OS” on page 168.
20. Lift up the PCI adapter EMC shield **A** as shown in Figure 102 on page 149 and then rotate it up and away from the cassette as shown in Figure 103 on page 150.





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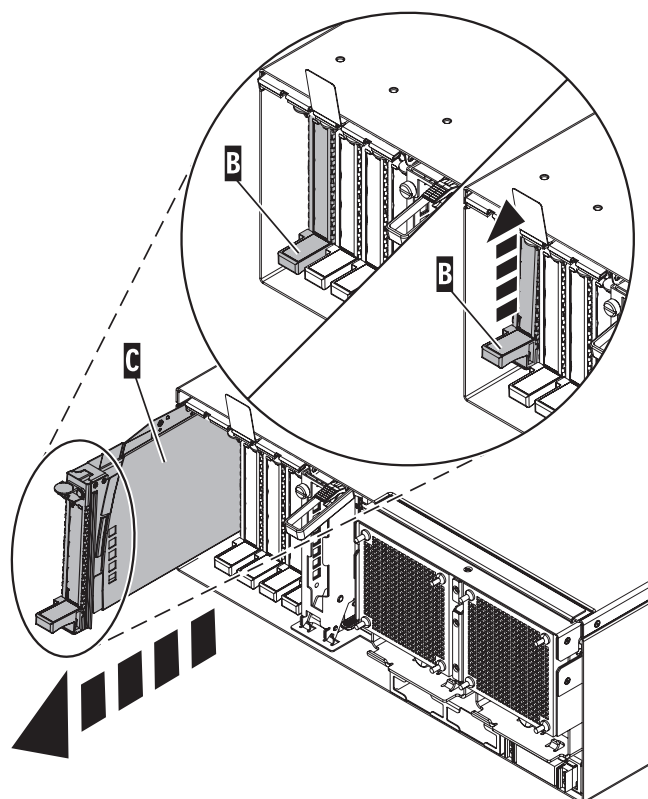
Figure 102. Lift up the EMC shield



IPHAK507-0

Figure 103. Rotate the EMC shield into the open position

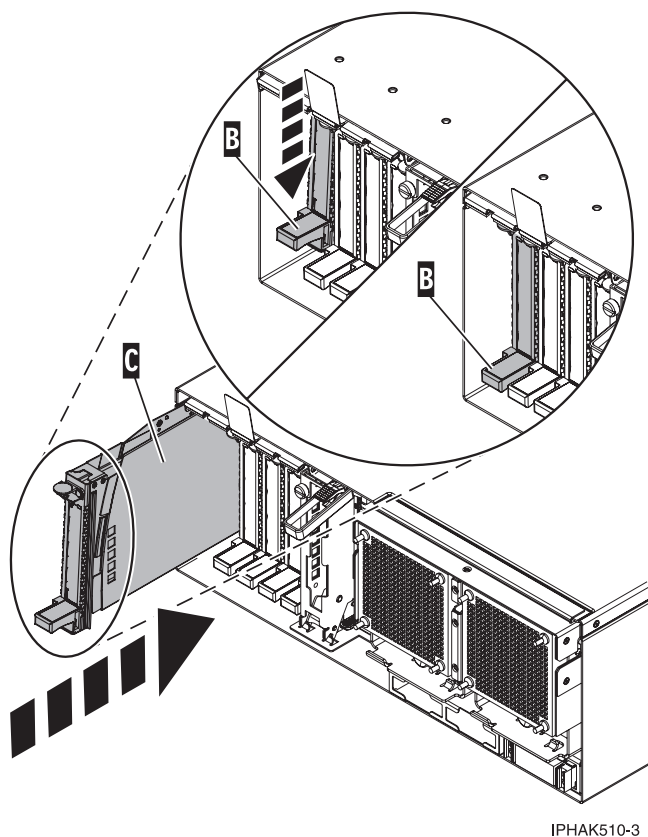
21. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.



IPHAK509-2

Figure 104. PCI adapter cassette removed from the system unit.

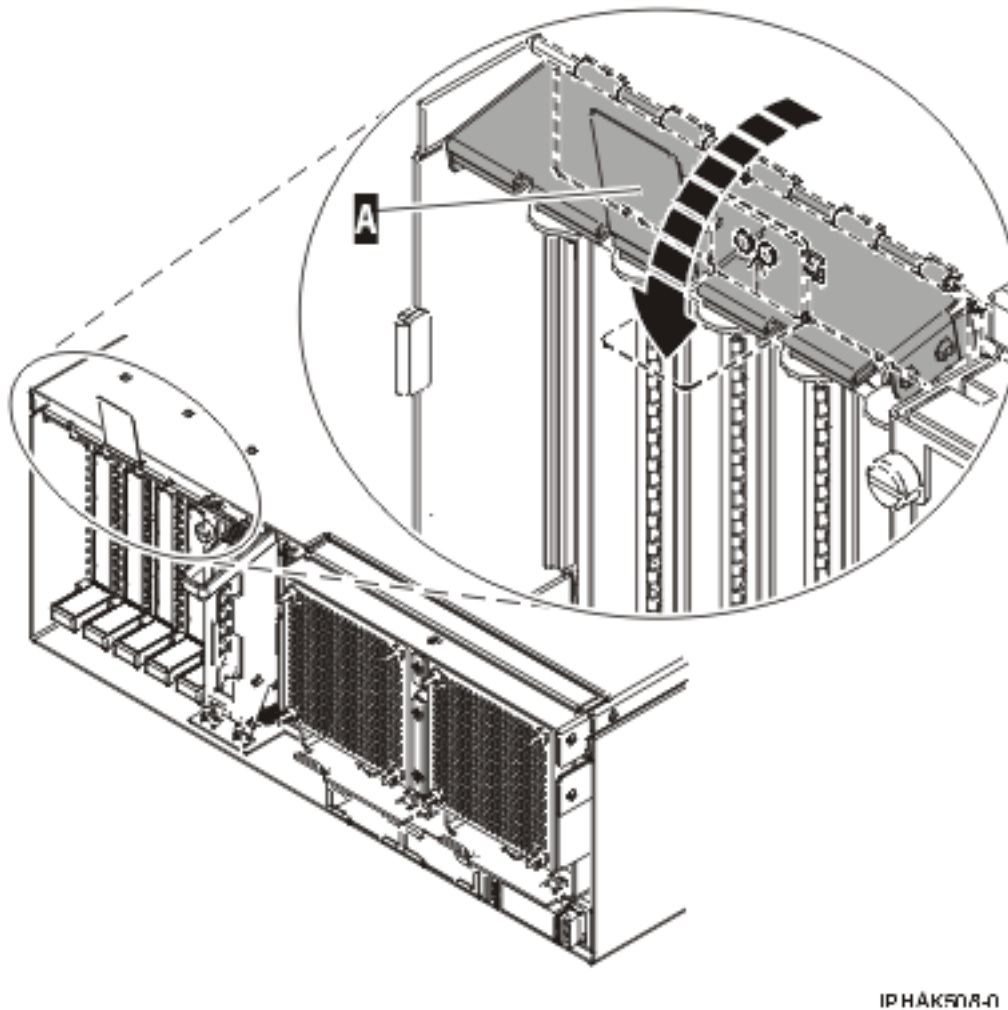
22. Install the adapter into the PCI adapter cassette using the following instructions:
  - “Place a PCI adapter in a single-width cassette” on page 195
  - “Remove an adapter from the PCI adapter single-width cassette” on page 192
23. Ensure the lower cassette handle is pressed up toward the retainer 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 102 on page 149 and Figure 103 on page 150.
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.



IPHAK510-3

Figure 105. PCI adapter cassette removed from the system unit

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



IP HAK508-0

Figure 106. PCI adapter EMC shield in the closed position

28. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
29. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
30. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
31. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

#### Related information

"Remove the back door from the 5074, 5079, and 5094 expansion unit" on page 386

You might need to remove the door to access components or perform service. Use the instructions in this section to accomplish this task.

"Remove the back cover from the 0588 expansion unit" on page 389

You might need to remove the cover to access components or perform service. Use the instructions in this section to accomplish this task.

"Remove the back door and cover from the 5095 expansion unit" on page 388

You might need to remove the door and cover to access components or perform service. Use the instructions in this section to accomplish this task.

“PCI adapter placement in the system unit or expansion unit” on page 209

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

“Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323

If you have exchanged a 2766, 2787, or 280E Fibre Channel IOA, the IBM external storage subsystem must be updated to use the worldwide port name (WWPN) of the new 2766, 2787, or 280E IOA. Any SAN hardware using WWPN zoning might also need updating.

## Install a PCI adapter contained in a cassette with the power on in Linux

You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

If the system is partitioned, see Partitioning for Linux to learn more about working in partitions, then return here to continue the procedure.

To install an adapter with the system power on in Linux, do the following:

1. Perform prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. To determine in which slot to place the PCI adapter, refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for the adapters that can be used in this system.
4. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
5. If you are installing a PCI adapter in a stand-alone expansion unit, remove the units back cover, if applicable.
6. Log in to the system console as the root user.
7. Use the `lsslot` tool to list the hot-plug PCI slots that are available in the server or partition:

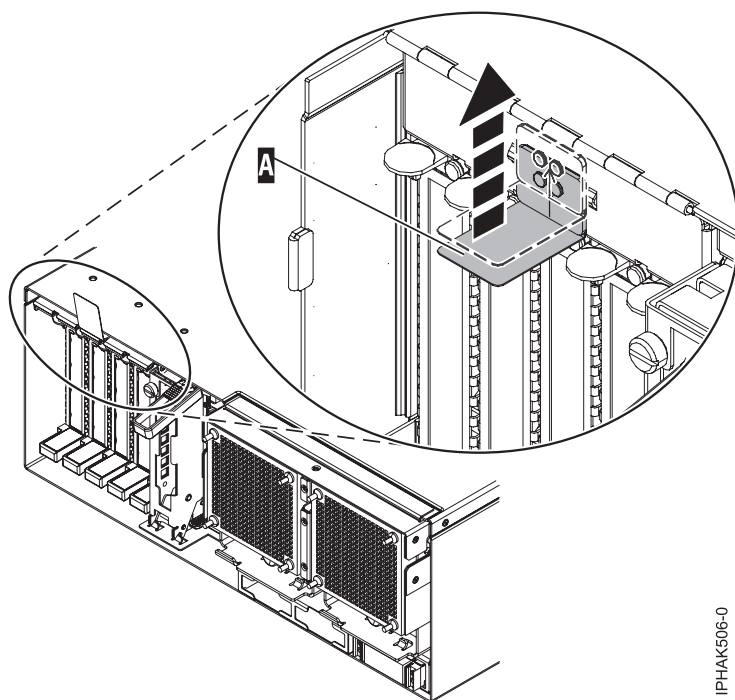
```
lsslot -c pci -a
```

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

# Slot	Description	Device(s)
U7879.001.DQD014E-P1-C1	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C4	PCI-X capable, 64 bit, 133MHz slot	Empty
U7879.001.DQD014E-P1-C5	PCI-X capable, 64 bit, 133MHz slot	Empty

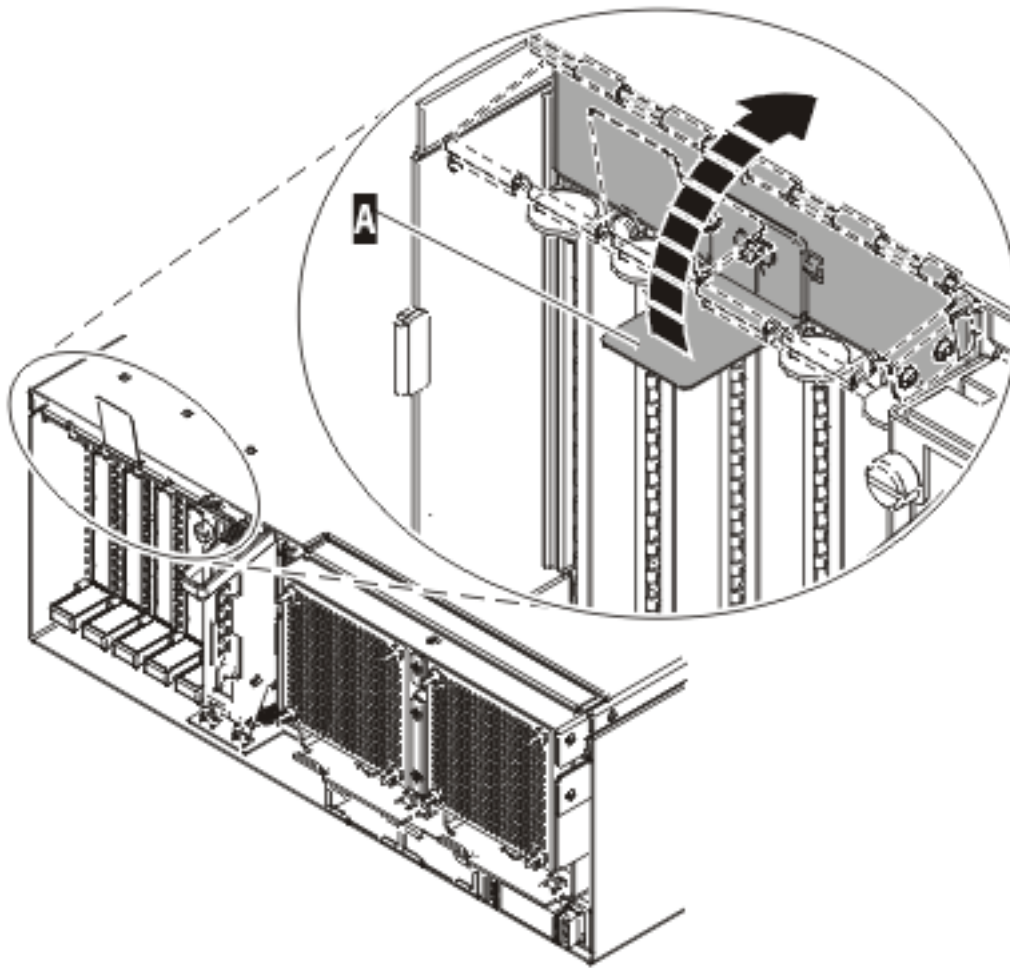
Select the appropriate empty PCI slot from the ones listed by the command.

8. Lift up the PCI adapter EMC shield **A** as shown in Figure 107 on page 155 and then rotate it up and away from the cassette as shown in Figure 108 on page 156.



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Figure 107. Lift up the EMC shield

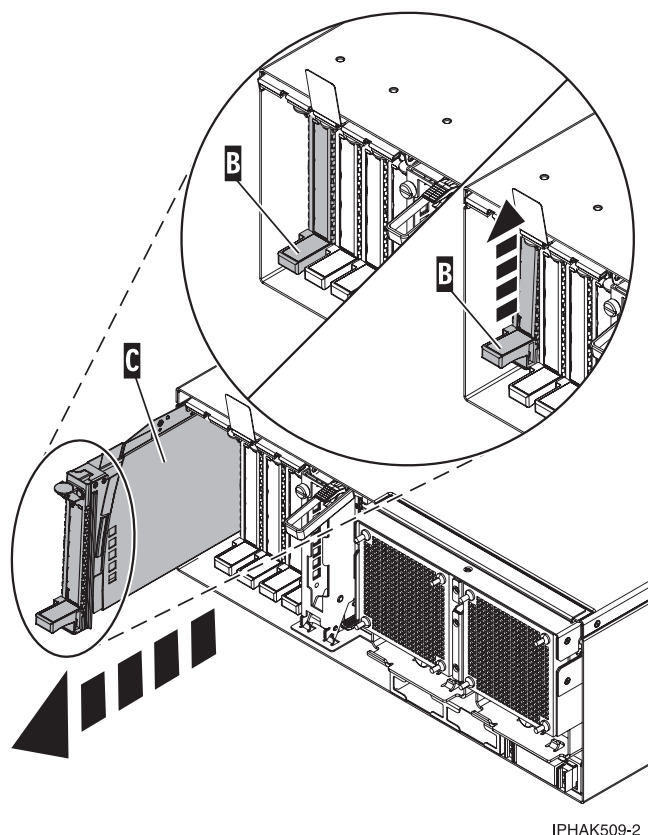


IPHAK907-0

Figure 108. Rotate the EMC shield into the open position

9. 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.





IPHAK509-2

Figure 109. PCI adapter cassette removed from the system unit

10. Install the adapter into the PCI adapter cassette using the following instructions:
  - “Place a PCI adapter in a single-width cassette” on page 195
  - “Remove an adapter from the PCI adapter single-width cassette” on page 192
11. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.
12. Run the `drslot_chrp_pci` command to enable an adapter to be installed.  
For example, to install an adapter in slot U7879.001.DQD014E-P1-C3, run:  
`drslot_chrp_pci -a -s U7879.001.DQD014E-P1-C3`

The following displays:

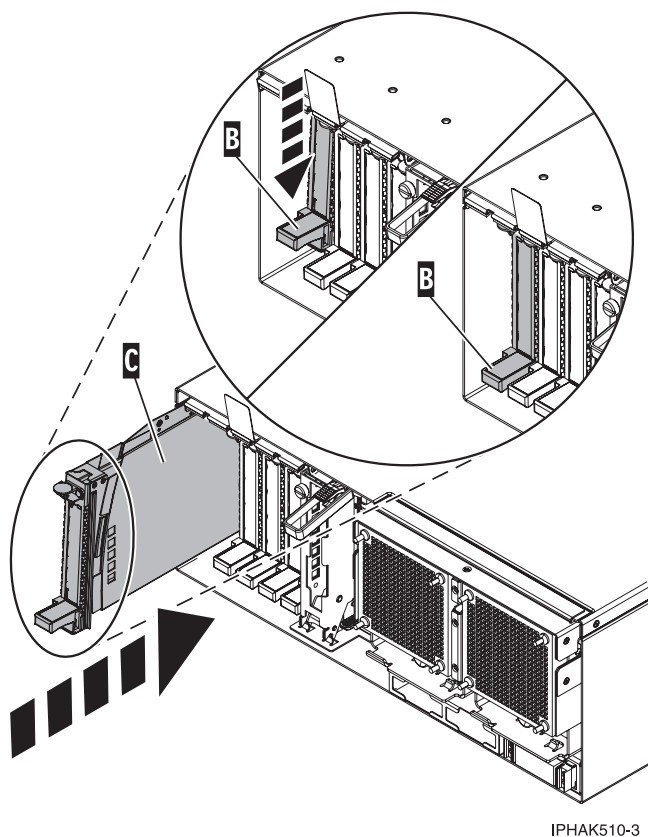
The visual indicator for the specified PCI slot has been set to the identify state. Press Enter to continue or enter x to exit.

13. Press Enter.

The following displays:

The visual indicator for the specified PCI slot has been set to the action state. Insert the PCI card into the identified slot, connect any devices to be configured and press Enter to continue. Enter x to exit.

14. Lift and hold the PCI adapter EMC shield in the open position. See Figure 107 on page 155 and Figure 108 on page 156.
15. Slide the cassette **C** into the cassette slot as shown in the following figure.
16. 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.



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Figure 110. PCI adapter cassette removed from the system unit

17. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.

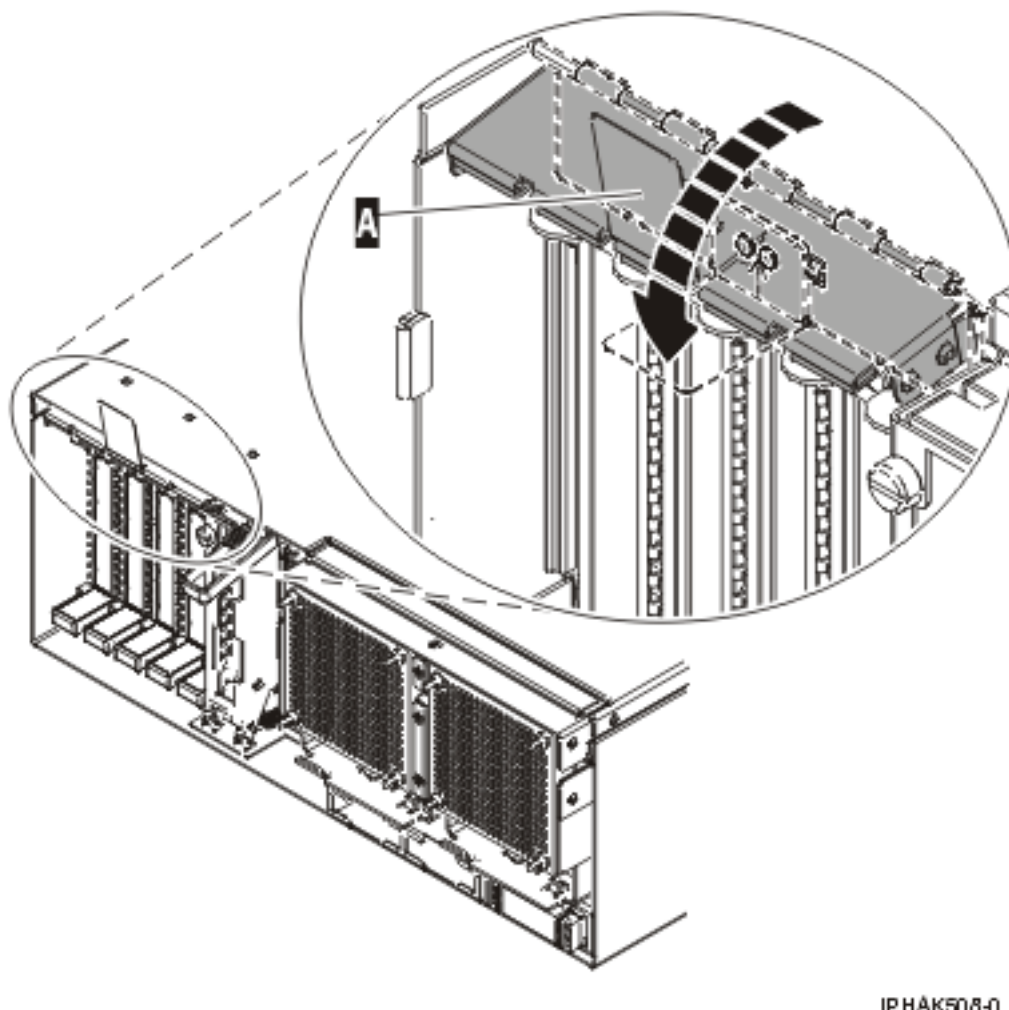


Figure 111. PCI adapter EMC shield in the closed position

18. Use the `lsslot` command to verify that U7879.001.DQD014E-P1-C3 is occupied.

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

### Install a PCI adapter contained in a cassette with the power off

You might need to install a PCI adapter with the power off. Use the procedure in this section to perform this task. You might need to install a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter. For instructions, see “Install a feature using the Hardware Management Console” on page 410.

**Note:** If the system is partitioned, select the appropriate information from the following list to learn more about working in a partitioned environment, then return here:

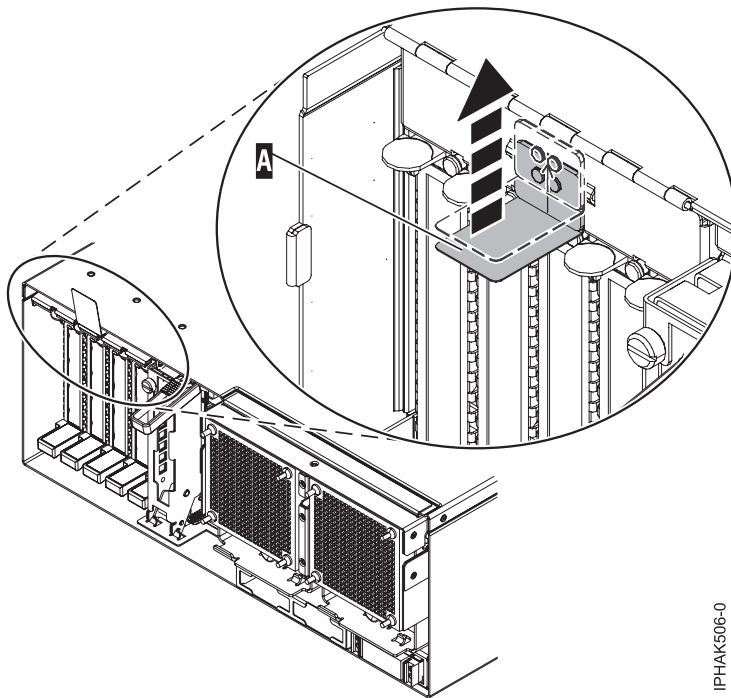
- Partitioning for AIX
- Installing new hardware for i5/OS logical partitions
- Partitioning for Linux

To install an adapter with the system power off, do the following:

1. Perform prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. To determine in which slot to place the PCI adapter, refer to “PCI adapter placement in the system unit or expansion unit” on page 209 for information regarding slot restrictions for the adapters that can be used in this system.
4. “Stop the system or logical partition” on page 399.
5. Disconnect the power source from the system by unplugging the system.

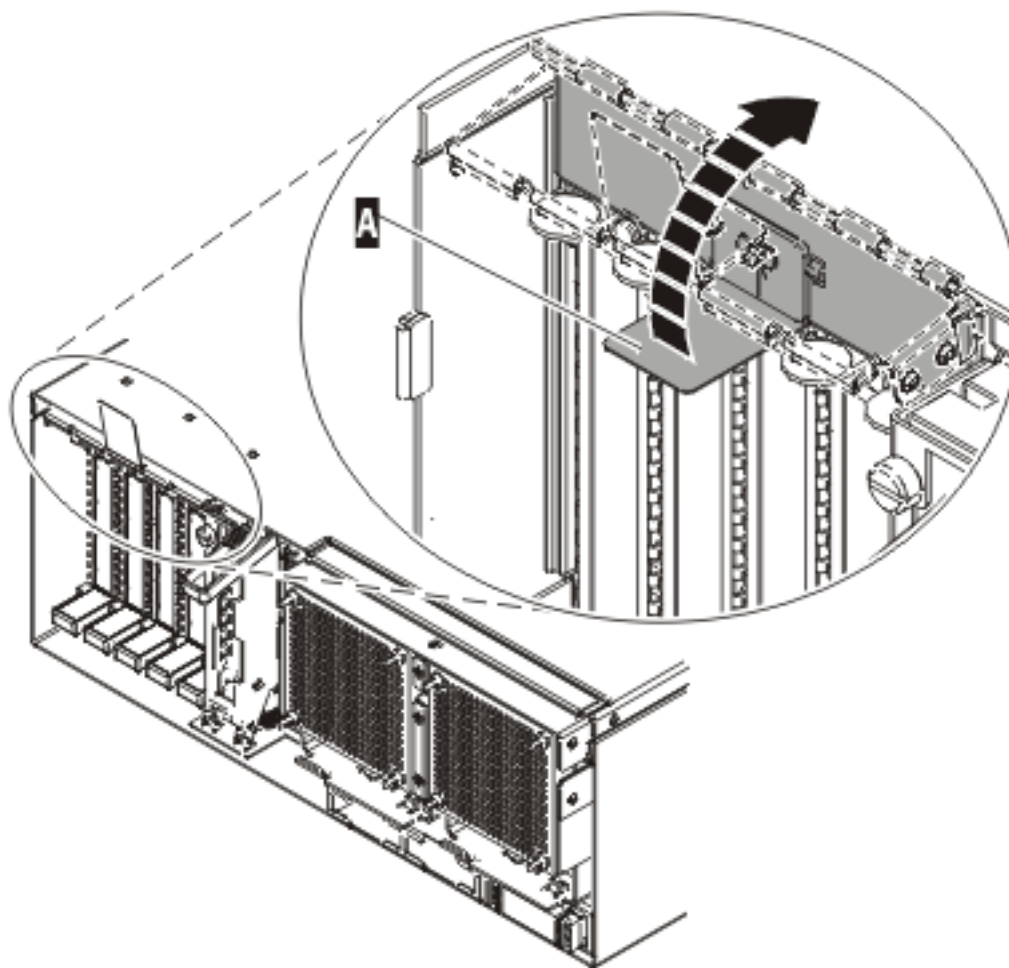
**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are installing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
7. If you are installing a PCI adapter in a stand-alone expansion unit, remove the unit’s back cover, if applicable.
8. Determine the location of PCI adapter in the system.
9. Lift up the PCI adapter EMC shield **A** as shown in Figure 112 and then rotate it up and away from the cassette as shown in Figure 113 on page 161.



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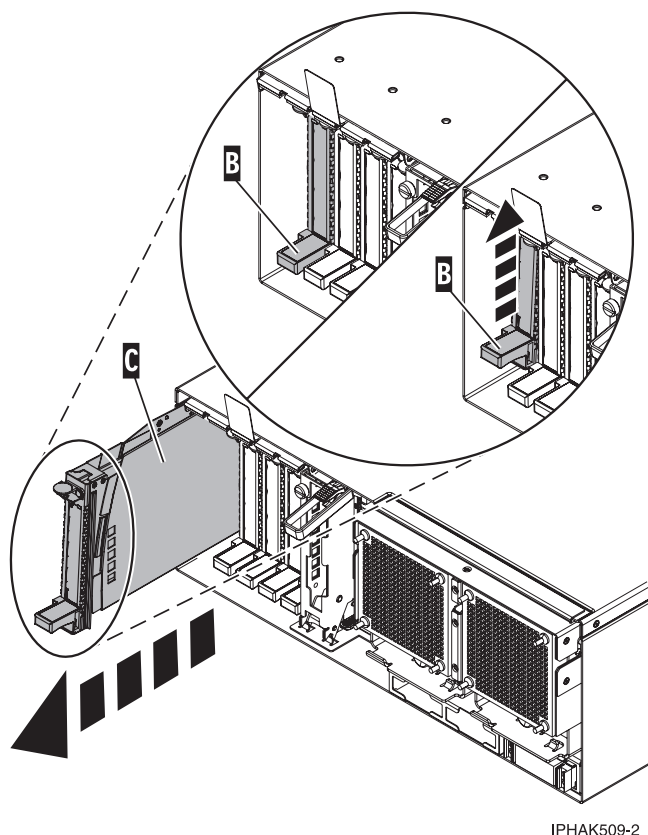
Figure 112. Lift up the EMC shield



IPHAK507-0

Figure 113. Rotate the EMC shield into the open position

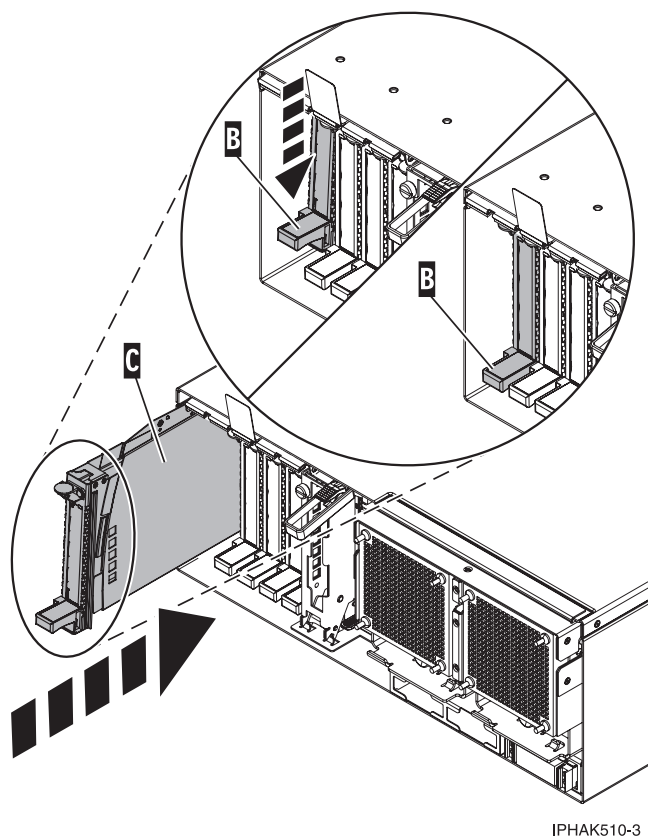
10. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.



IPHAK509-2

Figure 114. PCI adapter cassette removed from the system unit

11. Install the adapter into the PCI adapter cassette using the following instructions:
  - “Place a PCI adapter in a single-width cassette” on page 195
  - “Remove an adapter from the PCI adapter single-width cassette” on page 192
12. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.
13. Lift and hold the PCI adapter EMC shield in the open position. See Figure 112 on page 160 and Figure 113 on page 161.
14. Slide the cassette **C** into the cassette slot as shown in the following figure.
15. 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.

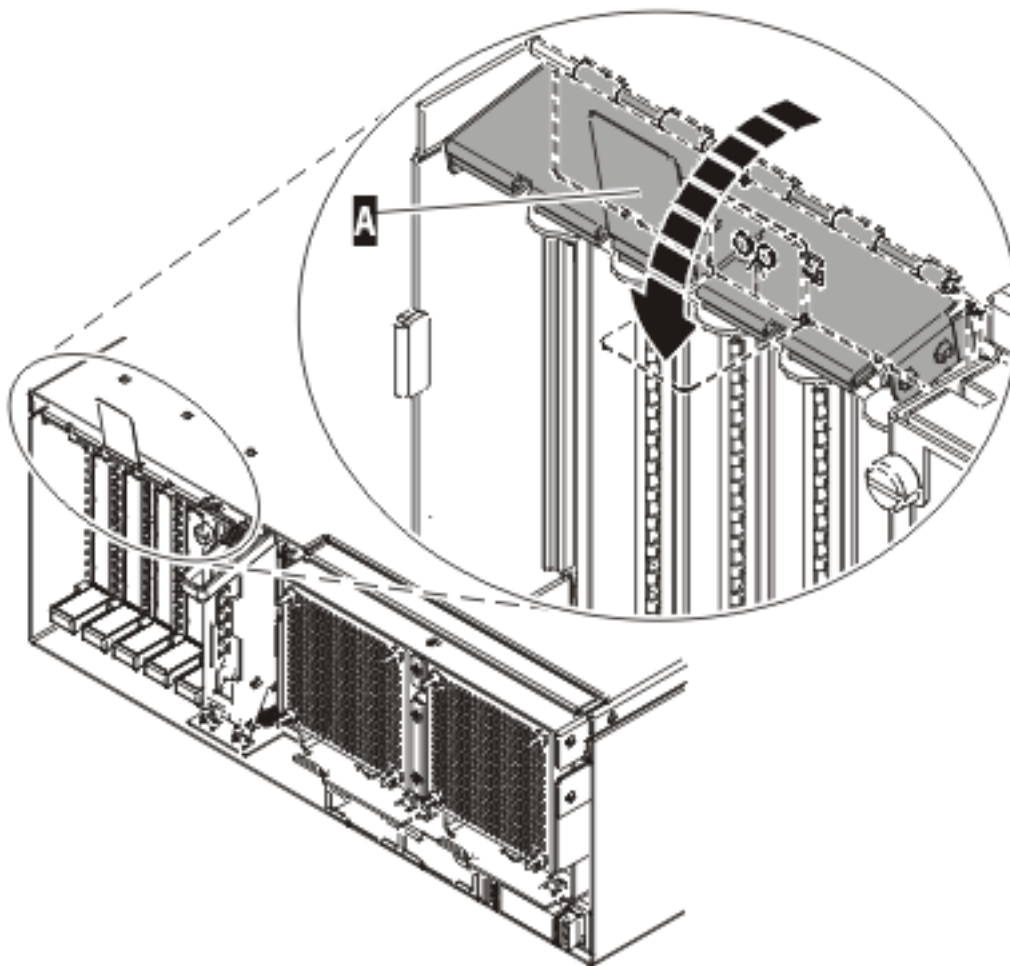


IPHAK510-3

Figure 115. PCI adapter cassette removed from the system unit

16. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.





IPHAK508-0

Figure 116. PCI adapter EMC shield in the closed position

17. "Start the system or logical partition" on page 398.
18. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Remove a PCI adapter contained in a cassette from the system

You might need to remove a PCI adapter. Use the procedure in this section to perform this task.

### Remove a PCI adapter contained in a cassette from the system with the power on in AIX

You might need to remove a PCI adapter with the system power on in AIX. Use the procedure in this section to perform this task.

Read the following notes to determine if this is the correct procedure for the task to be performed.

#### Note:

1. Use this procedure to remove a PCI adapter and leave the slot in the system unit empty. To remove a failing adapter and replace it with the same adapter, see "Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX" on page 178.
2. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, then install the adapter as described in "Install a PCI adapter contained in a cassette with the power on in AIX" on page 142.



3. Procedures performed on a PCI adapter with the system power on in AIX, 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 an adapter, do the following:

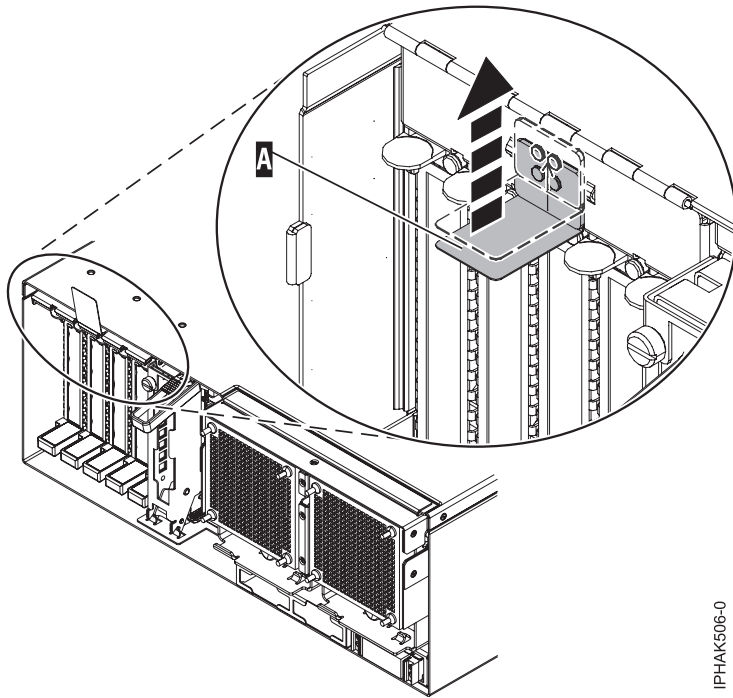
1. Perform the prerequisite tasks as described in “Before you begin” on page 336.
2. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
3. If you are removing a PCI adapter in a stand-alone expansion unit, remove the unit’s back cover, if applicable.
4. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
5. Determine the location of PCI adapter in the system.
6. Record the slot number and location of each adapter being removed.

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

7. Ensure that any processes or applications that might use the adapter are stopped.
8. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
9. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
10. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
11. At the Task Selection list, select **PCI Hot Plug Manager**.
12. Select **Unconfigure a Device**, then press Enter.
13. Press F4 (or Esc +4) to display the **Device Names** menu.
14. Select the adapter you are removing in the **Device Names** menu.
15. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The **ARE YOU SURE** screen displays.
16. 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.
17. Press F4 (or Esc +4) twice to return to the **Hot Plug Manager** menu.
18. Select **replace/remove PCI Hot Plug adapter**.
19. Select the slot that has the device to be removed from the system.
20. Select **remove**.

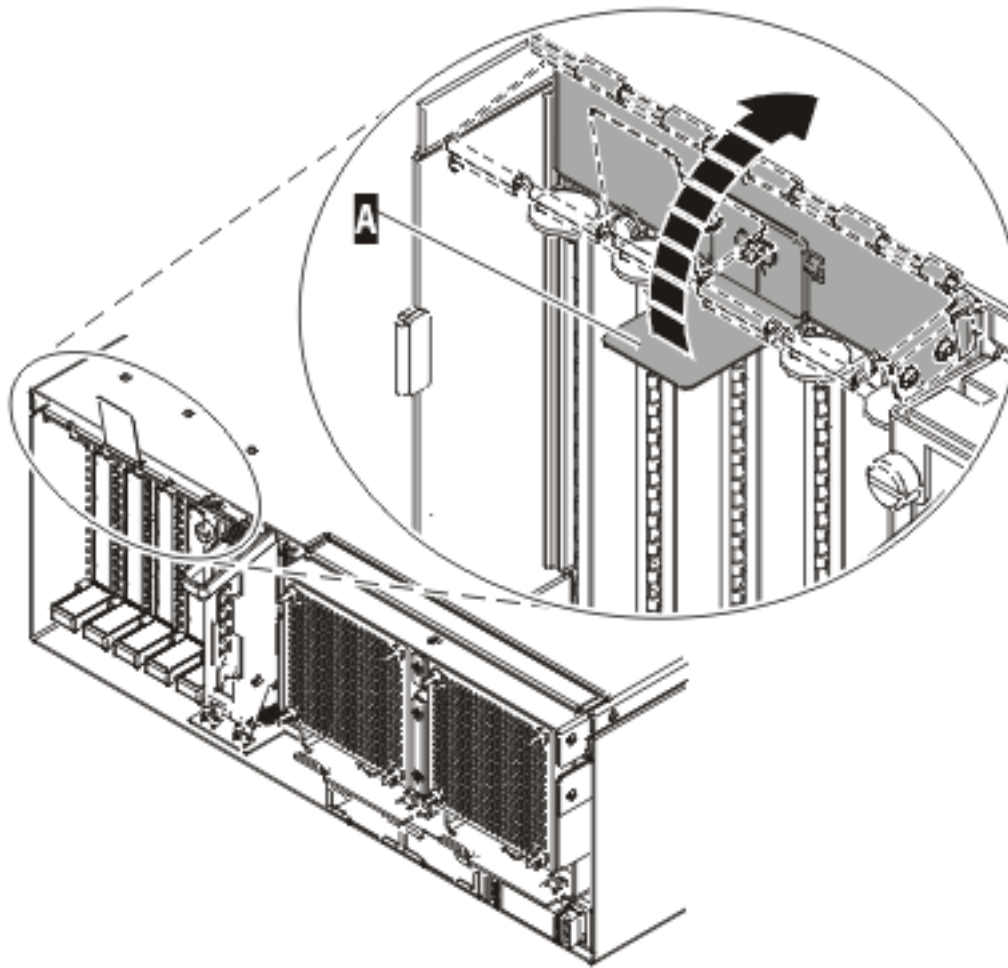
**Note:** A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

21. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
22. Label, and then disconnect all cables attached to the adapter you plan to remove.
23. Before handling any PCI adapter, see “Handling static-sensitive devices” on page 327.
24. Lift up the PCI adapter EMC shield **A** as shown in Figure 117 on page 166 and then rotate it up and away from the cassette as shown in Figure 118 on page 167.



IPHAK506-0

Figure 117. Lift up the EMC shield

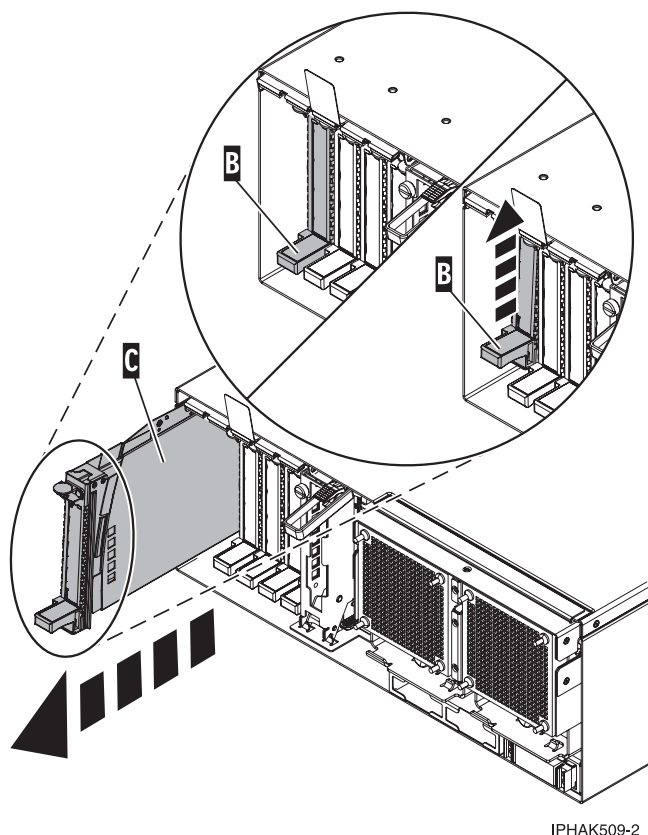


IPHAK507-0

Figure 118. Rotate the EMC shield into the open position

25. 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 119. PCI adapter cassette removed from the system unit

26. Place the cassette with the cover facing up on an approved ESD surface.

**Note:** The cover will have a label on it.

27. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the Command field at the top of the screen.
28. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 22 on page 165.

OR

If you do not have other adapters to remove, continue with the next step.

29. Press F10 to exit the Hot-Plug Manager.
30. Run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
31. Place an empty cassette into the unused PCI slot for proper air flow. The procedure is complete.
  - To remove the adapter from the PCI adapter cassette, see "Remove an adapter from the PCI adapter single-width cassette" on page 192.
  - To install an adapter in the system, see "Install a PCI adapter contained in a cassette with the power on in AIX" on page 142.

## Remove a PCI adapter contained in a cassette from the system with the power on in i5/OS

You might need to remove a PCI adapter with the system power on in i5/OS. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

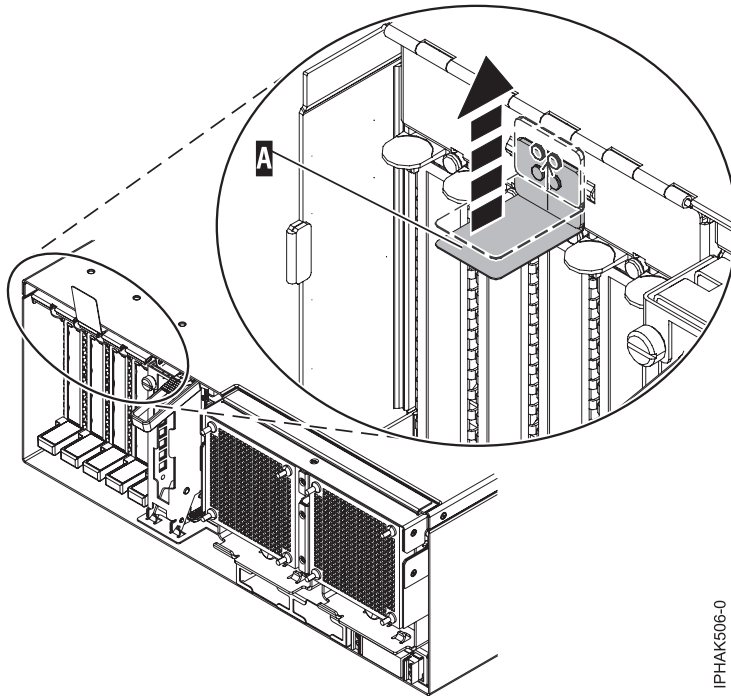
**Important:**

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To remove an adapter, do the following:

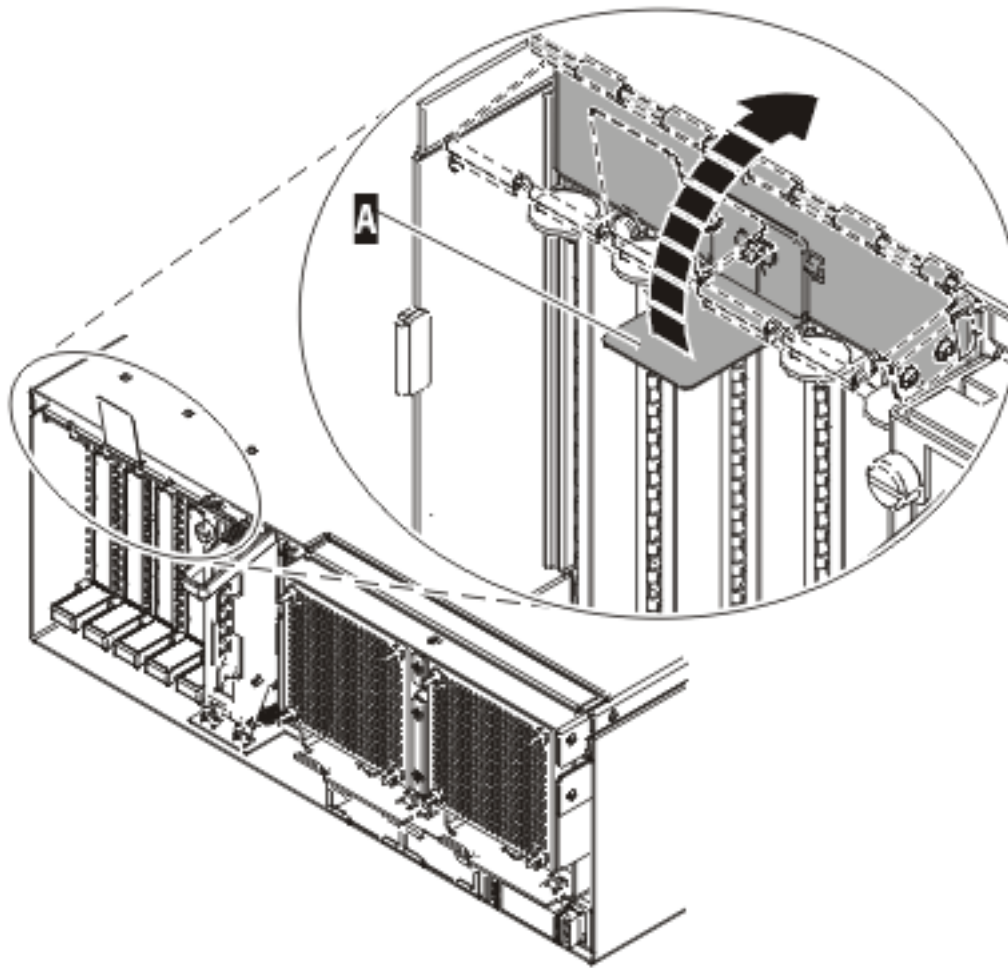
1. Perform the prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable. For instructions see the *Related information* links at the end of the page.
4. If you are removing a PCI adapter in a stand-alone expansion unit, remove the unit’s back cover, if applicable.
5. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
6. Determine the location of PCI adapter in the system.
7. Type **strsst** on the command line of the Main Menu and then press Enter.
8. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display and press Enter.
9. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
10. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
11. Type **9** (Hardware contained within package) in the *System Unit* or *Expansion Unit* field of the unit where you are removing the card. Press Enter.
12. Select the option to **Include empty positions**.
13. Select **Concurrent Maintenance** on the card position where you want to remove the card and then press Enter.
14. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
15. Select the option to **Toggle LED blink off/on** to stop the blinking LED.

16. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
17. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power off complete
18. Lift up the PCI adapter EMC shield **A** as shown in Figure 120 and then rotate it up and away from the cassette as shown in Figure 121 on page 171.



IPHAK506-0

Figure 120. Lift up the EMC shield



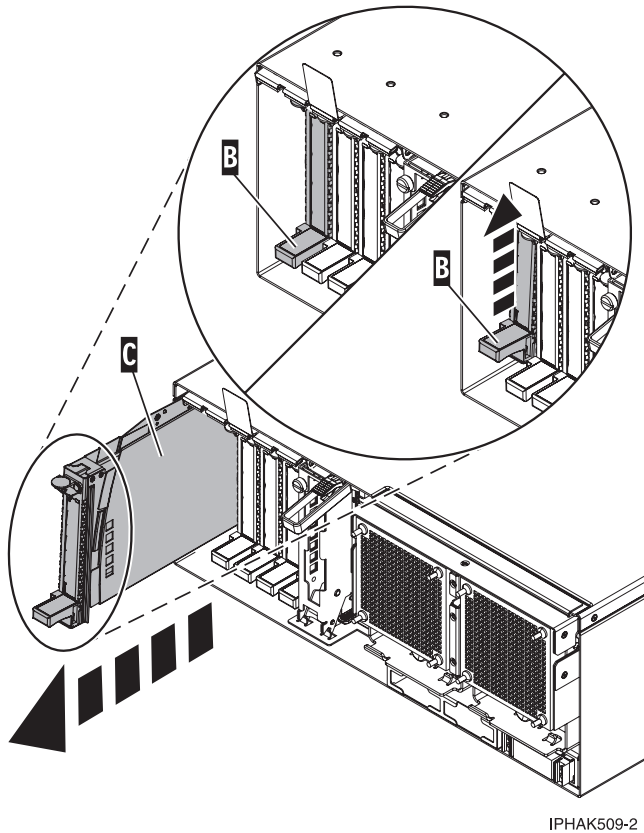
IPHAK507-0

Figure 121. Rotate the EMC shield into the open position

19. 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 122. PCI adapter cassette removed from the system unit

20. Place the cassette with the cover facing up on an approved ESD surface.

**Note:** The cover will have a label on it.

21. To remove the adapter from the PCI adapter cassette, see “Remove an adapter from the PCI adapter single-width cassette” on page 192.

To replace the adapter in the system, see “Replace a PCI adapter contained in a cassette in the system” on page 177.

## Remove a PCI adapter contained in a cassette from the system with the power on in Linux

You might need to remove a PCI adapter with the system power on in Linux. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

To remove an adapter, do the following:

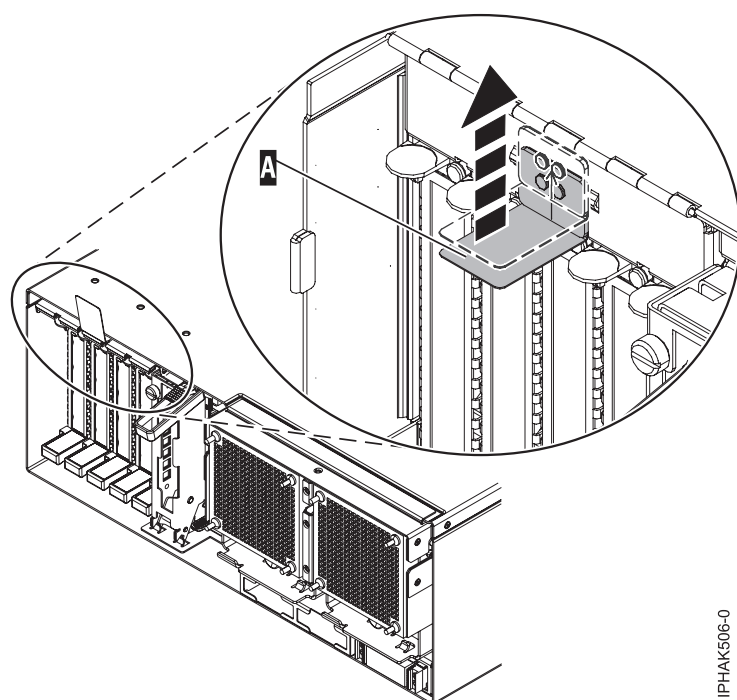
1. Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 333.
2. “Verify that the Linux, hot-plug PCI tools are installed” on page 334.
3. Perform the prerequisite tasks as described in “Before you begin” on page 336.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.



5. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
6. If you are removing a PCI adapter in a stand-alone expansion unit, remove the unit's back cover, if applicable.
7. If you are removing a failing PCI adapter, see "Identify a failing part" on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
8. Determine the location of PCI adapter in the system.
9. Label, and then disconnect all cables attached to the adapter you plan to remove.
10. Run the `drslot_chrp_pci` command to enable an adapter to be removed:  
 For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:  

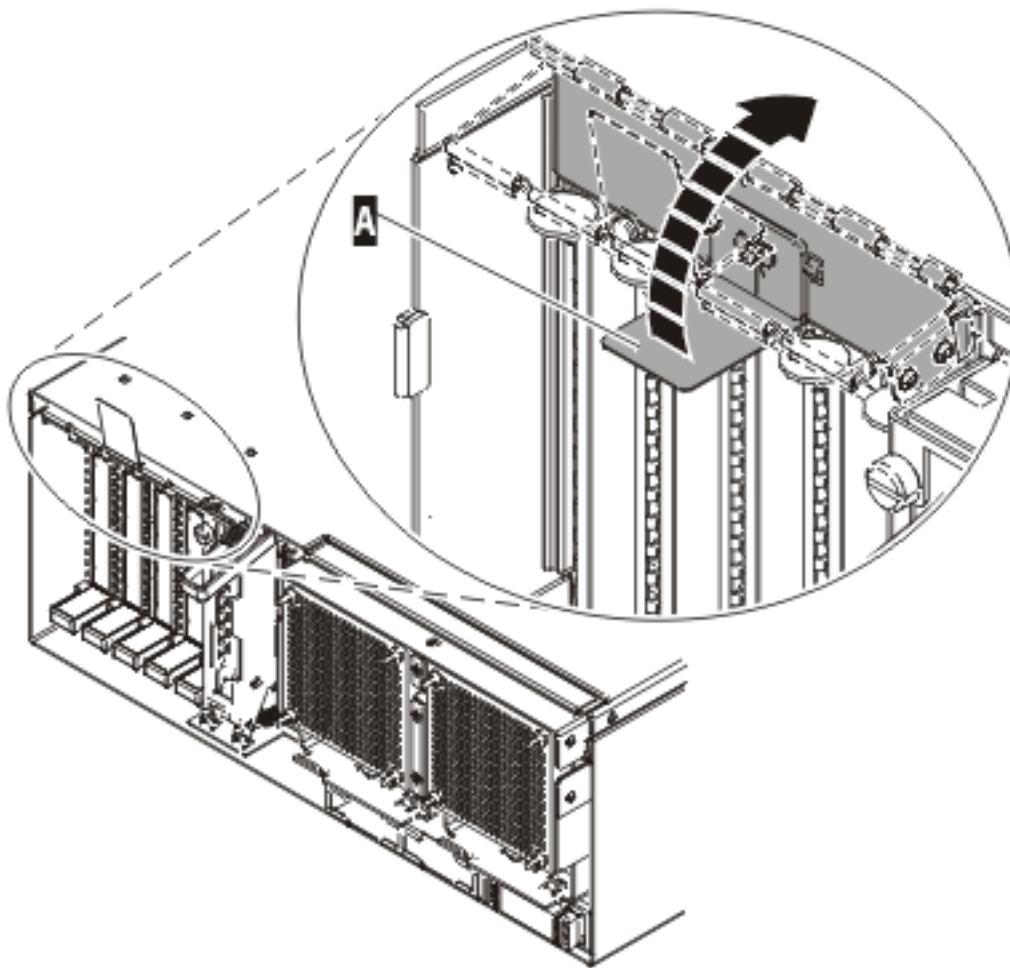
```
drslot_chrp_pci -r -s U7879.001.DQD014E-P1-C3
```

 Follow the instructions on the display to complete the task.
11. Lift up the PCI adapter EMC shield **A** as shown in Figure 123 and then rotate it up and away from the cassette as shown in Figure 124 on page 174.



IPHAK506-0

Figure 123. Lift up the EMC shield

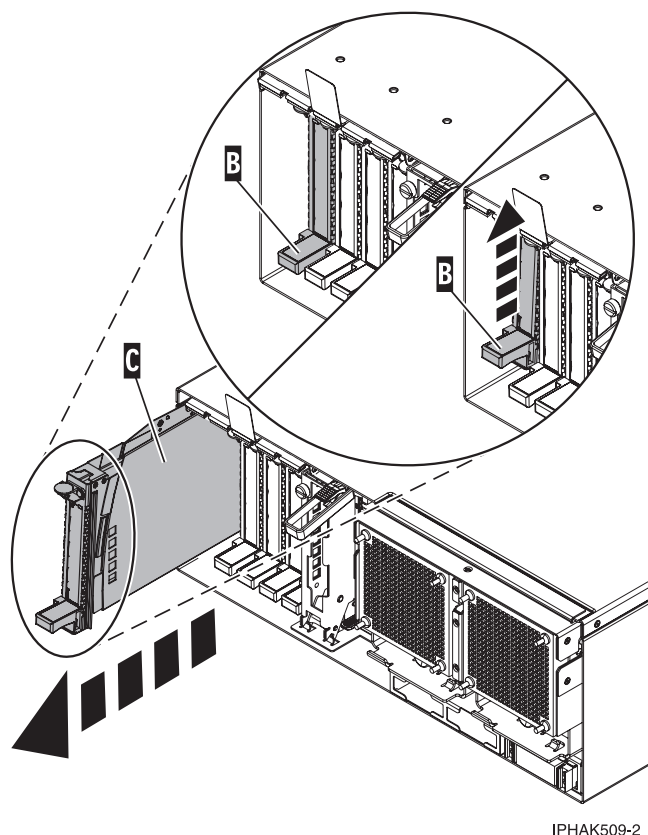


IPHAK507-0

Figure 124. Rotate the EMC shield into the open position

12. 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 125. PCI adapter cassette removed from the system unit

13. Place the cassette with the cover facing up on an approved ESD surface.

**Note:** The cover will have a label on it.

14. “Remove an adapter from the PCI adapter single-width cassette” on page 192.

To replace the adapter in the system, see “Replace a PCI adapter contained in a cassette in the system with the power on in Linux” on page 188.

### Remove a PCI adapter contained in a cassette from the system with the system power off

You might need to remove a PCI adapter with the system power off. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a PCI adapter. For instructions, see “Remove a part using the Hardware Management Console” on page 411.

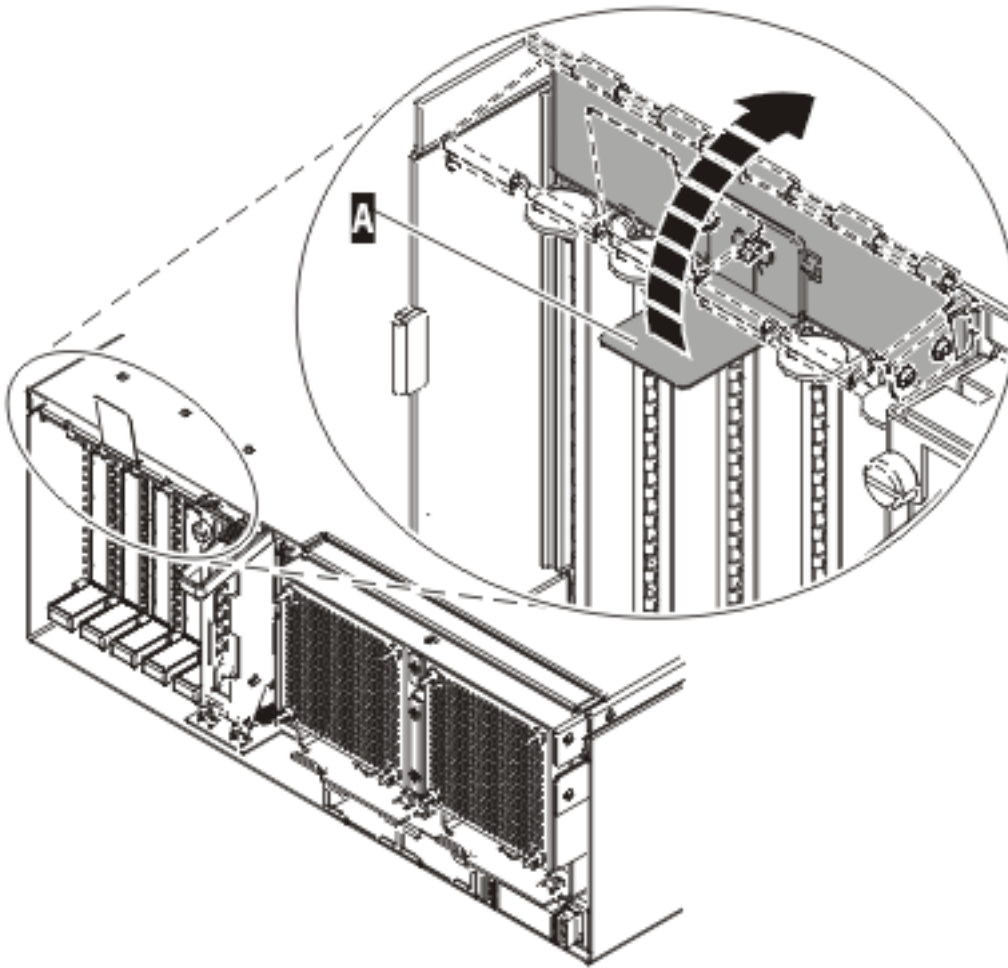
To remove an adapter, do the following:

1. Perform the prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing a failing PCI adapter, see “Identify a failing part” on page 401. If you are removing the PCI adapter for other reasons, continue to the next step.
4. “Stop the system or logical partition” on page 399.

5. Disconnect the power source from the system by unplugging the system.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

6. If you are removing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable.
7. If you are removing a PCI adapter in a stand-alone expansion unit, remove the units back cover, if applicable.
8. Determine the location of PCI adapter in the system.
9. Lift and hold the PCI adapter EMC shield **A** in the open position.

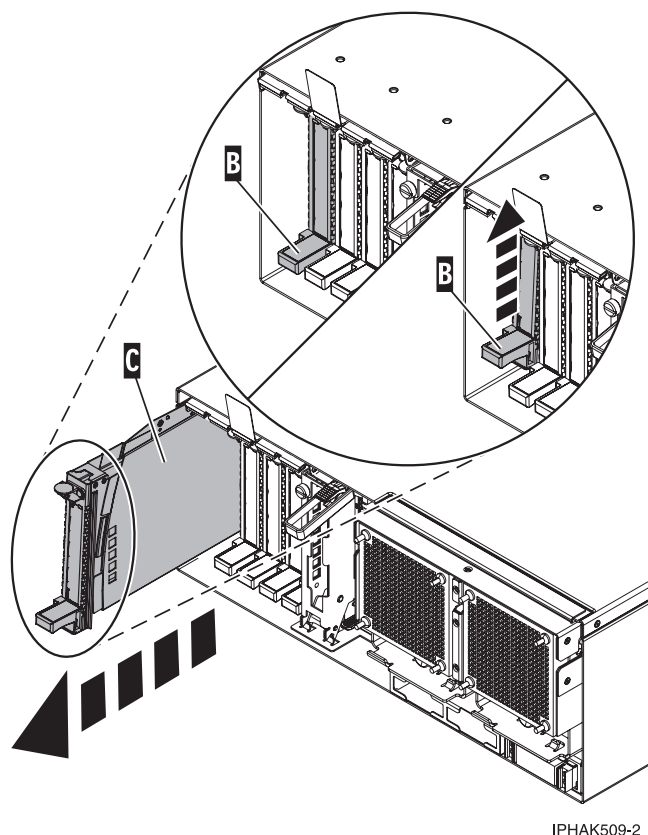


IPHAKF07-0

Figure 126. PCI adapter EMC shield in the open position

10. 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 127. PCI adapter cassette removed from the system unit

11. Place the cassette with the cover facing up on an approved ESD surface.

**Note:** The cover will have a label on it.

12. “Remove an adapter from the PCI adapter single-width cassette” on page 192.

To replace the adapter in the system, see “Replace a PCI adapter contained in a cassette in the system.”

## Replace a PCI adapter contained in a cassette in the system

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you

are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## Remove and replace a PCI adapter contained in a cassette in the system with the power on in AIX

You might need to replace a PCI adapter with the system power on in AIX. Use the procedure in this section to perform this task.

### Important:

1. Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.
2. If you plan to remove a failing adapter and leave the slot empty, see “Remove a PCI adapter contained in a cassette from the system with the power on in AIX” on page 164.
3. This procedure should not be used to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in “Remove a PCI adapter contained in a cassette from the system with the power on in AIX” on page 164, then install the new adapter as described in “Install a PCI adapter contained in a cassette with the power on in AIX” on page 142.
4. Procedures performed on a PCI adapter with the system power on in AIX, 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 an adapter, do the following:

1. Perform the prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If you are removing and replacing a PCI adapter in a rack-mounted system or expansion unit, follow these steps:
  - a. Open the rear rack door.
  - b. Remove the units cover or covers if applicable. For instructions see the *Related information* links at the end of the page.
4. If you are removing and replacing a PCI adapter in a stand-alone expansion unit, remove the units back cover, if applicable. For instructions see the *Related information* links at the end of the page.
5. Determine the location of the PCI adapter in the system.
6. Record the slot number and location of each adapter being removed.

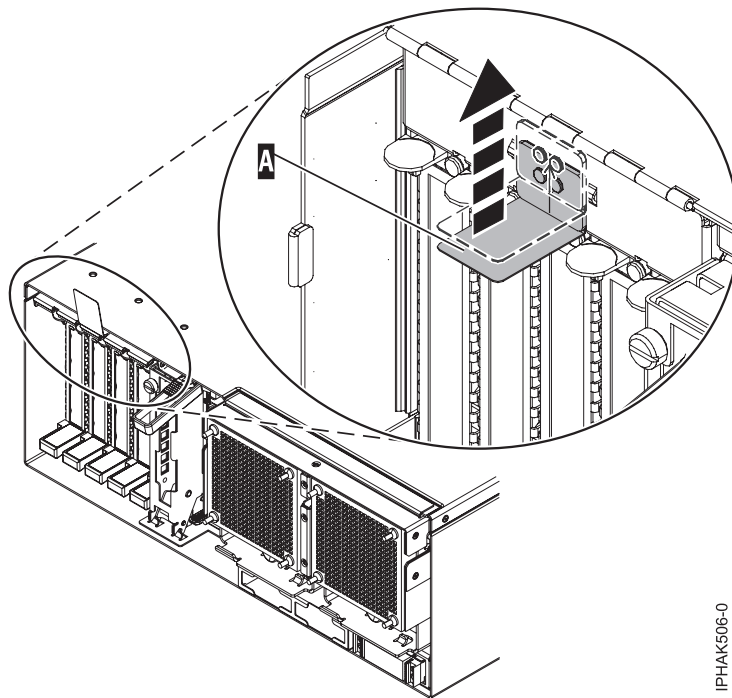
**Note:** Adapter slots are numbered on the rear of the system unit.

7. Ensure that any processes or applications that might use the adapter are stopped.
8. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
9. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
10. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
11. At the Task Selection list, select **PCI Hot Plug Manager**.
12. Select **Unconfigure a Device**, then press Enter.
13. Press F4 (or Esc +4) to display the **Device Names** menu.
14. Select the adapter you are removing in the **Device Names** menu.

15. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The **ARE YOU SURE** screen displays.
16. 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.
17. Press F3 (or Esc +3) twice to return to the **Hot Plug Manager** menu.
18. Select **replace/remove PCI Hot Plug adapter**.
19. Select the slot that has the device to be removed from the system.
20. Select **Replace**.

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

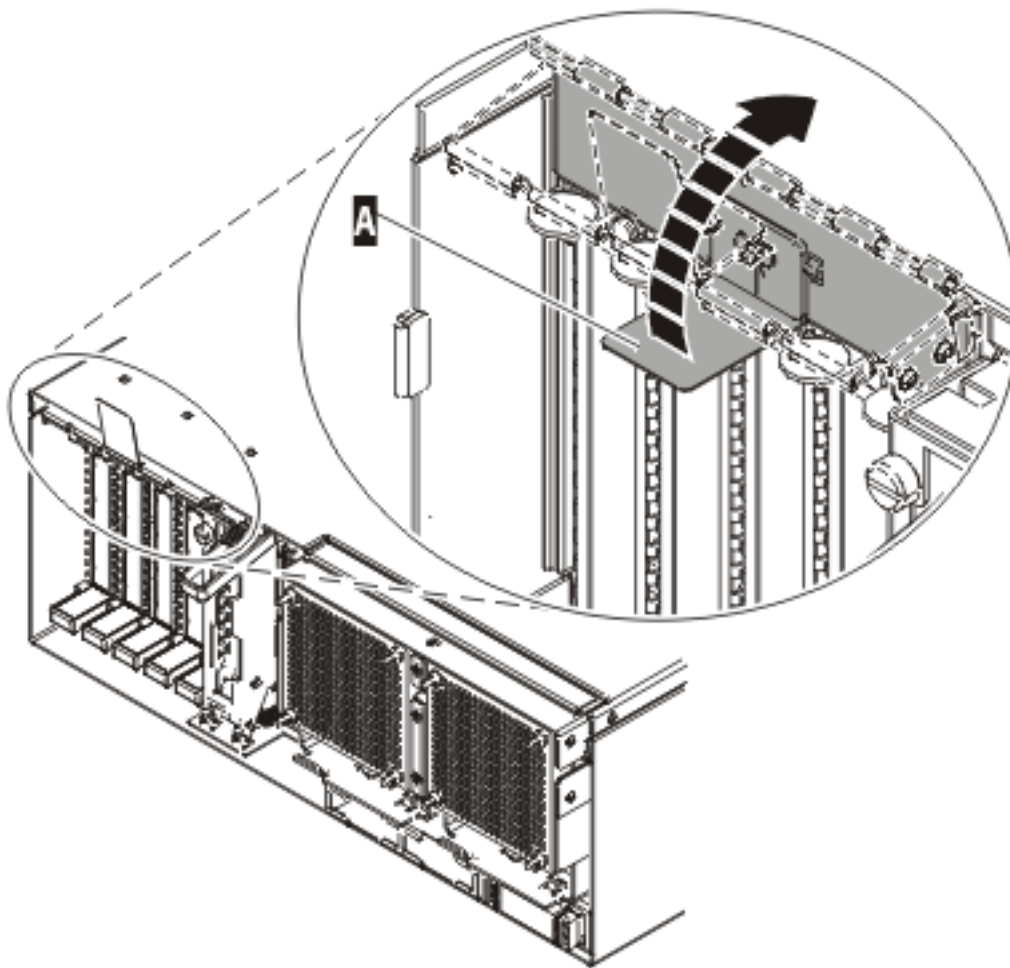
21. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
22. Label, and then disconnect all cables attached to the adapter you plan to remove.
23. Lift up the PCI adapter EMC shield **A** as shown in Figure 128 and then rotate it up and away from the cassette as shown in Figure 129 on page 180.



IPHAK506-0

Figure 128. Lift up the EMC shield





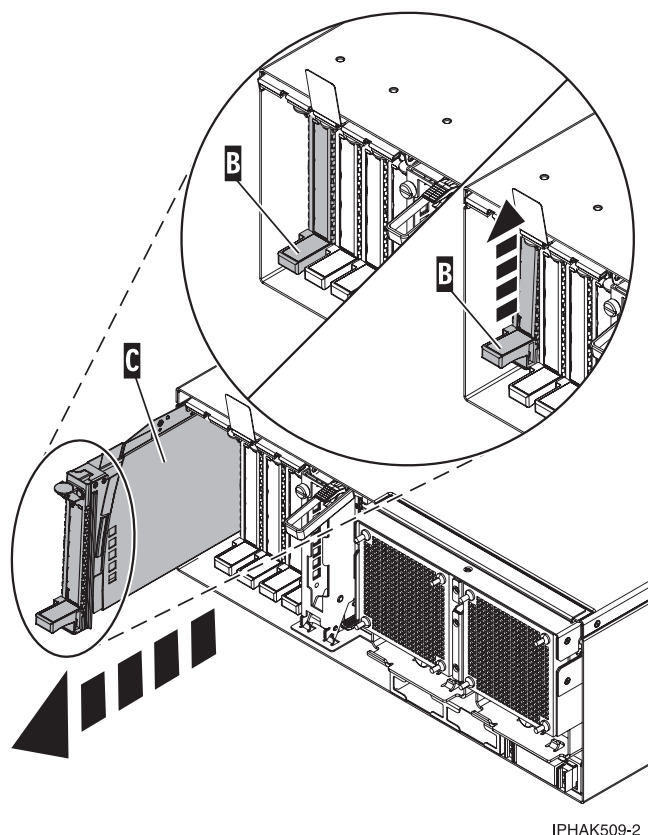
IPHAK507-0

Figure 129. Rotate the EMC shield into the open position

24. 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 130. PCI adapter cassette removed from the system unit

25. Place the cassette with the cover facing up on an approved ESD surface.

**Note:** The cover will have a label on it.

26. Install the replacement adapter into the PCI adapter cassette using the following instructions:
  - “Place a PCI adapter in a single-width cassette” on page 195
  - “Remove an adapter from the PCI adapter single-width cassette” on page 192
27. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
28. 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.
29. Lift and hold the PCI adapter EMC shield in the open position. See Figure 128 on page 179 and Figure 129 on page 180.
30. Slide the cassette **C** into the cassette slot as shown in the following figure.
31. 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.

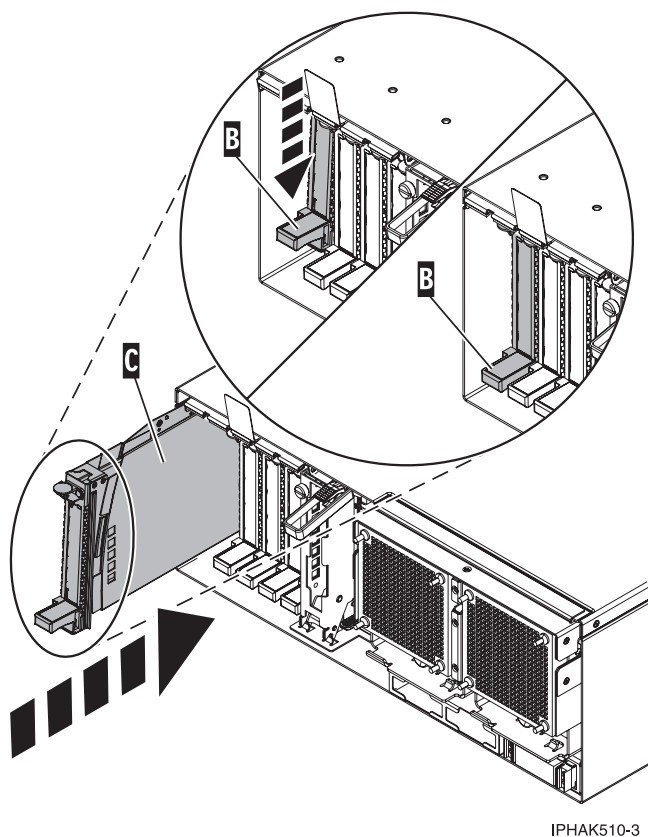
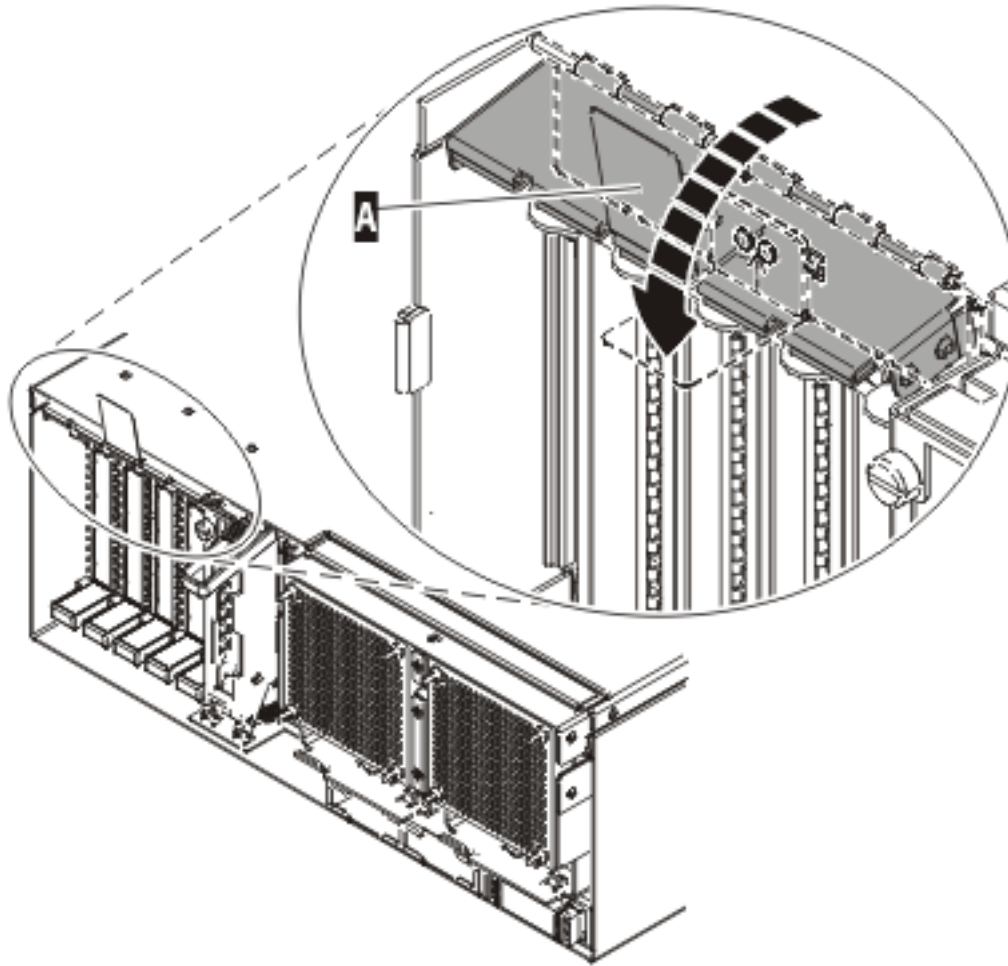


Figure 131. PCI adapter cassette removed from the system unit



IP HAK508-0

Figure 132. PCI adapter EMC shield in the closed position

34. 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.
35. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
36. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
37. Select **Log Repair Action**.
38. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.
39. Press F3 (or Esc+3) to return to **TASK Selection List**.
40. Select **Hot Plug Task**, press enter.
41. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.
42. Select the device just replaced from the list, then press Enter. The device is now configured.
43. Press the F10 key to exit the diagnostic program.

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

44. 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, log in 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.

45. Press the F10 key to exit the diagnostic program.

## Replace a PCI adapter contained in a cassette in the system with the power on in i5/OS

You might need to replace a PCI adapter with the system power on in i5/OS. Use the procedure in this section to perform this task. You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

**Attention:** You must have already completed the procedure “Remove a PCI adapter contained in a cassette from the system with the power on in i5/OS” on page 168 in order to have the slot powered off.

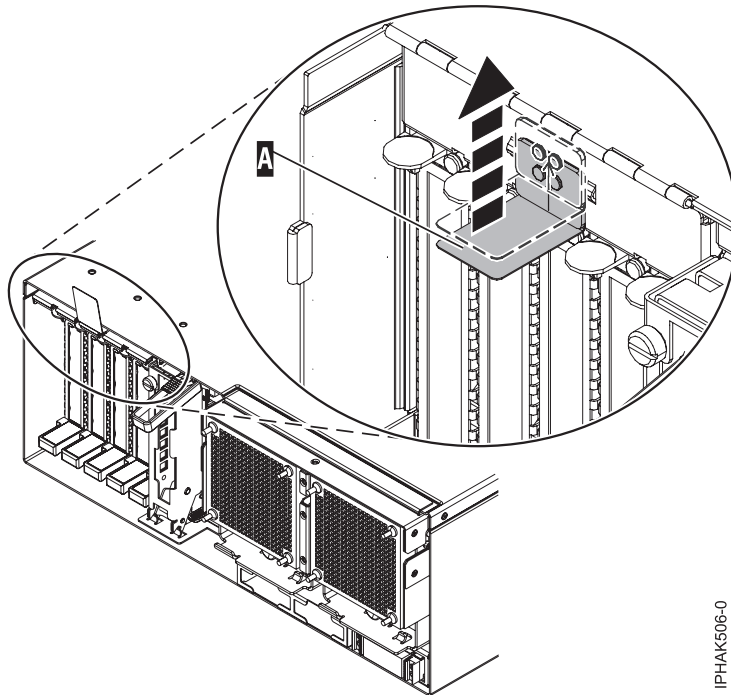
### Important:

- If the adapter is the load source IOA or the load source IOP, or any other storage IOA or IOP with critical DASD attached for the system or partition, follow the on-screen instructions when you use HSM to power down the IOP or IOA. Instructions to use functions 68 and 69 on the control panel will be included.
- If the adapter is the console IOA or the console IOP for the system or partition, you must perform the maintenance from an i5/OS session connected through a different IOA or IOP, or you must power down the partition to perform maintenance.
- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

To replace an adapter, do the following:

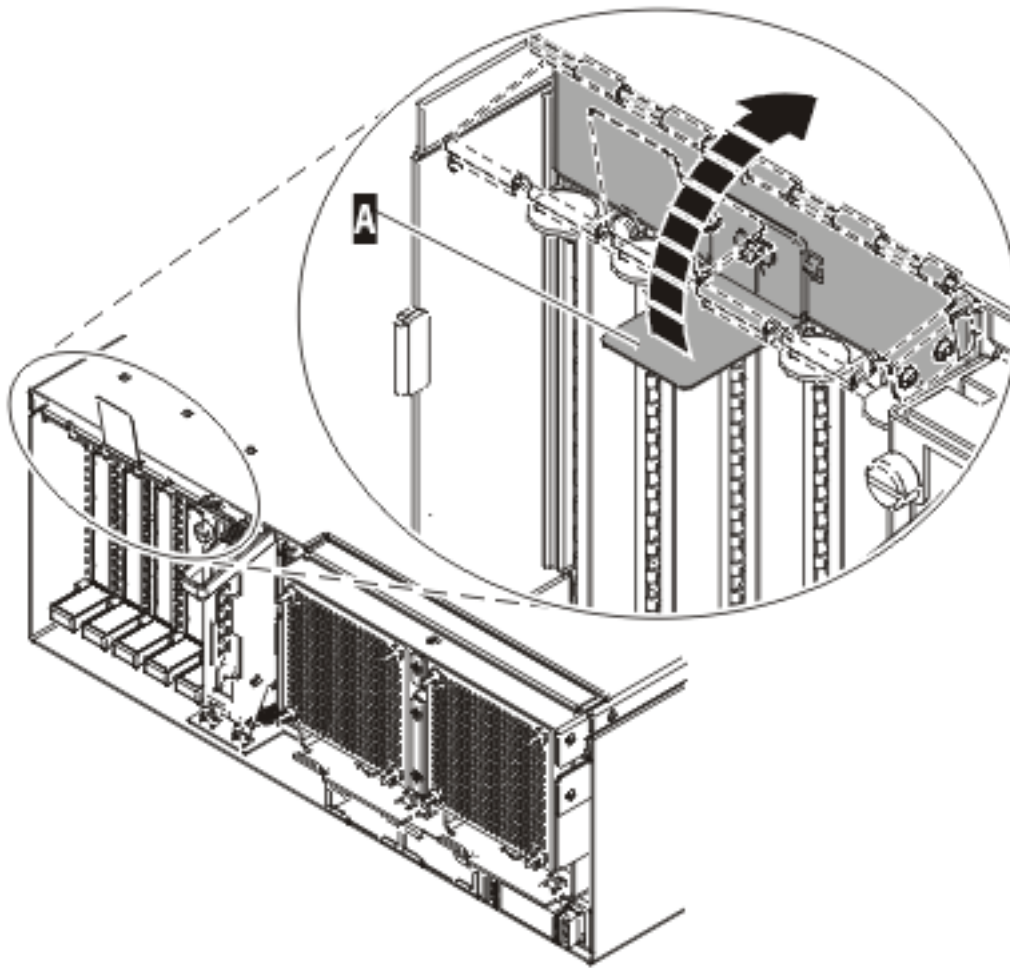
1. Perform prerequisite tasks as described in “Before you begin” on page 336.

2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If the adapter needs to be placed in the PCI adapter cassette, see “Place a PCI adapter in a single-width cassette” on page 195.
4. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
5. 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.
6. Lift up the PCI adapter EMC shield **A** as shown in Figure 133 and then rotate it up and away from the cassette as shown in Figure 134 on page 186.



IPHAK506-0

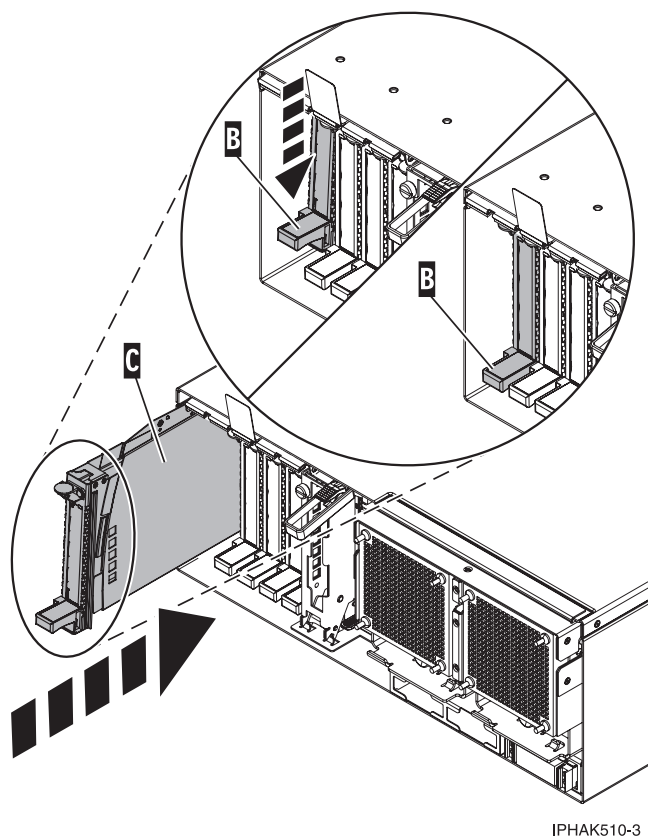
Figure 133. Lift up the EMC shield



IPHAK907-0

Figure 134. Rotate the EMC shield into the open position

7. Slide the cassette **C** into the cassette slot as shown in the following figure.
8. 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.

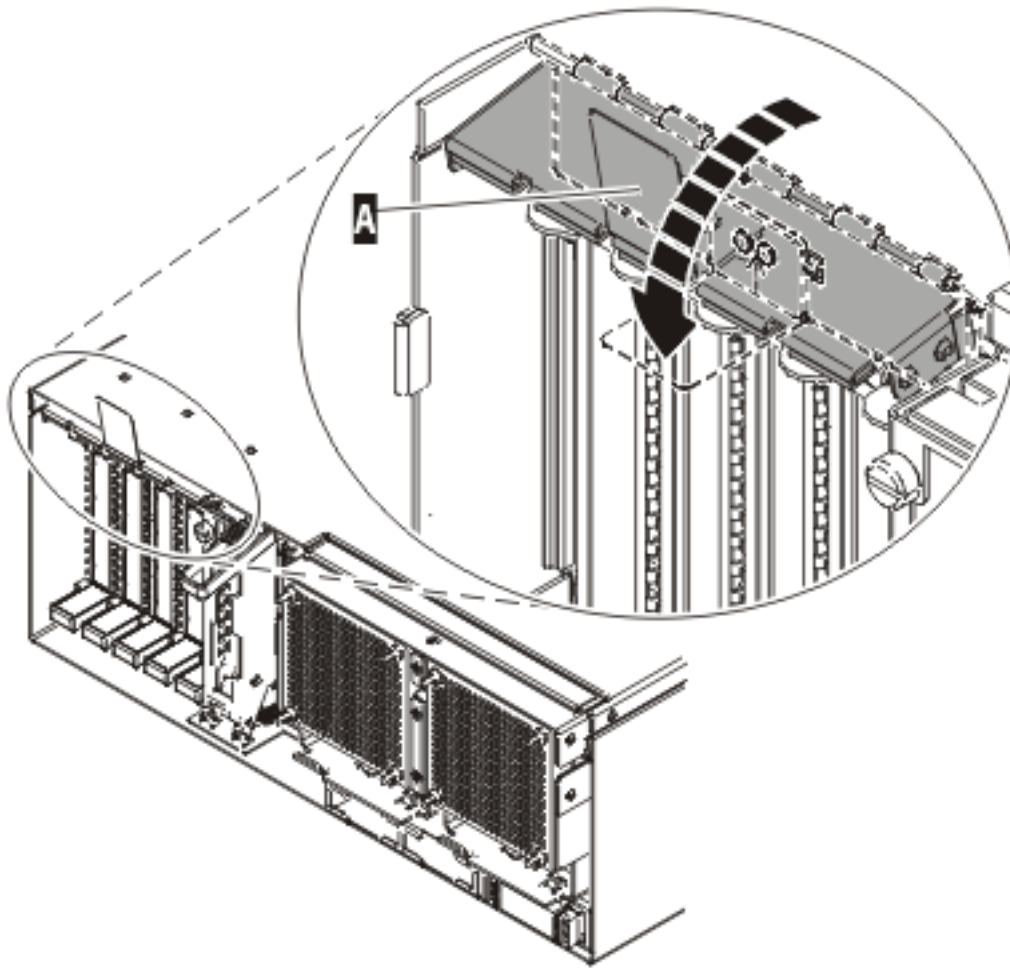


IPHAK510-3

Figure 135. PCI adapter cassette removed from the system unit

9. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.





IPHAK508-0

Figure 136. PCI adapter EMC shield in the closed position

10. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
11. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
12. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
13. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## Replace a PCI adapter contained in a cassette in the system with the power on in Linux

You might need to replace a PCI adapter. Use the procedure in this section to perform this task.

You must have already completed the procedure "Remove a PCI adapter contained in a cassette from the system with the power on in Linux" on page 172 in order to have the slot powered off.

**Note:** Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, go to "Remove a PCI adapter contained in a cassette from the system with the power on in Linux" on page 172 and "Install a PCI adapter contained in a cassette with the power on in Linux" on page 154.

To replace an adapter with the power on in Linux, do the following:



1. Perform prerequisite tasks as described in “Before you begin” on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If the adapter needs to be placed in the PCI adapter cassette, see “Place a PCI adapter in a single-width cassette” on page 195.
4. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
5. 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.
6. Run the `drslot_chrp_pci` command to enable an adapter to be replaced:  
For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:  
`drslot_chrp_pci -R -s U7879.001.DQD014E-P1-C3`  
Follow the instructions on the display to complete the task.  
When you are instructed to insert the adapter in the adapter slot, lift and hold the PCI adapter EMC shield **A** in the open position. See Figure 126 on page 176.
7. Slide the cassette **C** into the cassette slot as shown in the following figure.
8. 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.

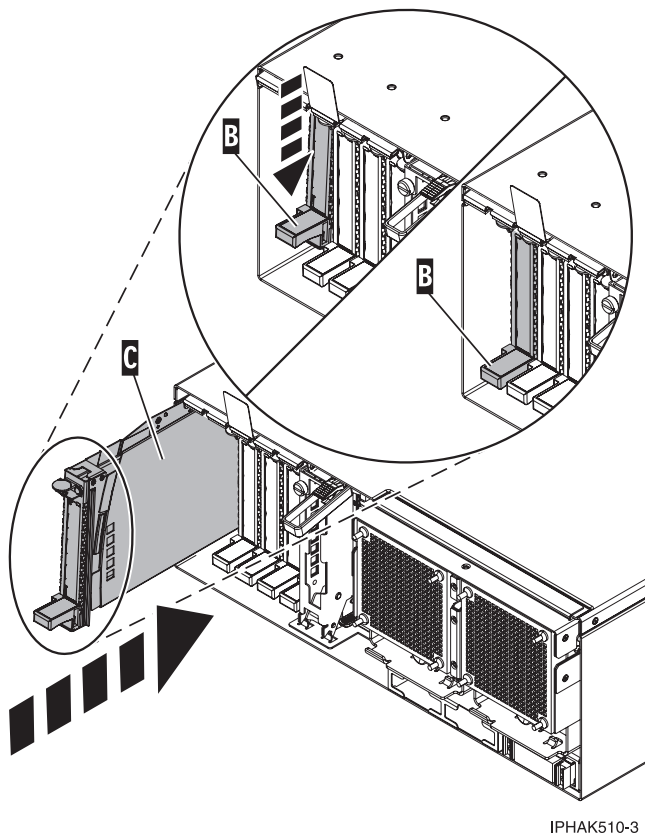


Figure 137. PCI adapter cassette removed from the system unit

9. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.

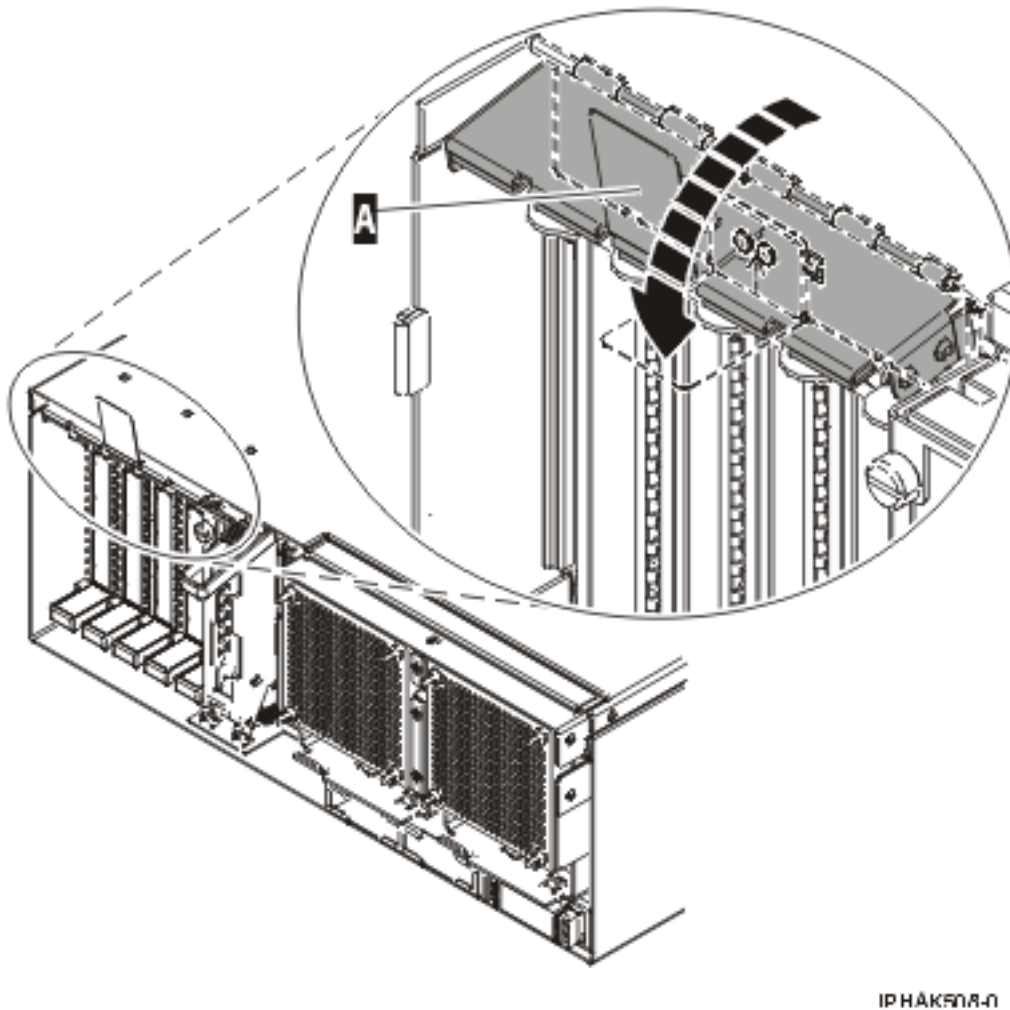


Figure 138. PCI adapter EMC shield in the closed position

10. 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

### Replace a PCI adapter contained in a cassette in the system with the system power off

You might need to replace a PCI adapter with the system power off. Use the procedure in this section to perform this task.

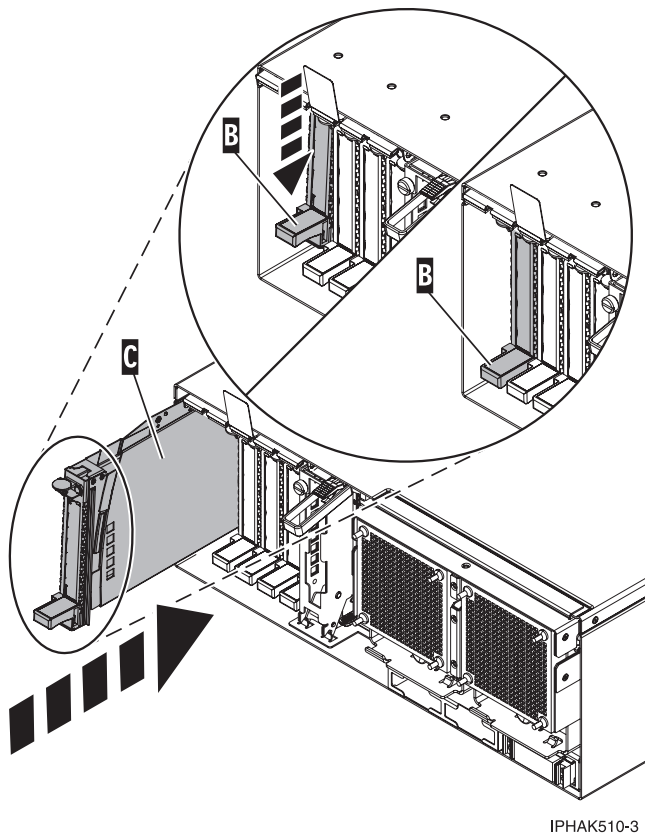
**Attention:** You must have already completed the procedure “Remove a PCI adapter contained in a cassette from the system with the system power off” on page 175 in order to have the slot powered off.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a PCI adapter. For instructions, see “Replace a part using the Hardware Management Console” on page 412.

To replace an adapter with the system power off, do the following:

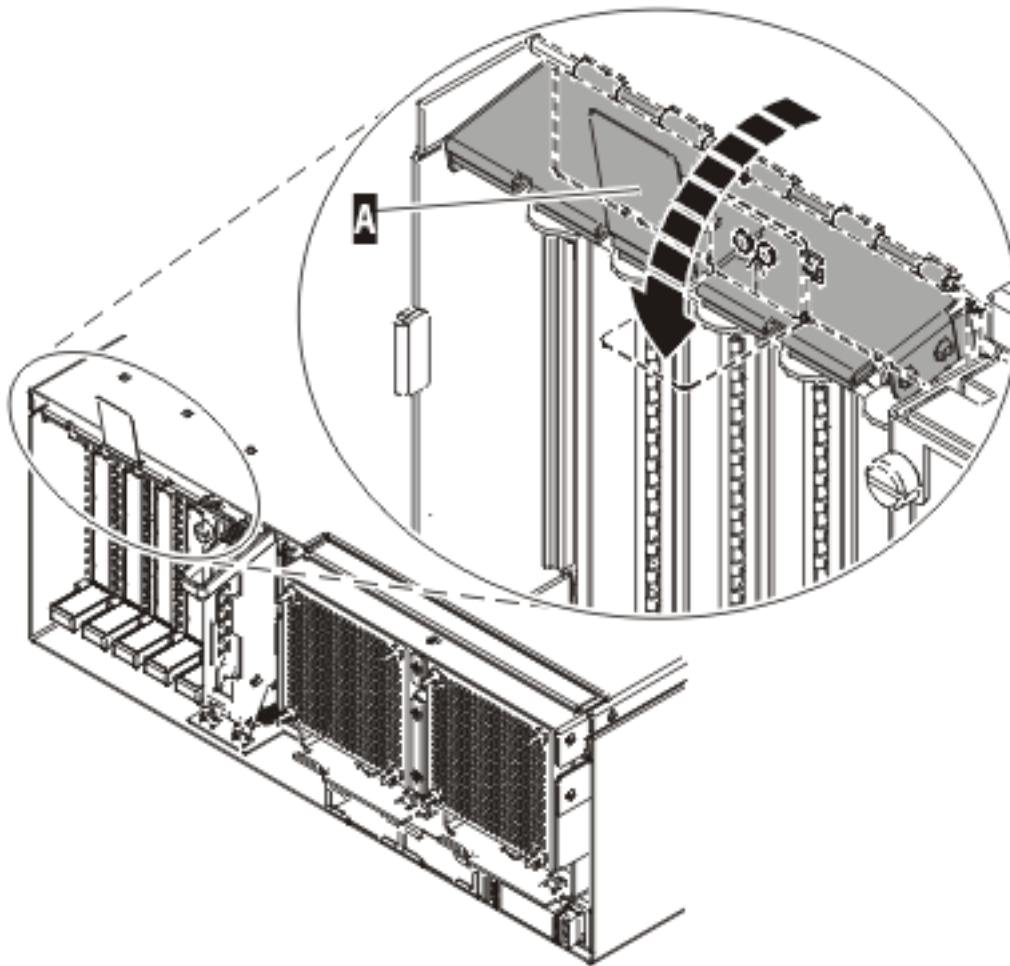
1. Perform prerequisite tasks as described in “Before you begin” on page 336.

2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 326 and “Handling static-sensitive devices” on page 327.
3. If the adapter needs to be placed in the PCI adapter cassette, see “Place a PCI adapter in a single-width cassette” on page 195.
4. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
5. 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.
6. Lift and hold the PCI adapter EMC shield **A** in the open position. See Figure 126 on page 176.
7. Slide the cassette **C** into the cassette slot as shown in the following figure.
8. 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 139. PCI adapter cassette removed from the system unit*

9. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IP HAK508-0

Figure 140. PCI adapter EMC shield in the closed position

10. Reconnect the system to the power source.
11. "Start the system or logical partition" on page 398.
12. Verify that the new resource is functional. Refer to "Verify the installed part" on page 404.

## PCI adapter single-width cassette

You might need to remove, replace, or install PCI adapters in a single-width cassette. Use the procedures in this section to perform these tasks.

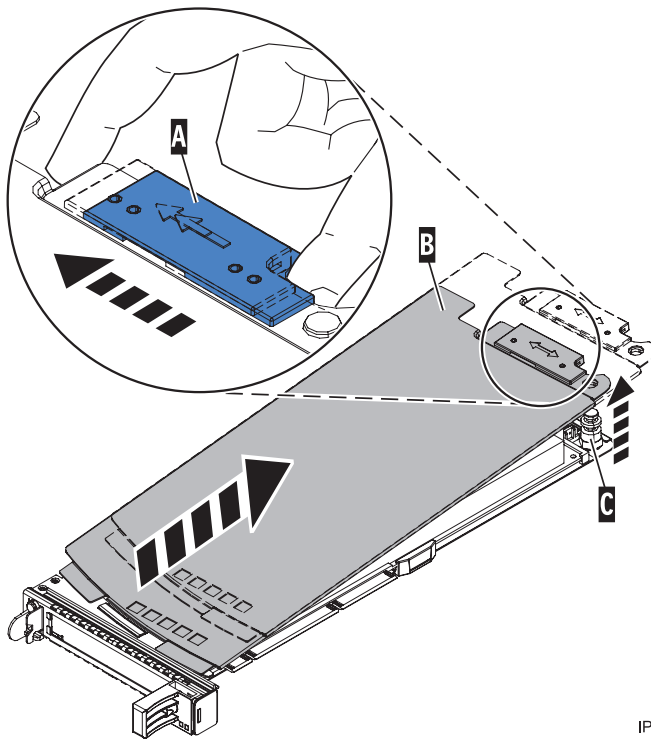
### Remove an adapter from the PCI adapter single-width cassette

You might need to remove a PCI adapter from a single-width cassette. Use the procedure in this section to perform this task.

To remove an adapter from the single-width cassette, do the following:

1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 326 and "Handling static-sensitive devices" on page 327.
3. "Remove a PCI adapter contained in a cassette from the system" on page 164.
4. Remove the cassette cover by doing the following:

- a. Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
- b. Lift the cover **B** off the pivot pin.
- c. Slide the cover off the cassette.



IPHA520-0

Figure 141. PCI adapter cassette cover removed

5. Remove the adapter from the cassette by doing the following:
  - a. Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 142 on page 194.

**Note:**

- 1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
  - 2) 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.
  - 3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
  - 4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- b. Push the adapter retainers **B** away from the adapter.
  - c. Unlock the adapter tailstock clamp **C**.
  - d. 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.
  - e. Lift the adapter out of the tailstock retaining channel.

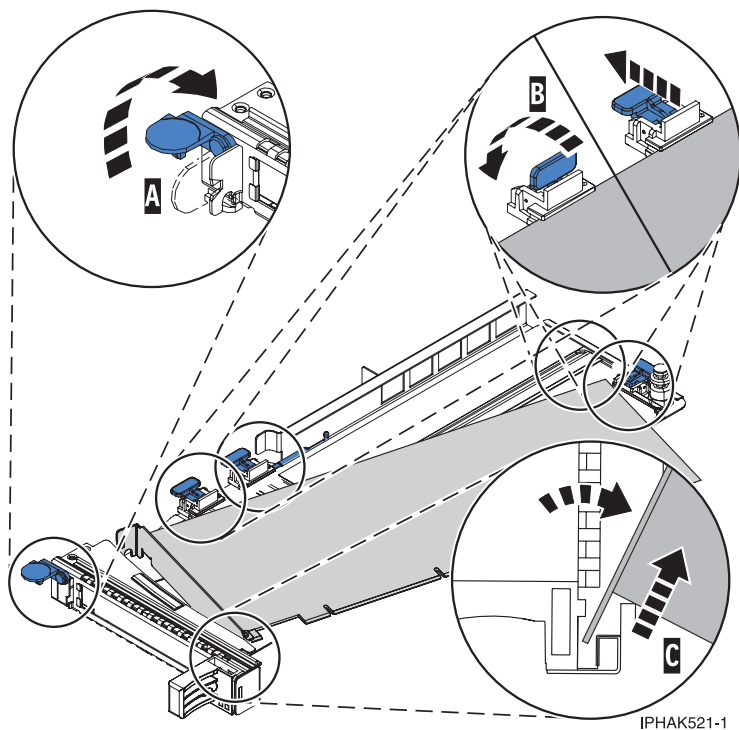


Figure 142. Adapter removed from the PCI adapter cassette

- f. Put the adapter in a safe place.

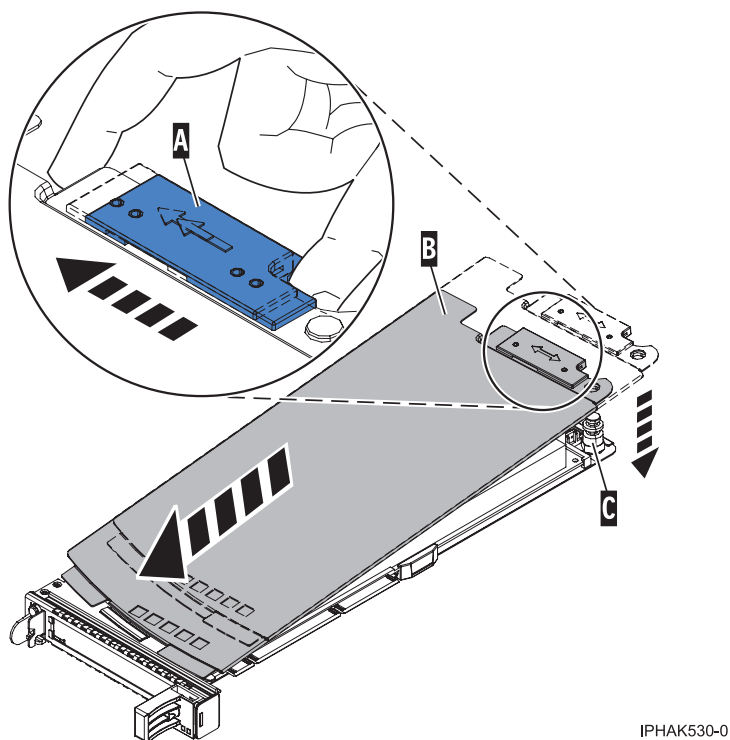
**Attention:** A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

- g. "Place a PCI adapter in a single-width cassette" on page 195.

**Note:** If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- h. Replace the cassette cover by doing the following:

- 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.



IPHA530-0

Figure 143. PCI adapter cassette cover replaced

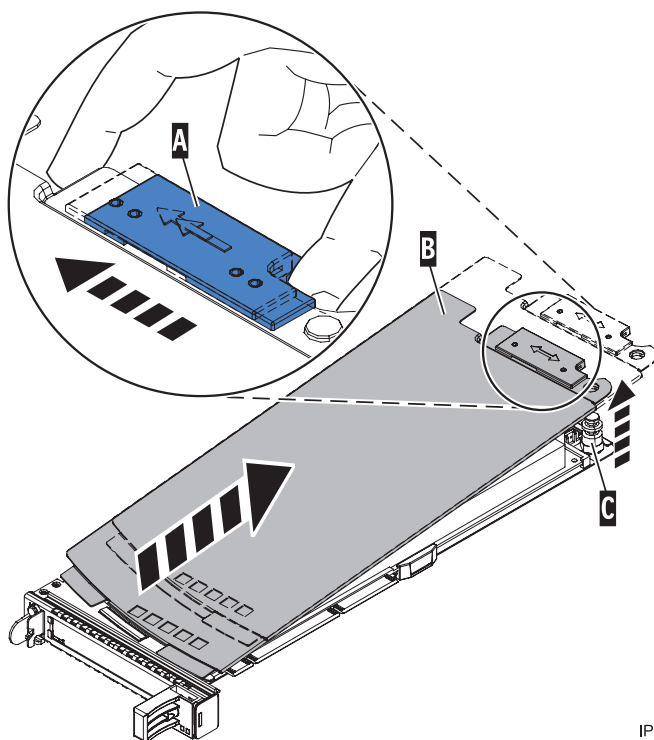
- i. "Replace a PCI adapter contained in a cassette in the system" on page 177.

### Place a PCI adapter in a single-width cassette

You might need to place a PCI adapter in a single-width cassette. Use the procedure in this section to perform this task.

To place a PCI adapter in a cassette, do the following:

1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 326 and "Handling static-sensitive devices" on page 327.
3. "Remove a PCI adapter contained in a cassette from the system" on page 164.
4. Remove any shipping handles or brackets attached to the adapter.
5. Remove the cassette cover by doing the following:
  - a. Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
  - b. Lift the cover **B** off of the pivot pin.
  - c. Slide the cover off of the cassette.



IPHA520-0

Figure 144. PCI adapter single-width cassette cover removed

6. Ensure the cassette is prepared to receive an adapter by doing the following:
  - a. Ensure the cassette is empty by doing one of the following:
    - “Remove an adapter from the PCI adapter single-width cassette” on page 192.
    - Remove the adapter filler panel from the cassette.
  - b. Ensure that all of the adapter retainers **A** have been pushed out to the edges of the cassette to allow the placement of the adapter. See Figure 145 on page 197.



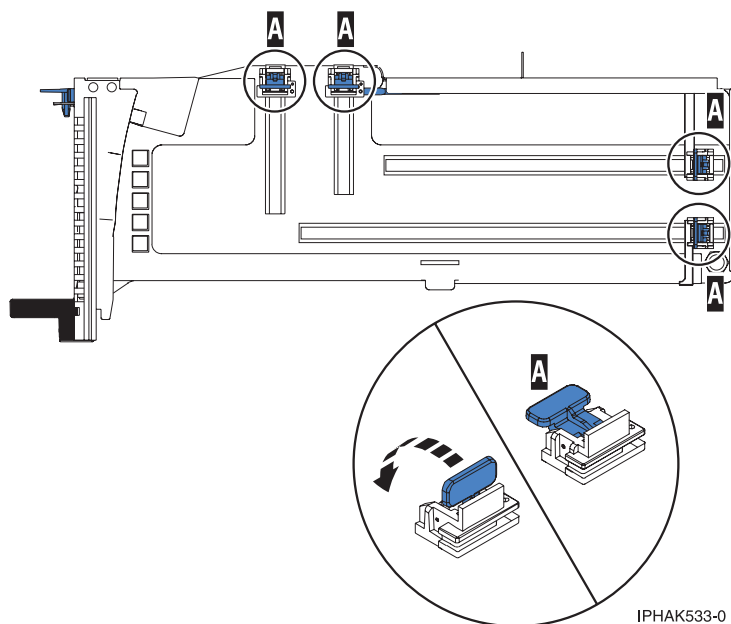


Figure 145. Adapter retainers

- c. Rotate the tailstock clamp into the open position.

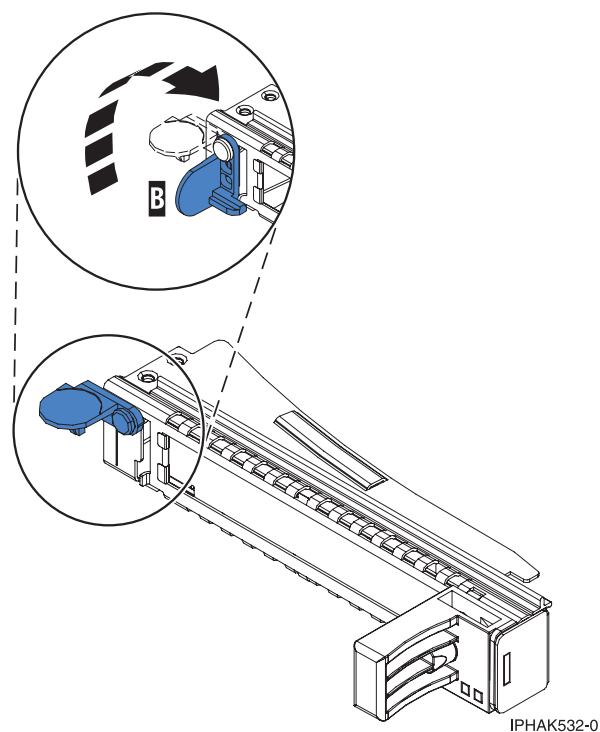
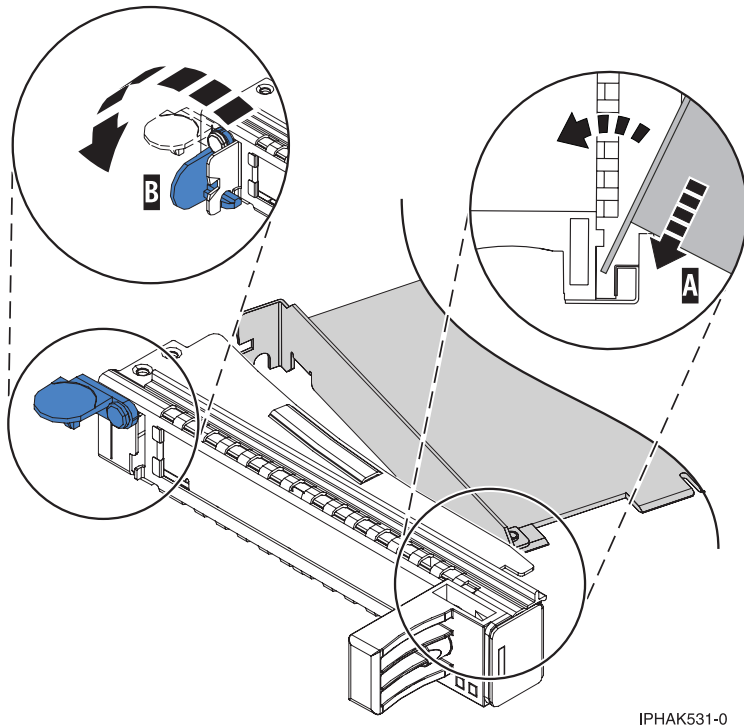


Figure 146. Tailstock clamp in the open position

7. Place the adapter in the cassette by doing the following:
  - a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 147 on page 198.
  - b. Rotate the adapter toward the top of the cassette and into place.

- c. Close the tailstock clamp **B**. See Figure 147.



IPHA531-0

Figure 147. Adapter removed from the PCI adapter single-width cassette

- d. Position the adapter retainers to support the adapter, and then rotate the retainer clip into the closed position.

**Note:**

- 1) 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.
- 2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.
- 3) 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**

- a) Place and lock the retainers **B**. See Figure 148 on page 199.

**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.

- 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.

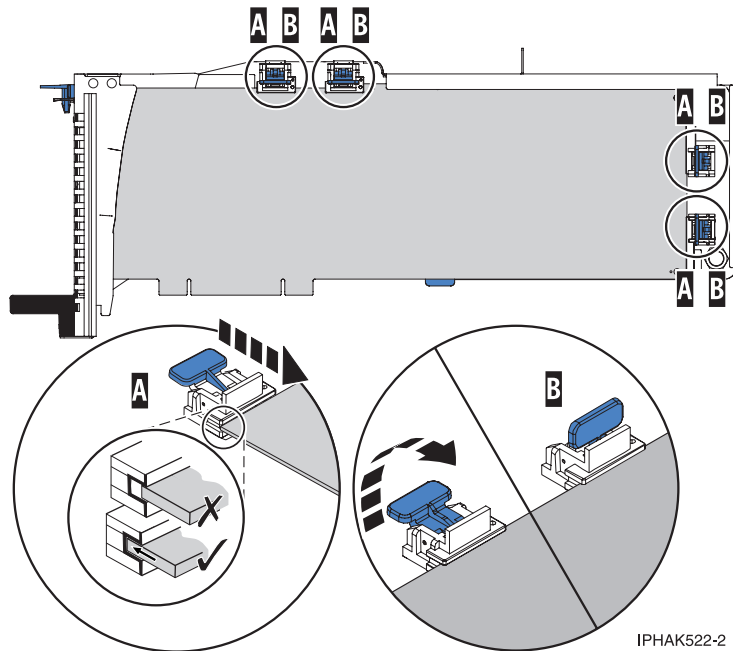


Figure 148. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

#### Adapter-cassette retainer placement for mid-sized adapters

- a) Remove the adapter stabilizer **C**. See Figure 149 on page 200.
- b) Place and lock the retainers **B**.
- c) 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.

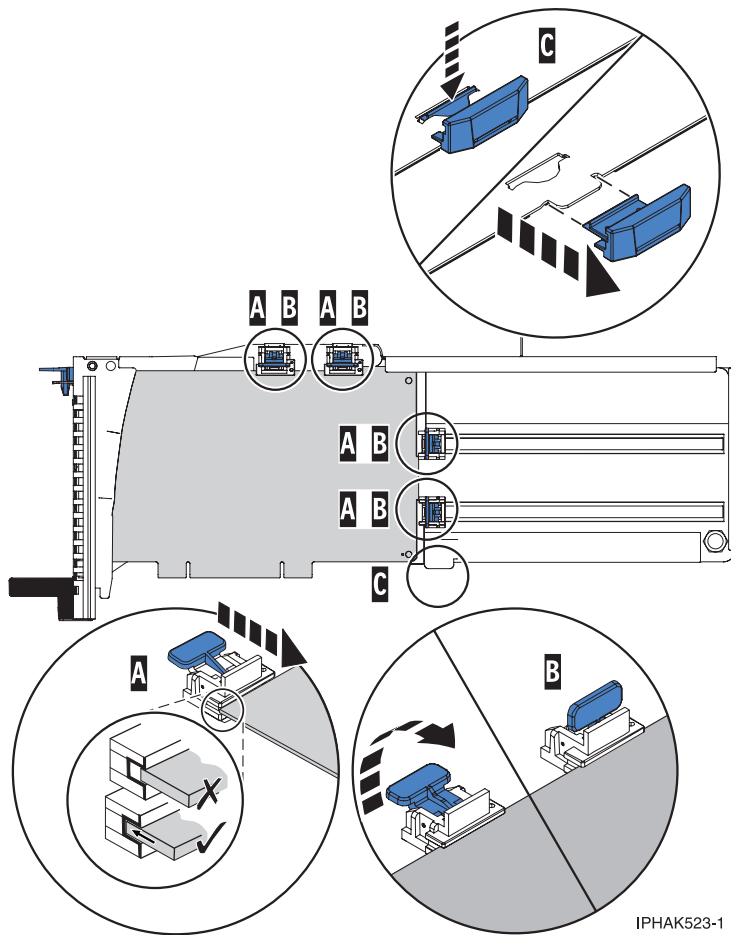


Figure 149. Medium-length adapter in the PCI adapter cassette with the supports in place

#### Adapter-cassette retainer placement for small adapters

- Remove the adapter stabilizer **C**. See Figure 150 on page 201.
- Place the hookarm **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.

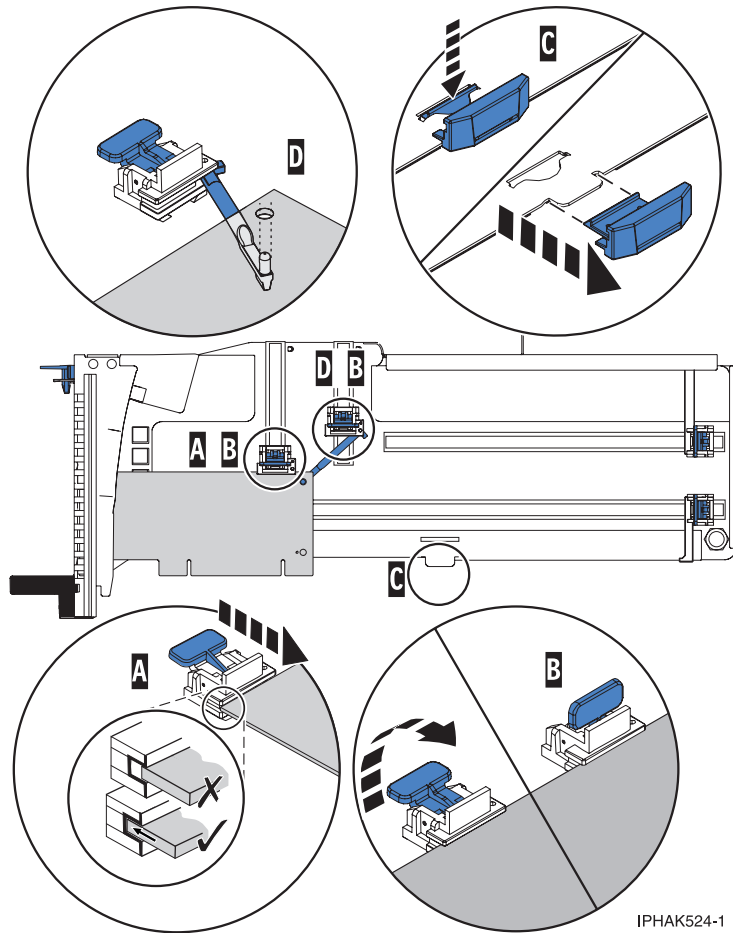
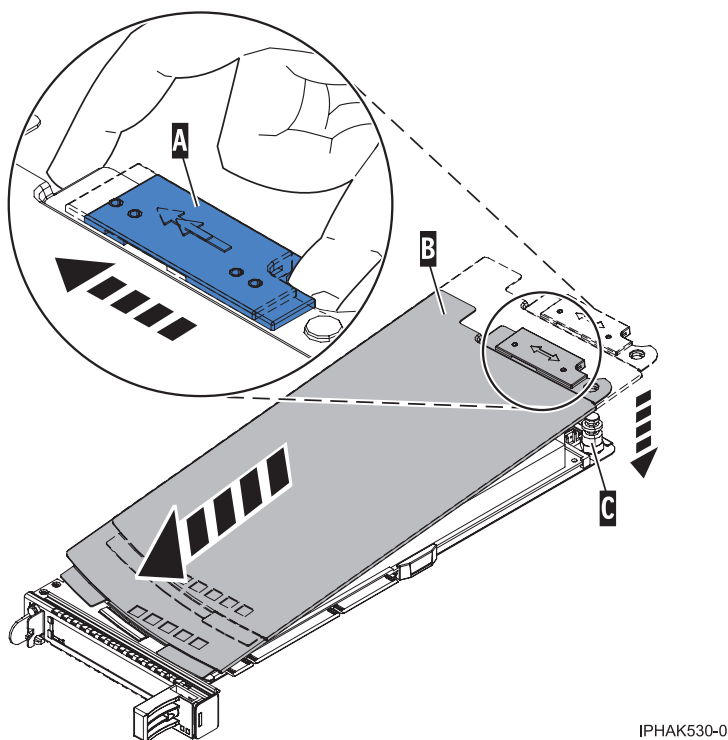


Figure 150. Short adapter in the PCI adapter cassette with the supports and the hookarm in place

8. Replace the cassette cover by doing the following:
  - a. Slide the cover **B** into position on the cassette as shown in the following figure.
  - b. While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
  - c. Release the cover latch to lock the cover into place.



IPHA530-0

Figure 151. PCI adapter cassette cover replaced

9. "Replace a PCI adapter contained in a cassette in the system" on page 177.

**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.

## PCI adapter double-wide cassette

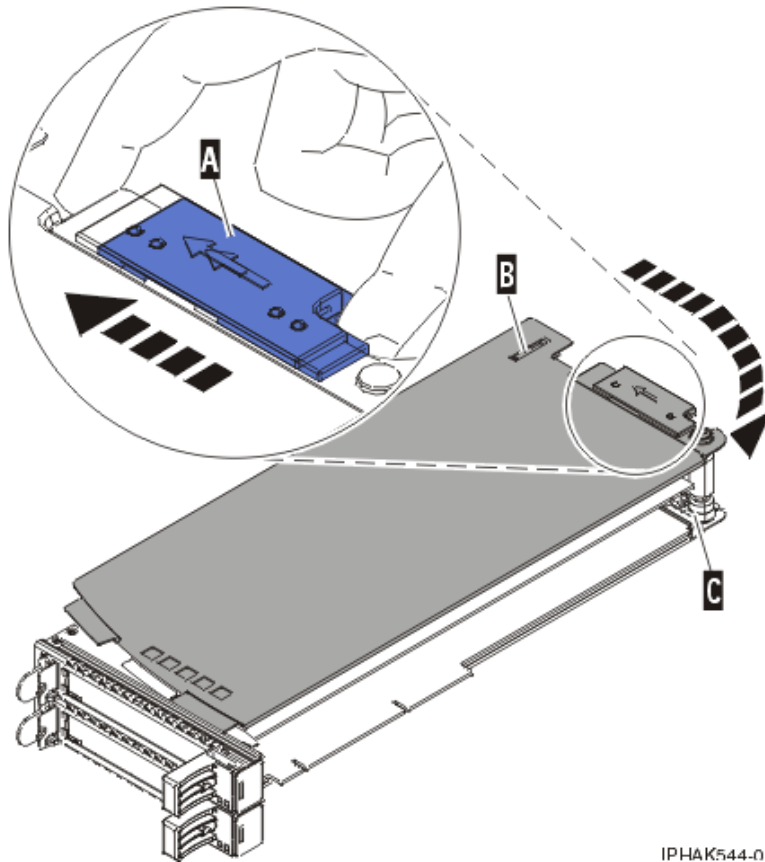
You might need to remove, replace, or install PCI adapters in a double-wide cassette. Use the procedures in this section to perform these tasks.

### Remove an adapter from the PCI adapter double-wide cassette

You might need to remove a PCI adapter from a double-wide cassette. Use the procedure in this section to perform this task.

To remove an adapter from the cassette, do the following:

1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 326 and "Handling static-sensitive devices" on page 327.
3. "Remove a PCI adapter contained in a cassette from the system" on page 164.
4. Remove any shipping handles or brackets attached to the adapter.
5. Remove the cassette cover by doing the following:
  - a. Slide the cover latch A to disengage it from the pivot pin C as shown in the following figure.
  - b. Lift the cover B off of the pivot pin.
  - c. Slide the cover off of the cassette.



IPHA0544-0

Figure 152. PCI adapter cassette cover removed

- d. Unscrew pivot pin C and put it in a safe place
6. Remove the adapter from the cassette by doing the following:
  - a. Unlock the adapter retainers by rotating the retainer clip A into the horizontal position. See Figure 153 on page 204.

**Note:**

- 1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
  - 2) 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.
  - 3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
  - 4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- b. Push the adapter retainers B away from the adapter.
  - c. Unlock the adapter tailstock clamp C.
  - d. 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.
  - e. Lift the adapter out of the tailstock retaining channel.

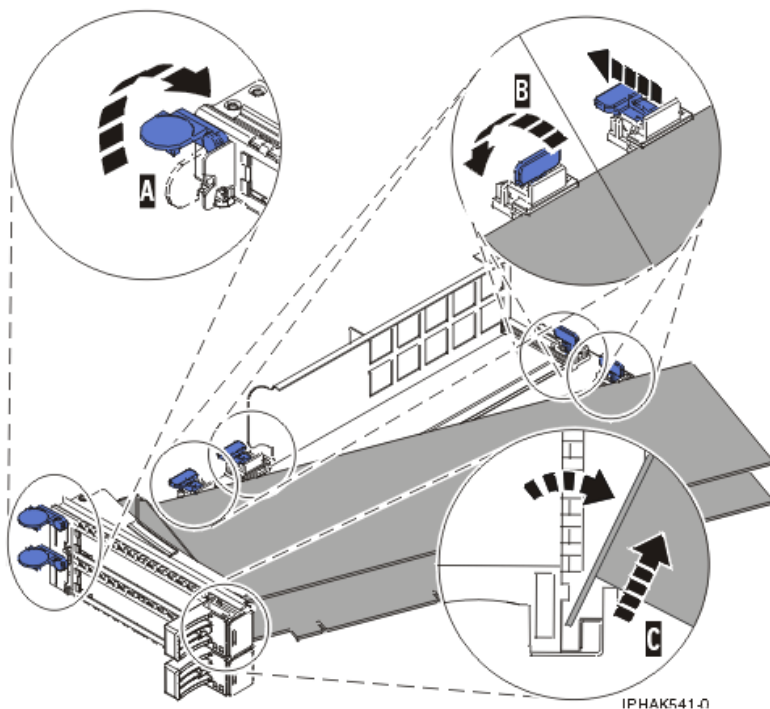


Figure 153. Adapter removed from the PCI adapter cassette

- f. Put the adapter in a safe place.

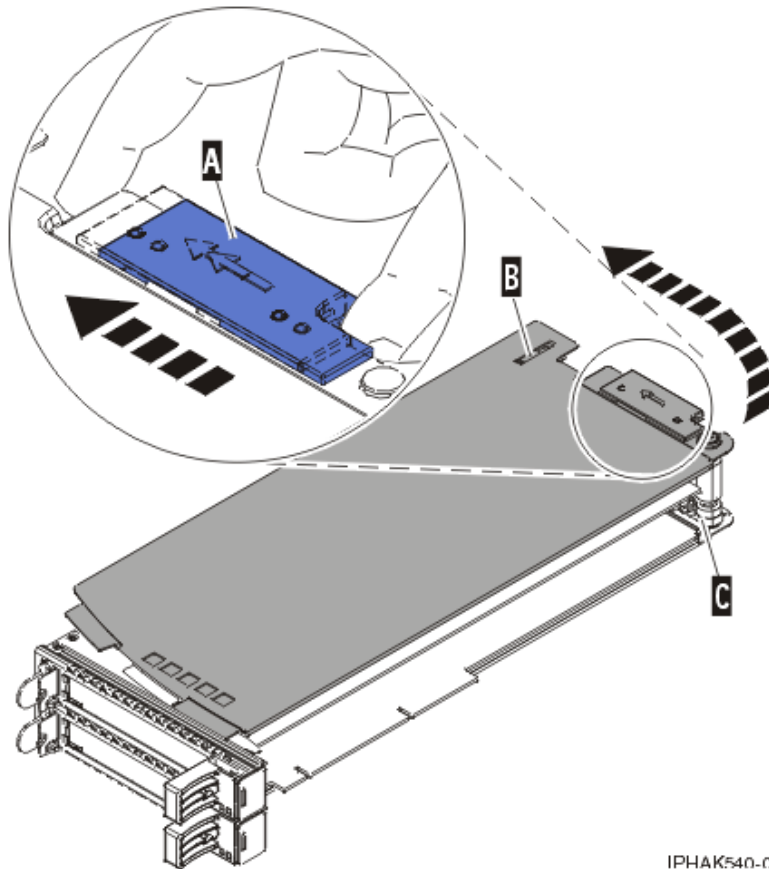
**Attention:** A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

- g. "Place an adapter in the PCI adapter double-wide cassette" on page 205.

**Note:** If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

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





IPHA6540-C

Figure 154. PCI adapter cassette cover replaced

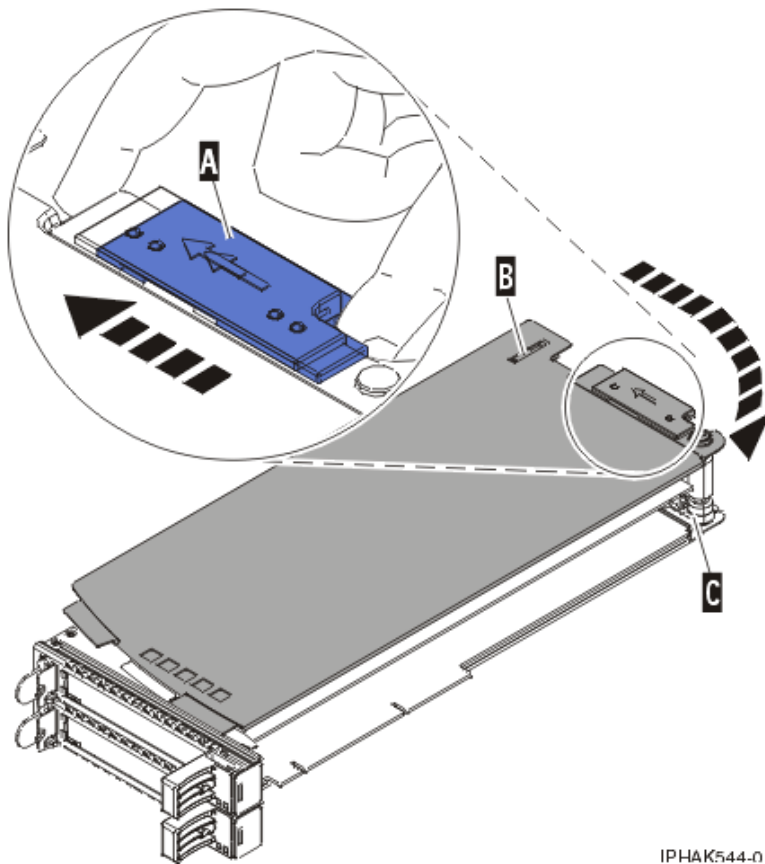
- i. "Replace a PCI adapter contained in a cassette in the system" on page 177.

### Place an adapter in the PCI adapter double-wide cassette

You might need to place a PCI adapter in a double-wide cassette. Use the procedure in this section to perform this task.

To place an adapter in a cassette, do the following:

1. Perform the prerequisite tasks described in "Before you begin" on page 336.
2. "Remove a PCI adapter contained in a cassette from the system" on page 164.
3. Remove the cassette cover by doing the following:
  - a. Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
  - b. Lift the cover **B** off of the pivot pin.
  - c. Slide the cover off of the cassette.



IPHAK544-0

Figure 155. PCI adapter cassette cover removed

- d. Unscrew pivot pin C and put it in a safe place
4. Ensure the cassette is prepared to receive an adapter by doing the following:
  - a. Ensure the cassette is empty by doing one of the following:
    - “Remove an adapter from the PCI adapter double-wide cassette” on page 202.
    - Remove the adapter filler panel from the cassette.
  - b. Ensure that all of the adapter retainers have been pushed out to the edges of the cassette to allow the placement of the adapter.
  - c. Place the tailstock clamp in the open position by pressing the cassette handle towards the retainer clip.
5. Place the adapter in the cassette by doing the following:
  - a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel A. See Figure 156 on page 207.
  - b. Rotate the adapter toward the top of the cassette and into place.
  - c. Close the tailstock clamp.

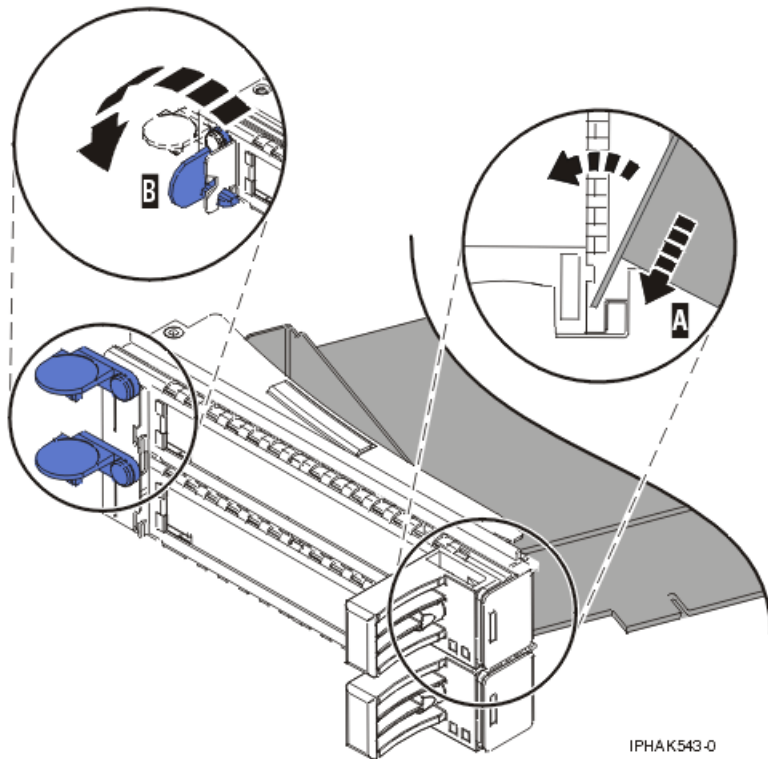


Figure 156. Adapter replaced in the PCI adapter cassette

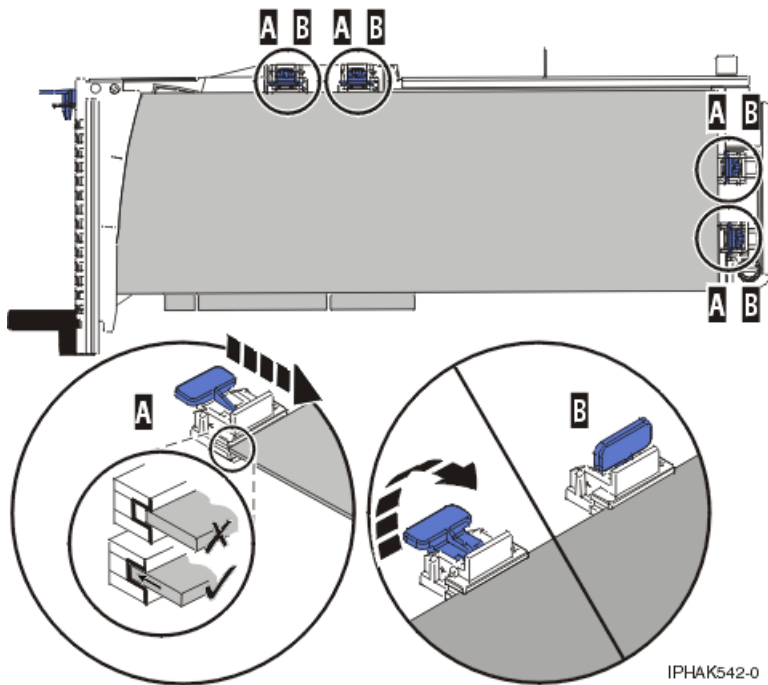
- d. Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 156.

**Note:**

- 1) 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.
- 2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.
- 3) Place and lock the retainers **B**. See Figure 157 on page 208.

**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.

- 4) 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.



IPHA542-0

Figure 157. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

6. After the retainers are placed, replace the cassette cover by doing the following:
  - a. Screw pivot pin **C** into place.
  - b. Slide the cover **B** into position on the cassette as shown in the following figure.
  - c. While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
  - d. Release the cover latch to lock the cover into place.

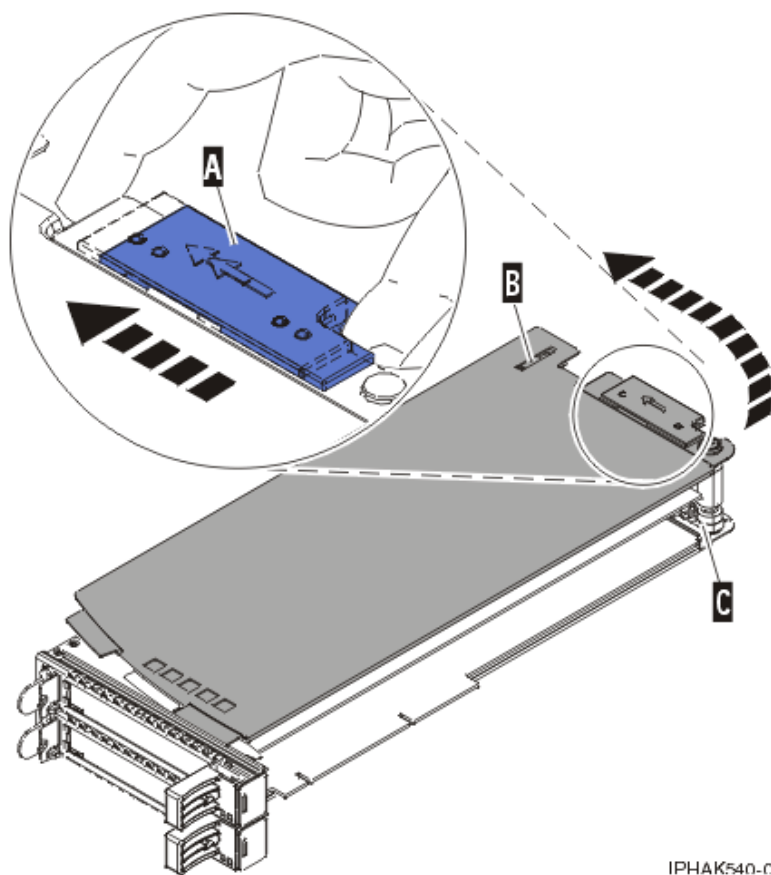


Figure 158. PCI adapter cassette cover replaced

7. "Replace a PCI adapter contained in a cassette in the system" on page 177.

**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.


## Other PCI adapter cassettes

For information about removing, replacing, and installing adapters and adapter cassettes in the model 595 system unit, see Installing Options in the *System p 690 Installation Guide*, SA38-0587-05.

## PCI adapter placement in the system unit or expansion unit

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

**Important:** If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing PTF prerequisites to install. To do this, use the

IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) 

### Important:

- If you are removing, installing or replacing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID controller, review the Concurrent maintenance procedure in the PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739, 5778, 5781, 5782; CCIN 571F, 575B) topic, before proceeding with the instructions provided here.

- If you are removing, installing or replacing a PCI-X DDR 1.5 GB cache SAS RAID Adapter, review the Concurrent maintenance procedure in the PCI-X DDR 1.5 GB cache SAS RAID Adapter topic, before proceeding with the instructions provided here.
- If you are exchanging a 2766, 2787, or 280E Fibre Channel IOA, the external storage subsystem must be updated to use the world-wide port name of the new 2766, 2787, or 280E IOA. For instructions, see “Updating the worldwide port name for a new 2766, 2787, or 280E IOA” on page 323.
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5703, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache may have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

## PCI adapter placement for IBM System p5 and eServer p5 system units and expansion units

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.


**Note:** In addition to these instructions, you can also use the System Planning Tool to determine adapter placement. Go to the Dynamic Logical Partitioning Web site at

<http://www-03.ibm.com/servers/eserver/support/tools/systemplanningtool/> .

### IBM System p5 and eServer p5 PCI and PCI-X adapters

Learn about PCI and PCI-X adapters that are supported by the AIX and Linux operating system.

**Note:**

1. Adapters supported in Linux have a Y in the Linux Support column.
2. To identify which release of AIX or Linux is required for an adapter, see the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) .
3. All adapters support Extended Error Handling (EEH).

*Table 1. PCI and PCI-X adapters that are supported by the AIX and Linux operating system.*

Feature/ CCIN	Description	Adapter characteristics	Linux support	Other information
1905/1905	4 Gb Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
1910/1910	4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1912/1912	PCI-X DDR Dual Channel Ultra320 LVD SCSI Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
1913/1913	PCI-X DDR Dual Channel Ultra320 LVD SCSI RAID Adapter	Long, 64-bit 3.3V	Y	• High bandwidth
1954/1954	4-Port 10/100/1000 Base-TX PCI-X Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
1957/1957	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth

Table 1. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

1958/1958	Gigabit Ethernet-SX Low Profile PCI-X Adapter (Fibre)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1959/1959	10/100/1000 Base-TX Ethernet Low Profile PCI-X Adapter (Copper)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1974/1974	PCI-X Dual Channel Ultra 320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
1975/1975	PCI-X Dual Channel Ultra 320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
1977/197E	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1978/1978	Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1979/1979	10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32-bit, 3.3 or 5V	Y	• High bandwidth
1980/1980	GXT135P Graphics Accelerator with Digital Support	Short, 32-bit, 3.3 or 5V	Y	
1981/1981	10 Gigabit Ethernet -SR PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1982/1982	10 Gigabit Ethernet-LR PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1983/1983	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1984/1984	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1985/1985	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	Y	
1986/573B	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	Y	• High bandwidth
1987/573C	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	Y	• High bandwidth
1990/1990	Low Profile Dual Port Gigabit ENET (UTP)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1999/1999	Low Profile Dual Port Gigabit ENET (Fiber)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
2498/4-X	PCI 4-Channel Ultra3 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3 or 5V	N	
2737/N-D	Keyboard/Mouse Attachment Adapter	Short, 32-bit, 3.3 or 5V	Y	
2738/2738	2 Port USB PCI Adapter	Short, 32-bit, 3.3 or 5V	Y	
2842/2842	POWER® GXT4500P Graphics Accelerator	Long, 32 or 64-bit, 3.3 or 5V	Y	
2843/2843	POWER GXT6500P Graphics Accelerator	Long, 64-bit, 3.3 or 5V	Y	

Table 1. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

2848/I-X	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32-bit, 3.3 or 5V	Y	• Not hot-pluggable
2849/2849	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32 or 64-bit, 3.3V	Y	• Not hot-pluggable
2943/3-B	8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	Short, 32-bit, 3.3 or 5V	N	
2944/3-C	128-Port Asynchronous Controller, PCI bus	Short, 32-bit, 3.3 or 5V	N	
2946/A-B	Turboways 622 Mbps PCI MMF ATM Adapter	Short, 64-bit, 3.3 or 5V	N	• High bandwidth
2947/9-R	ARTIC960Hx 4-Port Multiprotocol PCI Adapter	Long, 32-bit, 3.3 or 5V	N	
2962/9-L	2-Port Multiprotocol PCI Adapter	Short, 32-bit, 3.3 or 5V	N	
4764/4764	PCI-X Cryptographic Coprocessor	Short, 64-bit, 3.3V	N	
4953/A-C	64bit/66MHz PCI ATM 155 UTP Adapter	Short, 32 or 64-bit, 3.3 or 5V	N	
4957/A-D	64bit/66MHz PCI ATM 155 MMF Adapter	Short, 32 or 64-bit, 3.3 or 5V	N	
4959/9-Y	Token-Ring PCI Adapter	Short, 32-bit, 3.3 or 5V	Y	
4960/6-J	Cryptographic Accelerator	Short, 32-bit, 3.3 or 5V	N	
4961/A-E	Universal 4-Port 10/100 Ethernet Adapter	Long, 32 or 64-bit, 3.3 or 5V	Y	
4962/A-F	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	Y	
4963/6-I	PCI Cryptographic Coprocessor (FIPS-4)	Short, 32-bit, 3.3 or 5V	N	
5700/5700	Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5701/5701	10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5703/5703	PCI-X Dual Channel Ultra320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
5706/5706	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5707/5707	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5710/5702	PCI-X Dual Channel Ultra320 SCSI Blind Swap Adapter	64-bit, 3.3 volt	Y	• High bandwidth



Table 1. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

5711/5703	PCI-X Dual Channel Ultra320 SCSI RAID Blind Swap Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
5712/5712	PCI-X Dual Channel Ultra 320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
5713/5713	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5714/5714	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5716/280B	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5718/5718	10 Gigabit-SR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
5719/5719	10 Gigabit-LR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
5721/573A	10 Gb-SR Ethernet PCI-X 2.0 DDR Adapter	Short, 64 bit, 3.3 V	Y	• Extra-high bandwidth
5722/576A	10 Gb-LR Ethernet PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3 V	Y	• Extra-high bandwidth
5723/5723	2-Port EIA-232 Asynch PCI Adapter	Short, 32-bit, 3.3V or 5V	Y	• High bandwidth
5732/5732	Low Profile Dual Port Gigabit Enet (Fiber)	Short, 32 to 64-bit, 3.3V or 5V	Y	• High bandwidth
5736/ 5736	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter	Short, 32 to 64-bit, 3.3V	Y	• High bandwidth
5737/ 5737	PCI-X Dual Channel Ultra320 SCSI Raid- 2.0 DDR Adapter	Long, 64-bit, 3.3V	Y	• High bandwidth
5740/5740	4-Port 10/100/1000 Base-TX PCI-X Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
5758/5758	4 Gb Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
5759/5759	4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
5902/572B	PCI-X DDR Dual –x4 Port SAS RAID Adapter	Long, 64-bit, 3.3V	Y	• Extra-high bandwidth
5912/572A	PCI-X DDR External Dual – x4 Port SAS Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
6203/4-Y	PCI Dual Channel Ultra3 SCSI Adapter	Long, 32 to 64-bit, 3.3V or 5V	Y	
6204/4-U	PCI Universal Differential Ultra SCSI Adapter	Short, 32-bit, 3.3 or 5V	Y	
6228/4-W	2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus	Short, 32 to 64-bit, 3.3V or 5V	Y	• High bandwidth
6230/4-P	Advanced Serial RAID Plus Adapter	Long, 32 to 64-bit, 3.3V or 5V	N	• High bandwidth

Table 1. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

6239/5704	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 to 64-bit, 3.3V or 5V	Y	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
6310/6310	ARTIC960RxD Quad Digital Trunk PCI Adapter	Long, 32-bit, 3.3 or 5V	N	<ul style="list-style-type: none"> <li>Digital Trunk adapters have an internal cable and must be in contiguous slots.</li> </ul>
6312/6312	Quad Digital Trunk Telephony PCI Adapter	Long, 32 or 64-bit, 3.3 or 5V	N	<ul style="list-style-type: none"> <li>Digital Trunk adapters have an internal cable and must be in contiguous slots.</li> </ul>
8244/8244	Audio PCI Adapter for Workstations	Short, 32-bit, 3.3V	N	<ul style="list-style-type: none"> <li>Not hot-pluggable in model 52x</li> </ul>

## Logical partition (LPAR) considerations

Learn about LPAR considerations related to PCI adapter placement.

Place redundant devices in separate I/O units for the best performance. Place nonredundant devices in the same I/O unit. If you place nonredundant devices in one unit, the system is less exposed to other-unit failures.

Some devices do not have enhanced error handling (EEH) capabilities built in to their device drivers. If these devices fail, the PCI bridge set in which they are placed are affected. If the I/O subsystem encounters a severe error, all slots in the PCI bridge set are also affected. To clear this condition, you can reboot the system. In addition, it is also possible to remove the failed PCI slots on an affected PCI bridge set from the partition profile or profiles that include these PCI slots, and reboot the partition or partitions that terminated at the time of the error. To avoid PCI bridge set errors related to non-enhanced error handling adapters, if a non-enhanced error handling adapter is used, all slots on that PCI bridge set should be assigned to a single partition.

## Model 7047-185 (IntelliStation® POWER 185 ) and 7037-A50 (p5 185) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

### System unit back view

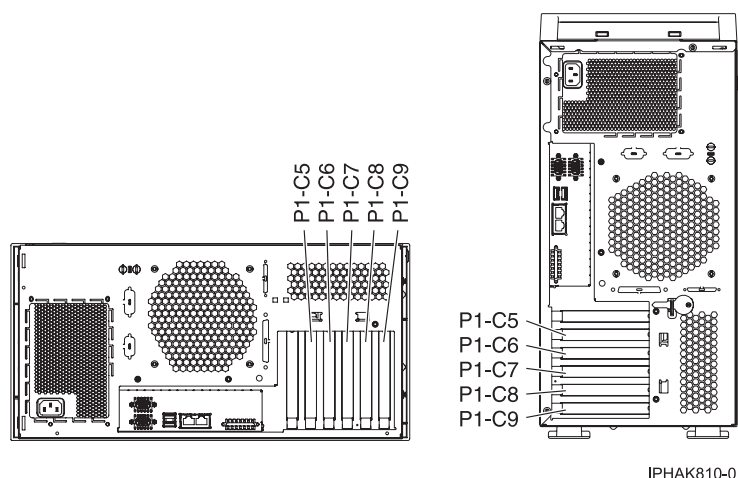


Figure 159. System unit back view with location codes for PCI slots.

## PCI slot descriptions

The model 7047-185 or 7037-A50 has 4 PCI-X slots, and 1 PCI slot, and supports a total of 5 PCI/PCI-X adapters. The following table describes the PCI/PCI-X slots:

PHB0			PHB1	PHB2		PHB3	PHB4	
Slot 1 (P1-C5)	Integrated IDE	Integrated USB (2)	Slot 2 (P1-C6)	Integrated Dual 1 Gb Ethernet	Integrated SCSI U320	Slot 3 (P1-C7)	Slot 4 (P1-C8)	Slot 5 (P1-C9)
Short			Long			Long	Long	Long
32-bit 3.3V, 33 MHz			64-bit 3.3V, 133 MHz			64-bit 3.3V, 133 MHz	64-bit 3.3V, 100 MHz	64-bit 3.3V, 100 or 133* MHz

\* Slot 5 is capable of 133 MHz only if slot 4 is empty. If slot 4 is occupied, slot 5 is capable of 100 MHz

## PCI Host Bridge (PHB) descriptions

**PHB0:** South bridge

**PHB1:** Upper HyperTransport Tunnel bridge A

**PHB2:** Upper HyperTransport Tunnel bridge B

**PHB3:** Lower HyperTransport Tunnel bridge B

**PHB4:** Lower HyperTransport Tunnel bridge A

## Recommended system unit slot placement and maximum number of adapters

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. For more information about the adapters that are listed, see "IBM System p5 and eServer p5 PCI and PCI-X adapters" on page 210.

Feature code	Base unit slot priority	Maximum number of adapters allowed	
		7037-A50	7047-185
2842 <sup>1</sup>	2, 3	NA	2
2843 <sup>1</sup>	2	NA	1
1954 *	2, 3	2	2

5740 *	2, 3	2	2
1984 *	2, 3, 5/4	3	3
5706 *	2, 3, 5/4	3	3
5707 *	2, 3, 5/4	3	3
1983 *	2, 3, 5/4	3	3
1978 *	2, 3, 5, 4	4	4
1979 *	2, 3, 5, 4	4	4
5700 *	2, 3, 5, 4	4	4
5701*	2, 3, 5, 4	4	4
5759**	2, 3, 5, 4	3	3
1910**	2, 3, 5, 4	3	3
1905*	2, 3, 5, 4	4	4
5758*	2, 3, 5, 4	4	4
1986 *	2, 3, 5, 4	3	3
1987*	2, 3, 5, 4	3	3
5713 *	2, 3, 5, 4	3	3
5714*	2, 3, 5, 4	3	3
1977 *	2, 3, 5, 4	3	1
5716 *	2, 3, 5, 4	3	1
1912*	2, 3, 5, 4, 1	4	4
5736*	2, 3, 5, 4, 1	4	4
1913*	2, 3, 5, 4	4	4
5737*	2, 3, 5, 4	4	4
1980	2, 3, 4, 5	2	4
2849	2, 3, 4, 5	2	4
2947	4, 5, 3, 2	3	3
5723	1, 4, 5, 3, 2	2	2
2943	1, 4, 5, 3, 2	2	2
** Extra-high bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.			
* High bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.			
<sup>1</sup> This feature is only for the 7047-185			

## Performance notes (for optimum performance)

System unit information:

- No more than three EHB adapters can be placed in the system. If an EHB adapter is placed in the system, it must be the only EHB or HB adapter attached to the PHB it uses.
- No more than four HB adapters can be placed in the system
- No more than three Gb Ethernet ports per PHB.
- No more than three 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an adapter lists slot 5/4, this indicates the adapter can go in slot 5 or 4, but not both 5 and 4.

## Model 9111-285 (IntelliStation POWER 285) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

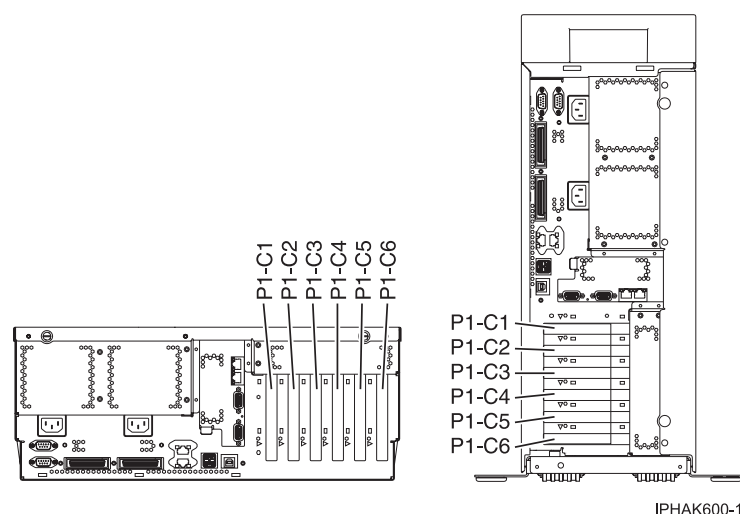


Figure 160. Rack mounted and desktide system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 2. Slot location description

PHB0			PHB2	PHB3			
Slot 1	Slot 2	Integrated Dual 1 Gb Ethernet	Slot 4	Slot 3	Slot 5	Slot 6	Integrated SCSI U320
Short	Short		Graphics adapter	Short	Long (see note)	Long	
64-bit 3.3V, 133 MHz	32-bit 3.3V, 66 MHz	133 MHz	64-bit 3.3V, 266 MHz	32-bit 3.3V, 66 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C1	Un-P1-C2		Un-P1-C4	Un-P1-C3	Un-P1-C5	Un-P1-C6	

- Slot C4 is dedicated to a graphics adapter.
- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slot C5 can only accommodate short cards if feature 6594 is present in the system unit.
- Short adapters can go in short or long slots.
- For best performance 64-bit adapters should go in 64-bit slots.
- All slots support Enhanced Error Handling (EEH)

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature Code	Base Unit slot priority	Maximum number of adapters allowed
		Base Unit
2843	4	1
2842	4, 5	2
2849	2, 3, 6, 1, 5	4
5721**	5, 1, 6	2
5722**	5, 1, 6	2
1982**	5, 1, 6	1
5719**	5, 1, 6	1
1981**	5, 1, 6	1
5718**	5, 1, 6	1
1954*	5, 1, 6	3
5740*	5, 1, 6	3
1984*	5, 1, 6, 3, 2	5
5707*	5, 1, 6, 3, 2	5
1983*	5, 1, 6, 3, 2	5
5706*	5, 1, 6, 3, 2	5
1978*	5, 1, 6, 3, 2	5
5700*	5, 1, 6, 3, 2	5
1979*	5, 1, 6, 3, 2	5
5701*	5, 1, 6, 3, 2	5
1910**	5, 1, 6	2
5759**	5, 1, 6	2
1905*	5, 1, 6, 3, 2	5
5758*	5, 1, 6, 3, 2	5
1987*	5, 1, 6,	3
5714*	5, 1, 6,	3
1986*	5, 1, 6	3
5713*	5, 1, 6	3
1977*	5, 1, 6, 3, 2	5
5716*	5, 1, 6, 3, 2	5
6239*	5, 1, 6, 3, 2	5
1913*	6, 5	2
5737*	6, 5	2
1974*	5, 1, 6, 3, 2	5
5712*	5, 1, 6, 3, 2	5
5736*	5, 1, 6, 3, 2	5
1912*	5, 1, 6, 3, 2	5

1975*	6, 5	2
5703*	6, 5	2
6204	2, 3, 6, 1, 5	3
1985	2, 3, 6, 1, 5	3
4962	2, 3, 6, 1, 5	3
2738	2, 3, 6, 1, 5	3
1980	2, 3, 6, 1, 5	4
2943	2, 3, 6, 1, 5	2
2944	2, 3, 6, 1, 5	2
2947	6, 5	2
2962	2, 3, 6, 1, 5	4
5723	2, 3, 6, 1, 5	2
4959	2, 3, 6, 1, 5	4
8244	2, 3, 6, 1, 5	1
<p>** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.</p>		

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total includes the two integrated Gb Ethernet ports on PHB 2.
- No more than three high bandwidth adapters per PHB; four per base system; eight per entire system with one or more expansion units
- No more than one 10 Gb Ethernet port per 2 CPUs in a system. If one 10 Gb Ethernet port is present per 2 CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than three 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9115-505 (p5 505) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

## System unit back view

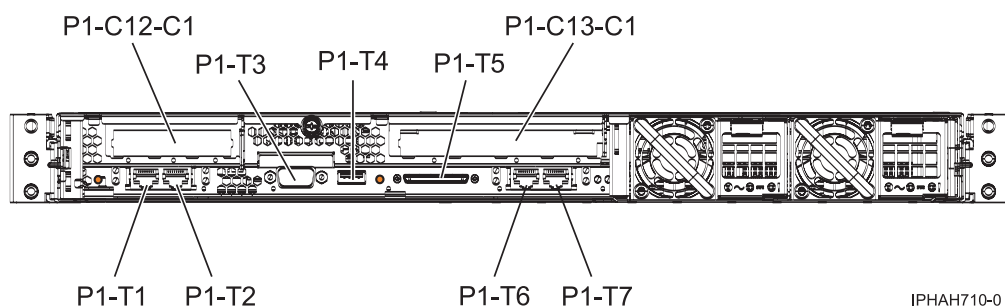


Figure 161. Back view of the system unit and its connectors

## PCI slot description

- The following table shows the slot properties and PHB connections.

Table 3. Slot location description

PHB 0	PHB 3
Slot 1	Slot 2
Short, low profile	Long
64-bit 3.3V, 266 MHz	64-bit 3.3V, 266 MHz
Un-P1-C12-C1	Un-P1-C13-C1

- Short adapters can go in short or long slots.
- For best performance 64-bit adapters should go in 64-bit slots.
- All slots support Enhanced Error Handling (EEH)
- None of the slots in this system are hot-pluggable.

## Recommended system unit slot placement

See the following table to identify the recommended system unit slot placement of specified adapters. Slot 1 can only hold a short, low profile adapter. Slot 2 can only hold a short or long standard-profile adapter.

Feature Code	Slot 1	Slot 2
5721**		X
5722**		X
1982**		X
1981**		X
5718**		X
5719**		X
1954*		X
5740*		X
1984*		X
5707*		X
1983*		X
5706*		X



1990*	X	
5706*		X
5707*		X
1978*		X
5700*		X
1979*		X
1959*	X	
1910**		X
5759**		X
1905**		X
5758**		X
5701*		X
5758*		X
1987*		X
5714*		X
1986*		X
5713*		X
1977*		X
1957*	X	
5716*		X
1913*		X
5737*		X
1912*		X
1974*		X
5736*		X
1975*		X
5703*		X
5712*		X
4764		X
5723		X
1985		X
2738		X
2943		X
2947		X
2849		X
4962		X
1980		X

\*\* Extra-high Bandwidth (EHB) adapter. See the *Performance notes* before installing this adapter.

\* High Bandwidth (HB) adapter. See the *Performance notes* before installing this adapter.

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

## Performance notes (for optimum performance)

### System unit information:

- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

## Model 9110-510 (p5 510) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

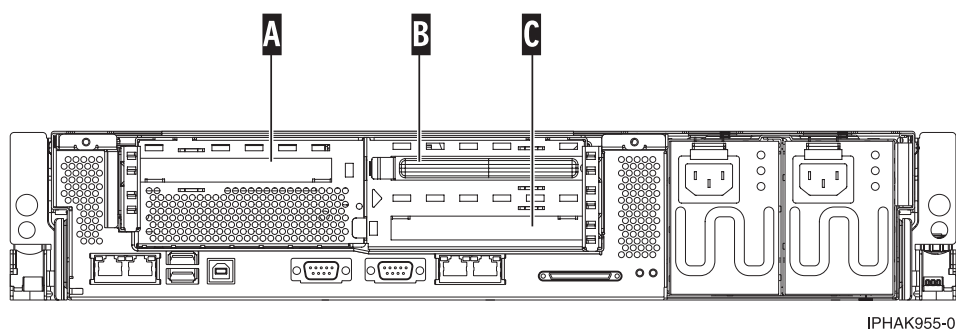


Figure 162. Rack mounted system unit back view with three PCI slots available.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 4. Slot location description

PHB2		
Slot 1 (A)	Slot 2 (B)	Slot 3 (C)
Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P2-C1	Un-P2-C2	Un-P2-C3

- Slots C1 through C3 are compatible with PCI and PCI-X adapters.
- All slots are long slots
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- None of the slots in this system are hot-pluggable.

## Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, there is no maximum limit for that adapter.

Feature Code	Base Unit slot priority	Maximum number of adapters allowed
5721 **	1, 2, 3	1
5722 **	1, 2, 3	1
5719**	1, 2, 3	1
5718**	1, 2, 3	1
1954 *	1, 2, 3	2
5740 *	1, 2, 3	2
5707*	1, 2, 3	3
5706*	1, 2, 3	3
5701*	1, 2, 3	3
5700*	1, 2, 3	3
5758*	1, 2, 3	2
5759**	1, 2, 3	2
5713*	1, 2, 3	2
1986*	1, 2, 3	2
5714*	1, 2, 3	2
1987*	1, 2, 3	2
5716*	1, 2, 3	3
5736*	1, 2, 3	3
1912*	1, 2, 3	3
5737*	1, 2, 3	3
5712*	1, 2, 3	3
5703*	1, 2, 3	3
4764	1, 2, 3	3
2738	1, 2, 3	1
2849	1, 2, 3	1
4962	1, 2, 3	3
5723	1, 2, 3	3
2943	1, 2, 3	3
2944	1, 2, 3	3
2962	1, 2, 3	3
2947	1, 2, 3	3
** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.		
* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.		

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

## Performance notes (for optimum performance)

System unit information:

- A maximum of one 10 Gb Ethernet port allowed on a 2 way system.
- No more than three Gb Ethernet ports per PHB or system.
- No more than three high-bandwidth adapters per PHB or system.
- If one 10 Gb port is present, no other 10 Gb or 1 Gb ports are allowed for optimum performance.
- No more than three Gb Ethernet ports per one CPU in a system.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

## Model 9110-51A (p5 510) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

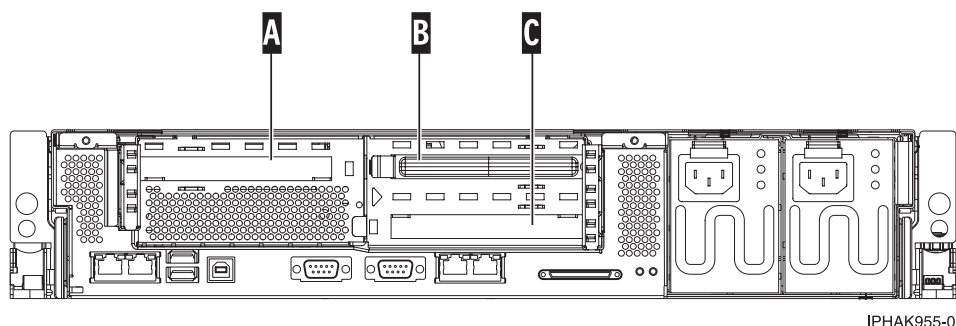


Figure 163. Rack mounted system unit back view with three PCI slots available.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 5. Slot location description

PHB0	PHB2		PHB3
Slot 1 (A)	Slot 2 (B)	Integrated Dual 1 Gb Ethernet	Slot 3 (C)
Long	Long		Long
64-bit 3.3V, 266 MHz	64-bit 3.3V, 133 MHz	133 MHz	64-bit 3.3V, 266 MHz
P1-C13-C1	P1-C14-C1		P1-C14-C2

- Slots C1 through C3 are compatible with PCI and PCI-X adapters.

- All slots are long slots
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- None of the slots in this system are hot-pluggable.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, there is no maximum limit for that adapter.

Feature Code	Base Unit slot priority	Maximum number of adapters allowed
5721**	1, 3, 2	1
5722**	1, 3, 2	1
1981 **	1, 3, 2	1
5718**	1, 3, 2	1
1982**	1, 3, 2	1
5719**	1, 3, 2	1
1954 *	1, 3, 2	3
5740 *	1, 3, 2	3
1983*	2, 1, 3	3
1984*	2, 1, 3	3
5706*	2, 1, 3	3
5707*	2, 1, 3	3
1979*	2, 1, 3	3
1978*	2, 1, 3	3
5701 *	2, 1, 3	3
5700*	2, 1, 3	3
1910 **	1, 3, 2	3
5759 **	1, 3, 2	3
1905*	1, 3, 2	3
5758*	1, 3, 2	3
1987*	2, 1, 3	3
1986*	2, 1, 3	3
5714*	2, 1, 3	3
5713*	2, 1, 3	3
1977*	2, 1, 3	3
5716*	2, 1, 3	3
1912*	2, 1, 3	3
1913*	2, 1, 3	1
5736*	2, 1, 3	3
5737*	2, 1, 3	2
1974*	2, 1, 3	3

5712*	2, 1, 3	3
5703*	2, 1, 3	3
4764	2, 1, 3	3
2738	2, 1, 3	2
5723	2, 1, 3	2
2943	2, 1, 3	2
2944	2, 1, 3	2
1985	2, 1, 3	3
4962	2, 1, 3	3
2947	2, 1, 3	2
1980	2, 1, 3	2
2849	2, 1, 3	2
2962	2, 1, 3	2
** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.		
* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.		

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- A maximum of one 10 Gb Ethernet port allowed on a 2 way system.
- No more than three Gb Ethernet ports per PHB or system.
- No more than three high-bandwidth adapters per PHB or system.
- If one 10 Gb port is present, no other 10 Gb or 1 Gb ports are allowed for optimum performance.
- No more than three Gb Ethernet ports per one CPU in a system.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9111-520 (p5 520) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

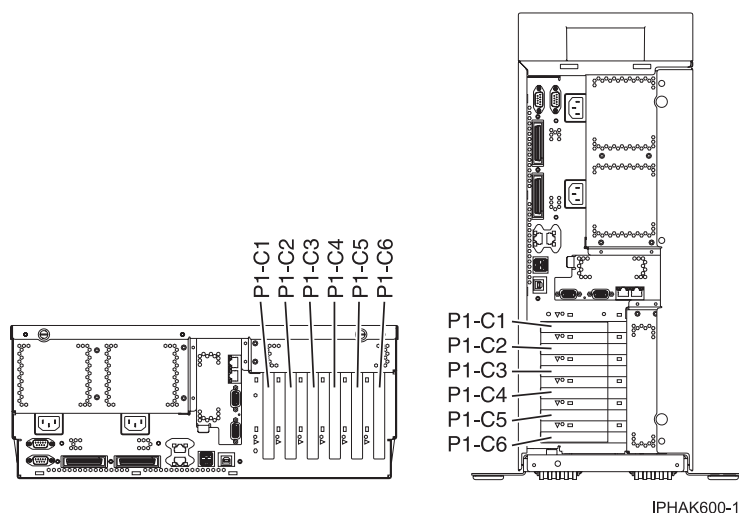


Figure 164. Rack mounted and desktide system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 6. Slot location description

PHB0				PHB2			
Slot 3	Slot 5	Slot 6	Integrated SCSI U320	Slot 1	Slot 2	Slot 4	Integrated Dual 1 Gb Ethernet
Short	Long	Long		Short	Short	Long	
32-bit 3.3V, 66 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz	64-bit 3.3V, 133 MHz	32-bit 3.3V, 66 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C3	Un-P1-C5	Un-P1-C6		Un-P1-C1	Un-P1-C2	Un-P1-C4	

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slot C5 can only accommodate short cards if feature 6594 is present in the system unit.
- Short adapters can go in short or long slots.
- For best performance 64-bit adapters should go in 64-bit slots.
- All slots support Enhanced Error Handling (EEH)
- The system supports up to a total of 4 expansion units; models D11 and D20.
- The model D20 expansion unit, with most its features, can migrate from other System p systems.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature Code	Base Unit slot priority	Maximum number of adapters allowed		
		Base Unit	Expansion Unit	System
6312 <sup>1</sup>	4, 5, 6	3		18
5721 <sup>**</sup>	1, 6, 4, 5	3	4	4
5722 <sup>**</sup>	1, 6, 4, 5	3	4	4
5719 <sup>**</sup>	5, 6	1	1	1

5718**	5, 6	1	1	1
5740*	1, 6, 4, 5	4		4
5707*	5, 6, 1, 4, 3, 2	6		
5706*	5, 6, 1, 4, 3, 2	6		
5701*	5, 6, 1, 4, 3, 2	6		
5700*	5, 6, 1, 4, 3, 2	6		
5758*	5, 1, 6, 4	4		20
5759**	5, 1, 6, 4	4		20
5713*	1, 5, 4, 6	4		20
5714*	1, 5, 4, 6	4		20
5716*	5, 6, 1, 4, 3, 2	4		
6239*		0		
6228*		0		
5902**	5, 6, 4	3		12
5912**	5, 6, 1, 4	4		6
5737*	5, 6, 4	3		
5736*	5, 6, 1, 4, 3, 2	6		
5712*	5, 6, 1, 4, 3, 2	6		
5703*	5, 6, 4	3		
2946*		0		6
6230*	5, 6, 4	0		16
6231	128 MB DRAM Option Card for feature 6230			
6235	32 MB Fast-Write Cache Option Card for feature 6230			
4764	2, 3, 4, 1, 6, 5			8
2498		0		16
2737		0	4	4
2738	2, 3, 4, 1, 6, 5	2	6	6
2848		0	4	4
2849	2, 3, 4, 1, 6, 5	4	6	6
2943	2, 3, 4, 1, 6, 5	6		10
2944	2, 3, 4, 1, 6, 5	6		10
6310	4, 5, 6	2		
2947	4, 5, 6	3	4	4
2962	2, 3, 4, 1, 6, 5	6		10
4953		0		20
4957		0		20
4959	2, 3, 4, 1, 6, 5	4		20
4960		0		16
4961		0		20
4962	2, 3, 4, 1, 6, 5	6		



4963		0		8
5709	Attaches to CEC IO - no slot used	1		
5723	2, 3, 4, 1, 6, 5	2		10
6203		0		16
6204	2, 3, 4, 1, 6, 5	6		10
8244	2, 3, 4, 1, 6, 5	1	1	1
<p>** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p><sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.</p>				

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total includes the two integrated Gb Ethernet ports on PHB 2.
- No more than three high bandwidth adapters per PHB; four per base system; eight per entire system with one or more expansion units
- No more than one 10 Gb Ethernet port per 2 CPUs in a system. If one 10 Gb Ethernet port is present per 2 CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than three 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9131-52A (p5 520) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

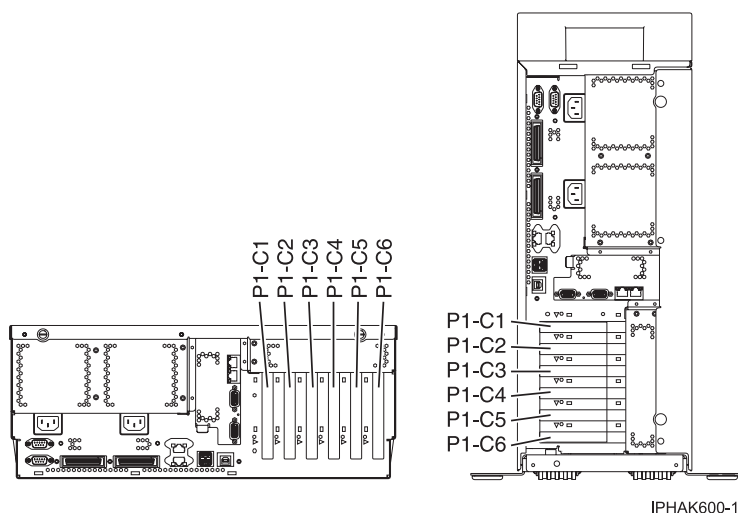


Figure 165. Model 9131-52A rack mounted and desktside system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 7. Model 9131-52A Slot location description

PHB0			PHB2	PHB3			
Slot 1	Slot 2	Integrated Dual 1 Gb Ethernet	Slot 4	Slot 3	Slot 5	Slot 6	Integrated SCSI U320
Short	Short		Long	Short	Long (see note)	Long	
64-bit 3.3V, 133 MHz	32-bit 3.3V, 66 MHz	133 MHz	64-bit 3.3V, 266 MHz	32-bit 3.3V, 66 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C1	Un-P1-C2		Un-P1-C4	Un-P1-C3	Un-P1-C5	Un-P1-C6	

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slot C5 can only accommodate short cards if feature 6594 is present in the system unit.
- Short adapters can go in short or long slots.
- For best performance 64-bit adapters should go in 64-bit slots.
- All slots support Enhanced Error Handling (EEH)
- The system supports up to a total of 4 expansion units; models D11 and D20.
- The model D20 expansion unit, with most its features, can migrate from other System p systems.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature code	Base unit slot priority	Maximum number of adapters allowed		
		Base unit	Per expansion unit	System
6312	6, 5, 4	3		
5721**	4, 5, 1, 6	3	4	9
5722**	4, 5, 1, 6	3	4	9

1982**	4, 5, 1, 6	2	2	10
5719**	4, 5, 1, 6	2	2	10
1981**	4, 5, 1, 6	2	2	10
5718**	4, 5, 1, 6	2	2	10
1954*	4, 1, 5, 6	4		
5740*	4, 1, 5, 6	4		
1984*	5, 1, 6, 4, 3, 2	6	7	34
5707*	5, 1, 6, 4, 3, 2	6	7	34
1983*	5, 1, 6, 4, 3, 2	6	7	34
5706*	5, 1, 6, 4, 3, 2	6	7	34
1979*	5, 1, 6, 4, 3, 2	6	7	34
5701*	5, 1, 6, 4, 3, 2	6	7	34
1978*	5, 1, 6, 4, 3, 2	6	7	34
5700*	5, 1, 6, 4, 3, 2	6	7	34
1910**	4, 5, 1, 6	4	4	20
5759**	4, 5, 1, 6	4	4	20
1905*	4, 1, 5, 6, 2, 3	5	4	22
5758*	4, 1, 5, 6, 2, 3	5	4	22
1986*	5, 1, 6, 4, 3, 2	5	4	21
1987*	5, 1, 6, 4, 3, 2	5	4	21
5713*	5, 1, 6, 4, 3, 2	5	4	21
5714*	5, 1, 6, 4, 3, 2	5	4	21
1977*	5, 1, 6, 4, 3, 2	6	7	32
5716*	5, 1, 6, 4, 3, 2	6	7	34
6239*	5, 1, 6, 4, 3, 2	6	7	34
5902**	4, 5, 6	3		6
5912**	4, 5, 1, 6	4		6
1913*	4, 5, 6	3	7	31
5737*	4, 5, 6	3	7	31
1912*	4, 5, 1, 6, 3, 2	6	7	34
5736*	4, 5, 1, 6, 3, 2	6	7	34
1974*	5, 1, 6, 4, 3, 2	6		
5712*	5, 1, 6, 4, 3, 2	6		
1975*	6, 5, 4	3		
5703*	6, 5, 4	3		
6230*	6, 5, 4	3		
4764	2, 3, 6, 1, 5, 4	6		8
6204	2, 3, 6, 1, 5, 4	2		
1985	2, 3, 6, 1, 5, 4	6		
4962	2, 3, 6, 1, 5, 4	6		
1980	2, 3, 6, 1, 5, 4	2		
2849	2, 3, 6, 1, 5, 4	2		

6310	6, 5, 4	3		
2947	6, 5, 4	3		
5723	2, 3, 6, 1, 5, 4	2	2	10
4959	2, 3, 6, 1, 5, 4	2		
2943	2, 3, 6, 1, 5, 4	2		
2944	2, 3, 6, 1, 5, 4	2		
2738	2, 3, 6, 1, 5, 4	3		
2962	2, 3, 6, 1, 5, 4	4		
8244	2, 3, 6, 1, 5, 4	1		
<p>** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p><sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.</p>				

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total includes the two integrated Gb Ethernet ports on PHB 2.
- No more than three high bandwidth adapters per PHB; four per base system; eight per entire system with one or more expansion units
- No more than one 10 Gb Ethernet port per 2 CPUs in a system. If one 10 Gb Ethernet port is present per 2 CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than three 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9113-550 (p5 550) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

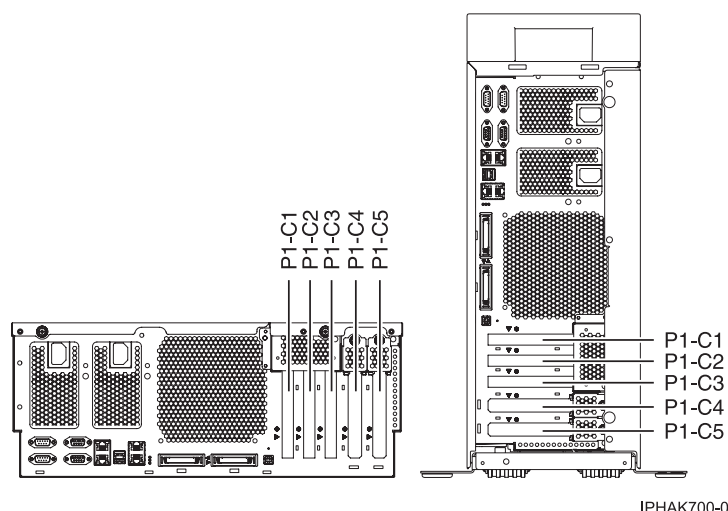


Figure 166. Model 9113-550 rack mounted and desktside system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 8. Model 9113-550 System p slot location descriptions

PHB0				PHB2		
Slot 1	Slot 2	Integrated Dual 1 Gb Ethernet	Integrated SCSI U320	Slot 3	Slot 4	Slot 5
Long	Long			Long	Long	Short
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz	133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	Short, 64-bit 3.3V, 133 MHz or GX+ adapter placement
Un-P1-C1	Un-P1-C2			Un-P1-C3	Un-P1-C4	Un-P1-C5

- Slots C1 through C5 are compatible with PCI and PCI-X adapters.
- Slots C5 can contain one PCI, PCI-X, or GX+ adapter. If a GX+ adapter is installed, it must be placed in the C5 slot.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- The system supports up to a total of 8 expansion units; model D20.
- The model D20 expansion unit, with most its features, can migrate from other System p systems.

### Recommended system unit slot placement and maximums for the model 9113-550

See the following table to identify the recommended system unit slot placement and the recommended maximum number of specified adapters.

**Note:** If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature Code	Base unit slot priority	Maximum number of adapters allowed		
		Base Unit	Expansion Unit	System
6312 <sup>1</sup>	1, 2, 3, 4	4		36
5721 <sup>**</sup>	1, 3, 2, 4, 5	4	4	12
5722 <sup>**</sup>	1, 3, 2, 4, 5	4	4	12

5719**	3, 1, 4, 2, 5	2	2	2
5718**	3, 1, 4, 2, 5	2	2	2
5740*	3, 1, 4, 2, 5	4		4
5707*	3, 4, 1, 5, 2	5		5
5706*	3, 4, 1, 5, 2	5		
5701*	3, 4, 1, 5, 2	5		
5700*	3, 4, 1, 5, 2	5		
5759**	1, 3, 2, 4, 5	4	4	
5758*	1, 3, 2, 4, 5	4	4	
5713*	3, 1, 4, 2, 5	4	4	36
5714*	3, 1, 4, 2, 5	4	4	36
5716*	3, 4, 1, 5, 2	5		
6228*		0		
6239*		0		
5902**	3, 4, 1, 2	4		24
5912**	3, 4, 1, 5, 2	5		12
5737*	3, 4, 1, 2	4		
5736*	3, 4, 1, 5, 2	4		
5712*	3, 4, 1, 5, 2	5		
5703*	3, 4, 1, 2	4		
2946*		0		6
6230*	3, 4, 1, 2	0		32
4764	2, 5, 1, 4, 3	5		8
2498		0		11
2737		0		8
2738	2, 5, 1, 4, 3	2		8
2848		0		8
2849	2, 5, 1, 4, 3	2		8
2943	2, 5, 1, 4, 3	2		18
2944	2, 5, 1, 4, 3	2		18
6310	2, 1, 4, 3	4		8
2947	2, 1, 4, 3	4		8
2962	2, 5, 1, 4, 3	4		20
4953		0		20
4957		0		20
4959	2, 5, 1, 4, 3	4		20
4960		0		32
4961		0		20
4962	2, 5, 1, 4, 3	5		
4963		0		16
5723	2, 5, 1, 4, 3	2		18
6203		0		32

6204	5, 2, 4, 1, 3	2		18
<p>** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p><sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.</p>				

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total should include the two integrated Gb Ethernet ports on PHB 0.
- No more than three high bandwidth adapters per PHB; eight per entire system with one RIO-G loop; 16 per entire system with two RIO-G loops.
- No more than one Extra-high bandwidth adapter per PHB; two per base system; four per entire system with one RIO-G loop; eight per entire system with two RIO-G loops
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9133-55A (p5 550) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

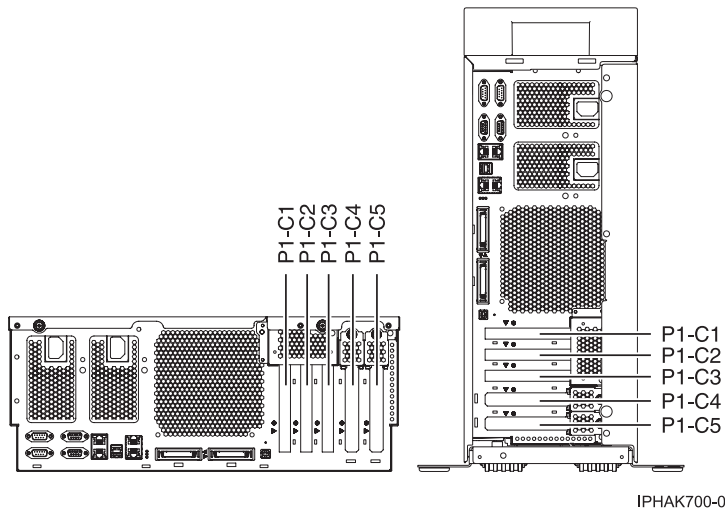


Figure 167. Model 9133-55A rack mounted and desktide system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 9. Model 9133-55A slot location description

PHB0			PHB2	PHB3		
Slot 1	Slot 2	Integrated Dual 1 Gb Ethernet	Slot 3	Slot 4	Slot 5	Integrated SCSI U320
Long	Long		Long	Short	Short	
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz	64-bit 3.3V, 266 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C1	Un-P1-C2		Un-P1-C3	Un-P1-C4	Un-P1-C5	

- Slots 1 through 5 are compatible with PCI and PCI-X adapters.
- Slot 5 can contain a PCI, PCI-X, or GX+ adapter. The location code for the GX+ slot is Un-P1-C6
- Slot 4 can contain a PCI, PCI-X, or GX+ adapter. The location code for the GX+ slot is Un-P1-C14

**Important:** Follow these rules when placing GX+ adapters:

- Since there are only two GX+ slots, first determine where you will place GX+ adapters, and then determine where to place PCI adapters.
- If the system has only one CPU card, the first GX+ adapter must go into slot 5.
- If the system has two CPU cards, and one GX+ adapter, the GX+ adapter can go into either slot 5 or slot 4. However, for best performance, place a single GX+ adapter into slot 4.
- If the system has two CPU cards, and two GX+ adapters, place the adapter that requires the highest bandwidth into slot 4. Place the other GX+ adapter into slot 5.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- The system supports up to a total of 8 expansion units; model D20.
- The model D20 expansion unit, with most its features, can migrate from other System p systems.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and the recommended maximum number of specified adapters.



**Note:** If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature code	Base unit slot priority	Maximum number of adapters allowed		
		Base unit	Per expansion unit	System
2843	3	1		
2842	3, 2	2		
6312	1, 2, 3	3		
5722**	3, 4, 1, 5, 2	3	4	16
5721**	3, 4, 1, 5, 2	3	4	16
1982**	3, 4, 1, 5, 2	2	2	18
5719**	3, 4, 1, 5, 2	2	2	18
1981**	3, 4, 1, 5, 2	2	2	18
5718**	3, 4, 1, 5, 2	2	2	18
1954*	4, 1, 3, 5, 2	4	2	21
5740 *	4, 1, 3, 5, 2	4	2	21
1983*	4, 1, 3, 5, 2	5	7	61
5706*	4, 1, 3, 5, 2	5	7	61
1984*	4, 1, 3, 5, 2	5	7	61
5707*	4, 1, 3, 5, 2	5	7	61
1978*	4, 1, 3, 5, 2	5	7	61
5700*	4, 1, 3, 5, 2	5	7	61
1979*	4, 1, 3, 5, 2	5	7	61
5701*	4, 1, 3, 5, 2	5	7	61
1910**	3, 4, 1, 5, 2	5	4	
5759**	3, 4, 1, 5, 2	5	4	
1905*	3, 4, 1, 5, 2	5	4	
5758*	3, 4, 1, 5, 2	5	4	
1986*	4, 1, 3, 5, 2	3	4	37
1987*	4, 1, 3, 5, 2	3	4	37
5713*	4, 1, 3, 5, 2	3	4	37
5714*	4, 1, 3, 5, 2	3	4	37
1977*	4, 5, 1, 2, 3	5	7	61
5716*	4, 5, 1, 2, 3	5	7	61
6239*	4, 5, 1, 2, 3	5	7	61
5902**	3,1,2	3		24
5912**	3, 4, 1, 5, 2	5		12
1913*	3, 1, 2	3		
5737*	3, 1, 2	3		
1912*	3, 4, 1, 5, 2	5	7	61
5736*	3, 4, 1, 5, 2	5	7	61
1974*	4, 5, 1, 2, 3	5		

5712*	4, 5, 1, 2, 3	5		
1975*	2, 1, 3	3		
5703*	2, 1, 3	3		
6230 *	2, 1, 3	3		
4764	4, 5, 1, 2, 3	5		32
6204	4, 5, 1, 2, 3	2		
1980	4, 5, 1, 2, 3	4		
2849	4, 5, 1, 2, 3	4		
6310	2, 1, 3	3		
2947	2, 1, 3	3		
2944	4, 5, 1, 2, 3	2		
4962	4, 5, 1, 2, 3	5		
1985	4, 5, 1, 2, 3	5		
4959	4, 5, 1, 2, 3	4		
2962	4, 5, 1, 2, 3	4		
2943	4, 5, 1, 2, 3	2		
2738	4, 5, 1, 2, 3	5		
5723	4, 5, 1, 2, 3	2	2	18
** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.				
* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.				
<sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.				

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total should include the two integrated Gb Ethernet ports on PHB 0.
- No more than three high bandwidth adapters per PHB; eight per entire system with one RIO-G loop; 16 per entire system with two RIO-G loops.
- No more than one Extra-high bandwidth adapter per PHB; two per base system; four per entire system with one RIO-G loop; eight per entire system with two RIO-G loops
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

## Model 9116-561 (p5 560Q) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

### System unit back view

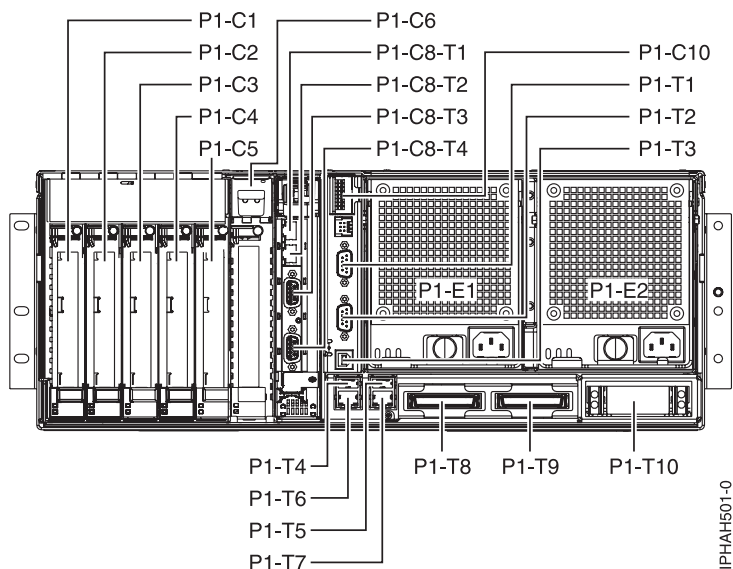


Figure 168. Rack mounted system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 10. Slot location description

PHB1				PHB2		
Slot 3	Slot 4	Slot 5	Slot 6	Slot 1	Slot 2	Integrated SCSI U320
Long	Long	Long	Short	Long	Long	
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz RIO-2	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6	Un-P1-C1	Un-P1-C2	

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slot C6 is a short slot.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)

### I/O expansion units

Systems with 1.8 GHz processor cards support 4 I/O expansion units per base system unit in a single loop when attached to the integrated RIO-2 ports. Two base system units can be connected to form one system that would support a total of 8 I/O expansion units.

The I/O expansion units can be either models D11 or D20. The maximum number of adapters per I/O expansion unit is the same as the maximum number of adapters per base system unit.

Expansion units are not supported on base system units with 1.5 GHz processors cards.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed per system unit** is blank, the limit is the number of slots available.

Feature Code	Suggested base system unit slot priority	Maximum number of adapters allowed per base system unit
5721**	1, 3, 4, 2, 5, 6	4
5722**	1, 3, 4, 2, 5, 6	4
1982**	1, 3, 4, 2, 5, 6	2
1981**	1, 3, 4, 2, 5, 6	2
5719**	1, 3, 4, 2, 5, 6	2
5718**	1, 3, 4, 2, 5, 6	2
1954*	3, 1, 4, 2, 5, 6	4
5740*	3, 1, 4, 2, 5, 6	4
1983*	3, 1, 4, 2, 5, 6	6
1984*	3, 1, 4, 2, 5, 6	6
5706*	3, 1, 4, 2, 5, 6	6
5707*	3, 1, 4, 2, 5, 6	6
1978*	3, 1, 4, 2, 5, 6	6
1979*	3, 1, 4, 2, 5, 6	6
5700*	3, 1, 4, 2, 5, 6	6
5701*	3, 1, 4, 2, 5, 6	6
1910**	1, 3, 4, 2, 5, 6	4
5759**	1, 3, 4, 2, 5, 6	4
1905*	3, 1, 4, 2, 5, 6	4
5758*	3, 1, 4, 2, 5, 6	4
1986*	3, 1, 4, 2, 5, 6	4
1987*	3, 1, 4, 2, 5, 6	4
5713*	3, 1, 4, 2, 5, 6	4
5714*	3, 1, 4, 2, 5, 6	4
1977 *	3, 1, 4, 2, 5, 6	6
5716 *	3, 1, 4, 2, 5, 6	6
6228 *	3, 1, 4, 2, 5, 6	6
6239 *	3, 1, 4, 2, 5, 6	6
5902**	3, 4, 1, 5, 2	5

5912**	3, 4, 1, 5, 2, 6	6
1913*	3, 4, 1, 5, 2	5
1912*	3, 4, 1, 5, 2, 6	6
5737*	3, 4, 1, 5, 2	5
5736*	3, 4, 1, 5, 2, 6	6
1974*	3, 4, 1, 5, 2, 6	6
5712*	3, 4, 1, 5, 2, 6	6
1975*	3, 4, 1, 5, 2	5
5703*	3, 4, 1, 5, 2	5
2498*	3, 4, 1, 5, 2	5
6203*	3, 4, 1, 5, 2	5
6230*	3, 4, 1, 5, 2	5
1980	6, 2, 5, 1, 4, 3	4
1985	6, 2, 5, 1, 4, 3	6
6204	6, 2, 5, 1, 4, 3	6
2738	6, 2, 5, 1, 4, 3	6
2848	6, 2, 5, 1, 4, 3	6
2849	6, 2, 5, 1, 4, 3	6
2944	6, 2, 5, 1, 4, 3	6
2943	6, 2, 5, 1, 4, 3	2
2946	6, 2, 5, 1, 4, 3	
4953	6, 2, 5, 1, 4, 3	
4957	6, 2, 5, 1, 4, 3	
4959	6, 2, 5, 1, 4, 3	
4960	6, 2, 5, 1, 4, 3	
4961	2, 5, 1, 4, 3	
4962	6, 2, 5, 1, 4, 3	
4963	6, 2, 5, 1, 4, 3	
2947	2, 5, 1, 4, 3	5
2962	6, 2, 5, 1, 4, 3	
5723	6, 2, 5, 1, 4, 3	2
2737	6, 2, 5, 1, 4, 3	4
* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.		
**Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.		
<sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.		

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. There are no integrated gigabit Ethernet ports attached to PHB 1 or PHB 2.
- No more than three high bandwidth adapters per PHB; five per base system unit.
- No more than one extra-high bandwidth adapter per PHB; two per base system unit; four per entire system with one RIO-G loop; eight per entire system with two RIO-G loops.
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9117-570 (p5 570) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

#### System unit back view

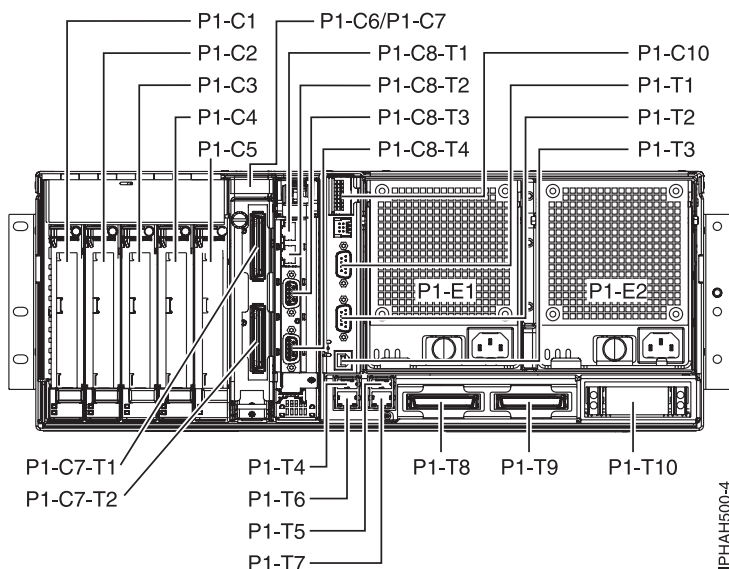


Figure 169. Model 570 rack mounted system unit back view with numbered slots.

#### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 11. Model 570 slot location description

PHB1				PHB2		
Slot 3	Slot 4	Slot 5	Slot 6	Slot 1	Slot 2	Integrated SCSI U320
Long	Long	Long	Short	Long	Long	
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz RIO-2	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz
Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6	Un-P1-C1	Un-P1-C2	

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slot C6 is a short slot. This space can be occupied by an adapter or a high-speed link (RIO-2) card.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- The system supports up to a total of 4 base units connected to up to a total of 20 expansion units, models D10, D11, and D20. The first base unit supports up to a total of 8 expansion units, the next 3 base units can support up to a total of 4 expansion units each.
- The model D10 and model D20 expansion unit, with most its features, can migrate from other System p systems.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, the limit is the number of slots available.

Feature Code	Suggested system unit slot priority	Maximum number of adapters allowed		
		Per base unit	Per expansion unit	System
6312 <sup>1</sup>		0	4	4 per attached expansion-unit
5721 <sup>**</sup>	1, 3, 2, 4, 5, 6	4	4	20
5722 <sup>**</sup>	1, 3, 2, 4, 5, 6	4	4	20
5719 <sup>**</sup>	1, 3, 2, 4, 5, 6	2	2	
5718 <sup>**</sup>	1, 3, 2, 4, 5, 6	2	2	
5740 <sup>*</sup>	1, 3, 2, 4, 5, 6	4		
5707 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
5706 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
5701 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
5700 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
5759 <sup>**</sup>	1, 3, 2, 4, 5, 6	4	4	
5758 <sup>*</sup>	3, 4, 1, 5, 2, 6	4	4	
5713 <sup>*</sup>	3, 4, 1, 5, 2, 6	4	4	84
5714 <sup>*</sup>	3, 4, 1, 5, 2, 6	4	4	84
5716 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
6239 <sup>*</sup>	3, 4, 1, 5, 2, 6	6		
6228 <sup>*</sup>	3, 4, 1, 5, 2, 6	0		
5902 <sup>**</sup>	3, 4, 1, 5, 2	5		48

5912**	3, 4, 1, 5, 2, 6	6		24
5737*	3, 4, 1, 5, 2	5		
5736*	3, 4, 1, 5, 2, 6	6		
5712*	3, 4, 1, 5, 2, 6	6		62
5703*	3, 4, 1, 5, 2	5		61
2946*	3, 4, 1, 5, 2, 6	6		20
6230*	3, 4, 1, 5, 2	0		103
4764	6, 2, 5, 1, 4, 3	6		32
2498	2, 5, 1, 4, 3	0		103
2737	6, 2, 5, 1, 4, 3	4		8
2738	6, 2, 5, 1, 4, 3	6		8
2848	6, 2, 5, 1, 4, 3	6		8
2849	6, 2, 5, 1, 4, 3	6		8
2943	6, 2, 5, 1, 4, 3	2		42
2944	6, 2, 5, 1, 4, 3	2		42
2947	2, 5, 1, 4, 3	5		19
2962	6, 2, 5, 1, 4, 3	4		44
4953	6, 2, 5, 1, 4, 3	6		20
4957	6, 2, 5, 1, 4, 3	6		20
4959	6, 2, 5, 1, 4, 3	6		20
4960	6, 2, 5, 1, 4, 3	6		32
4961	2, 5, 1, 4, 3	5		79
4962	6, 2, 5, 1, 4, 3	6		
4963	6, 2, 5, 1, 4, 3	6		32
4964	2, 5, 1, 4, 3	5		
5723	6, 2, 5, 1, 4, 3	2		42
6203	2, 5, 1, 4, 3	5		79
6204	6, 2, 5, 1, 4, 3	6		42

\* High Bandwidth (HB) adapter. See the *Performance notes* before installing this adapter.

\*\*Extra-high Bandwidth (EHB) adapter. See the *Performance notes* before installing this adapter.

<sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. There are no integrated gigabit Ethernet ports attached to PHB 1 or PHB 2.
- No more than three high bandwidth adapters per PHB; five per base system; eight per entire system with one RIO-G loop; 16 per entire system with two RIO-G loops.



- No more than one extra-high bandwidth adapter per PHB; two per base system; four per entire system with one RIO-G loop; eight per entire system with two RIO-G loops.
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9118-575 (p5 575) adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

#### System unit back view

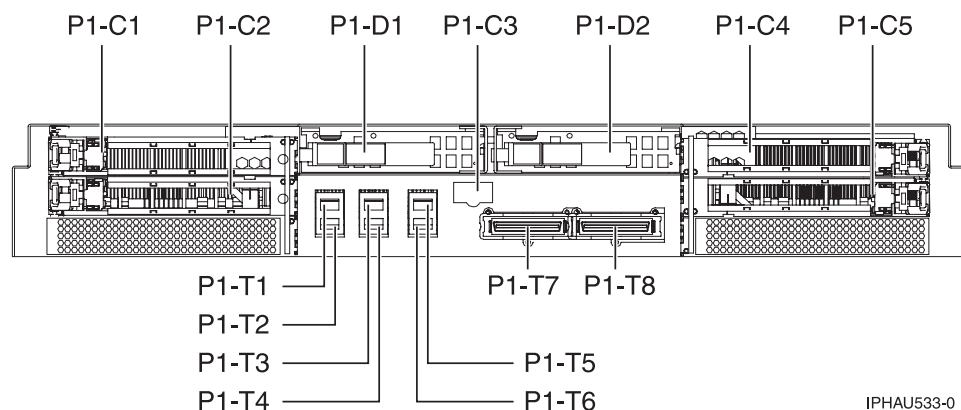


Figure 170. Model 9118-575 rack mounted system unit back view with four PCI slots available.

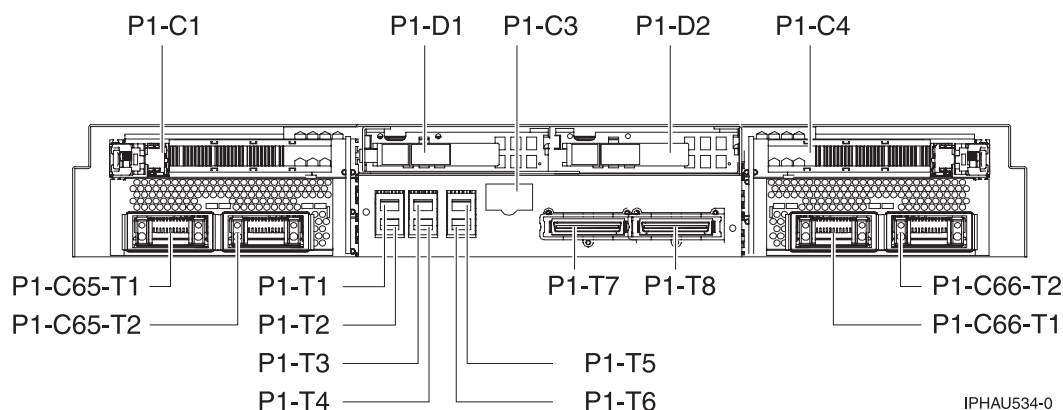


Figure 171. Model 9118-575 rack mounted system unit back view with two PCI slots available and two IXS slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 12. Model 9118-575 System p slot location description

PHB1		PHB2	
Slot 1	Slot 2	Slot 4	Slot 5
Long	Long or IXS	Long	Long or IXS
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2	Un-P1-C4	Un-P1-C5

- Slots 1, 2, 4 and 5 are compatible with PCI and PCI-X adapters.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- If feature 7910 is present in the system, it can block the use of slot 2 or slot 5.
- The base unit will support 1 expansion unit; models 5791, 5794, and 7040-61D.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended.

Feature Code	Suggested system unit slot priority	Maximum number of adapters allowed		
		Base Unit	Expansion Unit	System
5721**	1, 4, 2, 5	4	12	16
5722**	1, 4, 2, 5	4	12	16
5719**	1, 4, 2, 5	2	6	8
5718**	1, 4, 2, 5	2	6	8
5740*	1, 4, 2, 5	4	6	10
5707*	1, 4, 2, 5	4	12	16
5706*	1, 4, 2, 5	4	12	16
5701*	1, 4, 2, 5	4	12	16
5700*	1, 4, 2, 5	4	12	16
5759**	1, 4, 2, 5	4	12	16

5758*	1, 4, 2, 5	4	12	16
5713*	1, 4, 2, 5	4	12	16
5714*	1, 4, 2, 5	4	12	16
5716*	1, 4, 2, 5	4	20	24
6239*	1, 4, 2, 5	0	20	20
6228*	1, 4, 2, 5	0	20	24
5711*	1, 4, 2, 5	4	20	24
5736*	1, 4, 2, 5	4	20	24
5737*	1, 4, 2, 5	4	20	24
5710*	1, 4, 2, 5	4	20	24
2946*	1, 4, 2, 5	0	20	20
6230*	1, 4, 2, 5	0	12	12
2737	1, 4, 2, 5	0	8	8
2738	1, 4, 2, 5	4	4	8
2848	1, 4, 2, 5	0	4	4
2849	1, 4, 2, 5	4	4	8
2943	1, 4, 2, 5	4	20	24
2944	1, 4, 2, 5	4	20	24
2947	1, 4, 2, 5	4	16	20
2962	1, 4, 2, 5	4	20	24
4963	1, 4, 2, 5	0	8	8
4953	1, 4, 2, 5	0	20	20
4957	1, 4, 2, 5	0	20	20
4959	1, 4, 2, 5	4	20	24
4960	1, 4, 2, 5	0	8	8
4961	1, 4, 2, 5	0	20	20
4962	1, 4, 2, 5	4	20	24
4963	1, 4, 2, 5	0	8	8
4964	1, 4, 2, 5	0	8	8
5723	1, 4, 2, 5	4	20	24
6203	1, 4, 2, 5	0	10	10
6204	1, 4, 2, 5	1	10	11
** Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.				
* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.				
<sup>1</sup> Digital Trunk adapters have an internal cable and must be in contiguous slots.				

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. There are no integrated gigabit Ethernet ports attached to PHB 1 or PHB 2.
- No more than three high bandwidth adapters per PHB.
- No more than one Extra-high bandwidth adapter per PHB; two per base system; four per entire system with one RIO-G loop.
- No more than one 10Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If an extra high-performance adapter is placed in the system, it must be the only extra high-performance or high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be an extra high-performance or high-performance adapter.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### **Model 9119-590 (p5 590) or 9119-595 (p5 595) adapter placement**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

PCI adapters connected to the model 590 or 595 system units are placed in expansion units. For information about PCI adapter placement for these systems, see “Expansion units 5791, 5794, and 7040-61D.”

### **PCI adapter placement for expansion units**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

#### **Expansion units 5791, 5794, and 7040-61D:**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

This topic is divided into five sections:

- “Overview”
- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

#### **Overview**

The model 5791 and 5794 expansion units can be ordered for the following list of IBM System p5<sup>®</sup> servers:

- The model 575 can support 1 expansion unit.
- The model 590 can support up to a total of 8 expansion units.
- The model 595 can support up to a total of 12 expansion units.

The model 7040-61D expansion unit can be migrated to these servers, provided the 7040-61D contains the PCI-X planar (FC 6571). Expansion units with the non-PCI-X planar (FC 6563) cannot be migrated.

## Expansion unit back view

The following figure shows a back of view of the expansion unit with numbered PCI slots. The PCI slots are divided into 2 planars and 6 PCI host buses (PHBs) as shown in the illustration and described in the list that follows the illustration.

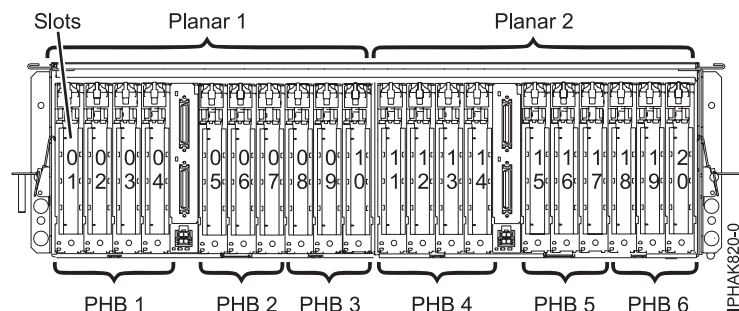


Figure 172. 7040-61D expansion unit back view with numbered slots.

## PCI slot descriptions

The following list describes the PCI slots.

- All slots are:
  - Long
  - PCI-X
  - 3.3V
  - 64-bit
  - 133 MHz.
- The slots are divided into 2 planars and 6 PHBs as follows:
  - Planar 1:
    - PHB 1: slots 1, 2, 3, 4
    - PHB 2: slots 5, 6, 7
    - PHB 3: slots 8, 9, 10
  - Planar 2:
    - PHB 4: slots 11, 12, 13, 14
    - PHB 5: slots 15, 16, 17
    - PHB 6: slots 18, 19, 20
- All slots are compatible with PCI or PCI-X adapters.
- Short adapters can go in long slots.
- All slots support Enhanced Error Handling (EEH).

## Recommended system unit slot placement and maximums

The following table lists the adapter feature codes that can be used in this expansion unit and the recommended slot placement and maximums.

Feature Code	Expansion unit slot priority	Expansion unit maximum	System maximum
		These maximums are for connectivity	
5721**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 120 for model 595</li> <li>• 60 for model 590</li> </ul>

5722**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 120 for model 595</li> <li>• 60 for model 590</li> </ul>
5719**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	4	<ul style="list-style-type: none"> <li>• 24 for model 595</li> <li>• 16 for model 590</li> </ul>
5718**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	4	<ul style="list-style-type: none"> <li>• 24 for model 595</li> <li>• 16 for model 590</li> </ul>
5740 *	1 ,5,8, 11, 15, 18, 2, 6, 9, 12, 16, 19, 3, 7, 10, 13, 17, 20, 4, 14	12	<ul style="list-style-type: none"> <li>• 120 for model 595</li> <li>• 60 for model 590</li> </ul>
5707*	1, 11 ,6, 16, 9, 19, 2, 12, 7, 17, 4, 14	12 for model 590/595 6 (for 1 planar expansion) for model 575	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> <li>• 16 (node maximum) for model 575</li> </ul>
5706*	1, 11 ,6, 16, 9, 19, 2, 12, 7, 17, 4, 14	12 for model 590/595 6 (for 1 planar expansion) for model 575	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> <li>• 16 (node maximum) for model 575</li> </ul>
5701*	1, 11 ,6, 16, 9, 19, 2, 12, 7, 17, 4, 14	12 for model 590/595 6 (for 1 planar expansion) for model 575	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> <li>• 16 (node maximum) for model 575</li> </ul>
5700*	1, 11 ,6, 16, 9, 19, 2, 12, 7, 17, 4, 14	12 for model 590/595 6 (for 1 planar expansion) for model 575	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> <li>• 16 (node maximum) for model 575</li> </ul>
5759**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> </ul>
5758*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> </ul>
5713*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> </ul>
5714*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	<ul style="list-style-type: none"> <li>• 144 for model 595</li> <li>• 96 for model 590</li> </ul>
5716*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	<ul style="list-style-type: none"> <li>• 192 for model 595</li> <li>• 160 for model 590</li> </ul>
6228*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20		
6239*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20		
5902**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	<ul style="list-style-type: none"> <li>• 96 for model 595</li> <li>• 64 for model 590</li> </ul>
5912**	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	<ul style="list-style-type: none"> <li>• 48 for model 595</li> <li>• 32 for model 590</li> </ul>

5736*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20		
5737*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20		
5710*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	62
5711*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	62
6203*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	20	62
6230*	1, 11 , 5, 15 , 8, 18, 2, 12, 6, 16, 9, 19, 3, 13, 4, 14, 7, 17, 10, 20	12	12
4764	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	8	32
2737	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	4	16
2738	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	4	16
2848	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	4	16
2849	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	4	16
2943	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	32
2944	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	32
4953	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
4957	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
4960	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
4961	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
4963	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
4964	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		

2946	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11		
2947	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	16	16
2962	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	32
4959	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	20
4962	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	<ul style="list-style-type: none"> <li>• 192 for model 595</li> <li>• 160 for model 590</li> </ul>
5723	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	32
6204	10, 20, 9, 19, 8, 18, 7, 17 , 6, 16, 5, 15, 4, 14, 3, 13, 2, 12, 1, 11	20	32
<p>**Extra-high Bandwidth (EHB) adapter. See the <i>Performance notes</i> before installing this adapter.</p> <p>* High Bandwidth (HB) adapter. See the <i>Performance notes</i> before installing this adapter.</p>			

For more information about the adapters that are listed, see “IBM System p5 and eServer p5 PCI and PCI-X adapters” on page 210.

### Performance notes (for optimum performance)

For optimum performance, follow these guidelines:

- No more than three Gb Ethernet ports per PHB.
- No more than three high bandwidth adapters per PHB.
- No more than one Extra-high bandwidth adapter per PHB.
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.
- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.
- If a model 5718 or 5719 adapter is placed in the system, it must be the only high-performance adapter attached to the PHB it uses. No other adapters attached to the same PHB as one of these adapters can be a high-performance adapter.

**Note:** The combined cumulative total for feature 5718, 5719, 5721, and 5722 is 12.

### D11 expansion unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

### System unit back view



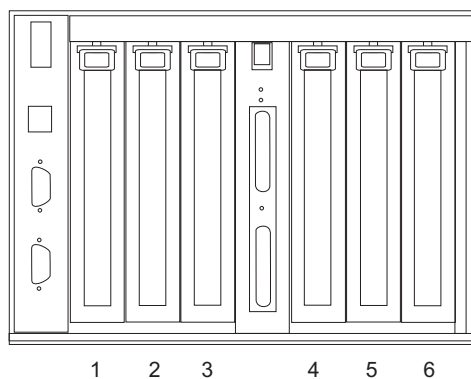


Figure 173. Model D11 expansion unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 13. Model D11 expansion unit slot location description

PHB1			PHB2		
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Long	Long	Long	Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2	Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)

### Recommended system unit slot placement and maximums

- Slot priority for all adapters is: 1, 4, 2, 5, 3, 6
- For a list of supported adapters, refer to the placement information for the base system unit the expansion unit is attached to. If the adapter is support by the base unit, it is supported by the expansion unit. If the adapter is not supported by the base unit, it is not supported by the expansion unit.

### D20 expansion unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

### System unit back view

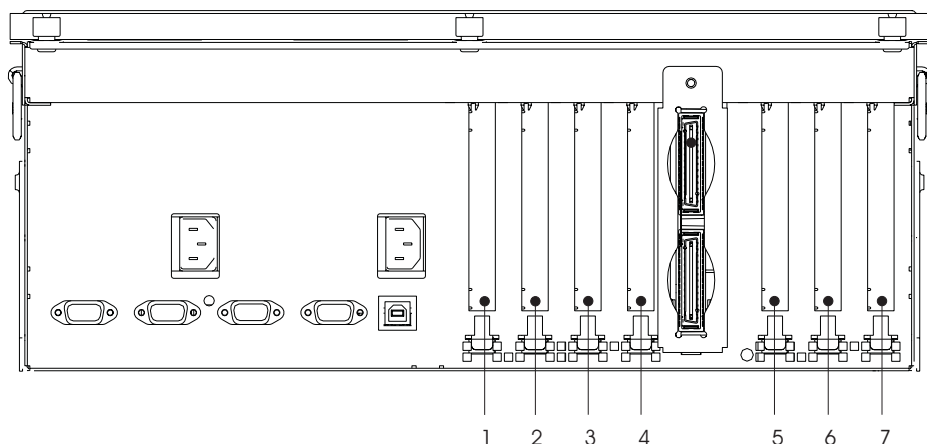


Figure 174. D20 expansion unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 14. Model D20 expansion unit slot location description

PHB1				PHB2		
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
Long	Long	Long	Long	Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2	Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6	Un-P1-C7

- Slots 1 through 7 are compatible with PCI and PCI-X adapters.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)

### Recommended system unit slot placement and maximums

- Slot priority for all adapters is: 1, 5, 2, 6, 3, 7, 4
- For a list of supported adapters, refer to the placement information for the base system unit the expansion unit is attached to. If the adapter is support by the base unit, it is supported by the expansion unit. If the adapter is not supported by the base unit, it is not supported by the expansion unit.

## PCI adapter placement for IBM System i5 and eServer i5 system units and expansion units

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

To determine the slot placement of PCI adapters in IBM System i5<sup>®</sup> and eServer<sup>™</sup> i5 system units and expansion units, use the instructions in the following procedures.

### Find your current system configuration in i5/OS

You can use the System Service Tools in i5/OS to find your current system configuration.

Before you begin, you need to know the location codes used for the PCI adapter slots on the system with which you are working. For example, on a model 520 system, there are 6 PCI adapter slots in the system unit. The location codes are P1-C1, P1-C2, P1-C3, .P1-C4, P1-C5, and P1-C6. To find location codes for

another system, see the tables in “Configuration tables for IBM System i5 and eServer i5 system units and expansion units” on page 277. Additional information about location codes can be found in the topic Finding part locations.

To find your current system configuration, start an i5/OS session and sign on. If you have more than one system, start a session on the system that is being upgraded and for which you have service tools authority.


1. Type **strsst** on the command line of the Main Menu and press Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display and press Enter.
3. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
4. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display and press Enter.
6. Type **9** on the **System Unit** line and press Enter.
7. Select **Include empty positions**.
8. Look for the PCI adapter location codes in the Location column.
9. Write down the Type-Model number for each PCI adapter location. Some adapters can show multiple, virtual ports. It is not necessary to write down these virtual locations.
10. Write down any PCI adapter locations that are listed in the Description column as an Empty Position. The Type-Model number is blank for empty positions.
11. Press F12 to return to the previous window.
12. Do you have an expansion unit attached?
  - **No:** Go to “Determine the best place to install your adapter.”
  - **Yes:** Do the following:
    - a. Type **9** for the **System Expansion Unit** field and press Enter.
    - b. Repeat steps 7-11 each expansion unit.
    - c. Go to “Determine the best place to install your adapter.”

## Determine the best place to install your adapter

You can use the placement guidelines and detailed reference tables in this section to determine the best place to install your adapter.

### Important:

- Be sure to use the System Planning Tool to validate your adapter placement. Go to the Dynamic Logical Partitioning Web site at

<http://www-03.ibm.com/servers/eserver/support/tools/systemplanningtool/> .

- If you are installing a new feature, ensure that you have the software required to support the new feature and that you determine if there are any existing PTF prerequisites. To do this, use the IBM eServer Prerequisite Web page at [www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf).

Be aware that the PTFs required to be install a feature can vary depending on the type of devices or towers attached to the adapter. An example is FC 0300 which indicates the 5736/5775 is being used with the TotalStorage EXP24 Disk Enclosure 5786/5787. FC 0300 has specific PTFs for the 5736/ 5775 when it is being used with the 5786/5787.

### Remember:

- Adapters have different capabilities. Some adapters are 32 bit, some are 64 bit. Adapters also run at different frequencies, some at 33 MHz, 66 MHz, 133 MHz and 266 MHz. Systems and towers also have adapter slots that come in the same bit lengths and frequencies. For best performance the adapters

should be placed in a slot with the same characteristics as the adapter. To the extent that an adapter does not match the slot, the performance may be reduced.

- In the 5074/5079 tower there are some 5V slots. You cannot place 3V (3.3V) adapters in these slots. To identify these slots, see “5074 expansion unit” on page 290 and “5079 expansion unit” on page 291.
- When using the TotalStorage<sup>®</sup> EXP24 Disk Enclosure 5786/5787, there are specific feature codes needed depending on the adapter being used with the enclosure:
  - Feature code 0300 indicates the 5736/5775 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.
  - Feature code 0301 indicates the 5737/5776 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.
  - Feature code 0310 indicates the 5739/5778 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.

Before installing these features, check for PTFs.

- For optimal adapter performance use the following placement guidelines, which are for adapters that are moderately to highly active.
  - Place high-bandwidth and extra-high bandwidth adapters in PCI-X slots in the system unit first, and then PCI-X slots in the expansion units.
  - Limit one extra-high performance adapter per multi-adapter bridge, with no other extra-high performance adapters on the same multi-adapter bridge.
  - Limit to 2 the number of high-bandwidth adapters per multi-adapter bridge with no other extra-high bandwidth adapters in the same multi-adapter bridge.
  - Spread out high-bandwidth and extra-high bandwidth adapters across multi-adapter bridges, towers/drawers and HSL(-2) loops. Place the towers/drawers with the most high-bandwidth and extra-high bandwidth adapters closest to the CEC on the HSL(-2) loops.
  - See the Performance Capabilities Reference publication for more information on optimizing performance. (<http://www-03.ibm.com/servers/eserver/series/perfmgmt/resource.html>)
- 1. Are you installing an IOPless IOA? (Examples of IOPless IOAs include: 06xx, 4806, 5583, 5706, 5707, 5721, 5722, 5775, 5776, 5904, 5906, 5908, 6800, 6801, 6803/9493, and 6804/9494. )
  - **No:** Continue with the next step.
  - **Yes:** These do not require an IOP. Select an available slot using the “Configuration tables for IBM System i5 and eServer i5 system units and expansion units” on page 277 and return to the PCI adapter installation instructions that sent you here.

Maximum total of three IXS 2790/2890, 2791/2891, 2792/2892, 2799/2899, 4710/4810, 4811/4812/4813/9744/9812/9813 in any combination per 5074/5079/0574, 5088/0588, 5094/0694/5294, 8294/9194 tower.

- 2. Are you installing a 289x or 4810 feature?
  - **No:** Continue with the next step.
  - **Yes:** The 289x and 4810 IOP (IXS) adapter are customer installable unless the 289x or 4810 is being installed in a 5074, 5079, 5294, 9194, 8294, or 5094 expansion unit, contact your service provider to install the feature.
    - You might need to install memory on the 289x or 4810 IOP (IXS) adapter.
    - The 289x and 4810 are not installable in the 52x, 550, and 570 system units.
    - In the expansion units, the 2890, 2891, and 2899 adapters occupy two adapter positions, and a third adapter position is reduced to a short adapter position. The 2892 and the 4810 occupy two adapter positions.
    - For feature 2890, 2891, and 2899, place the first LAN IOA in the short adapter position following the IXS. All IXS LAN adapters must be in the same multi-adapter bridge as the IXS.
    - If you have a second LAN, place that adapter in the next position.
    - If you have a third LAN, place that adapter in the next position.

- Check your current system configuration to see if the IXS position and the LAN IOA position are available. If not, you need to move adapters. For more information on how to remove and replace adapters, see “PCI adapters” on page 1.

Continue to step 4.

3. Are you installing a 2843, 2847, or 2844 IOP feature?

**Yes:** Continue with the next step.

**No:** Go to step 6 on page 259.

4. Use Table 15 to locate the values of your current configuration, then continue to the next step.

**Note:**

- You can install the IOP in any adapter position labeled **IOP**. Refer to “Configuration tables for IBM System i5 and eServer i5 system units and expansion units” on page 277 for the IOP locations.
- You might need to move an IOA to install your IOP. If you need to move an IOA, go to step 6 on page 259 to determine where to move the adapter.
- By installing an IOP, you are creating a new IOP adapter group.
- IOPs cannot be placed in consecutive positions. IOPs can be placed in the position following 2792, 2892, 4710, or 4810.
- You can install features 289x and 4810 only in any adapter position labelled IXS.

*Table 15. IOP adapter numbers, names, memory values, performance values, and restrictions*

Feature number	CCIN	Description	Restrictions	Max number IOAs	Memory value	Perf. value
2790 2791 2799	2890–001 2890–002 2890–003	PCI Integrated xSeries® Server	<ul style="list-style-type: none"> <li>• Not customer installable.</li> <li>• These features get converted.</li> </ul>	3		
2792	2892–001	PCI Integrated xSeries Server	<ul style="list-style-type: none"> <li>• Not customer installable.</li> <li>• These features get converted.</li> </ul>	3		
2842	2842	PCI Node Input/Output Processor (IOP)	<b>Not supported</b> with 5xx systems and attached expansion-units.	4	100	100
2843	2843	PCI Node Input/Output Processor (IOP)	<ul style="list-style-type: none"> <li>• IOPs cannot be placed in consecutive positions.</li> <li>• 3 volt slot required, short or long slot</li> </ul>	4	211	100
2847	2847	PCI IOP for SAN Load Source	<ul style="list-style-type: none"> <li>• This is a dedicated IOP for SAN load Source and is only supported with 2766, 2787, and 5760 IOAs</li> <li>• IOP can not be placed where embedded adapters require an IOP, therefore, do not place this IOP in the following system slots: <ul style="list-style-type: none"> <li>– 52x: slots C6, C5, or C3.</li> <li>– 550: slots C1 and C2</li> <li>– 570: slots C1 and C2</li> </ul> </li> </ul>	1		

Table 15. IOP adapter numbers, names, memory values, performance values, and restrictions (continued)

Feature number	CCIN	Description	Restrictions	Max number IOAs	Memory value	Perf. value
2844 9744 9844	2844	PCI Input/Output Processor	<ul style="list-style-type: none"> <li>IOPs cannot be placed in consecutive positions.</li> <li>3 volt slot required, short or long slot</li> </ul>	4	211	100
2890 2891 2899	2890-001 2890-002 2890-003	PCI Integrated xSeries Server Input/Output Processor (IOP)	<ul style="list-style-type: none"> <li>Only customer installable in 0595, 5095, and 5088.</li> <li>An authorized service representative must install or remove this adapter in the model 5074, 5079, 5094, 9194, 8294. and 5294 expansion unit.</li> <li>Maximum total of three IXS 2790/2890, 2791/2891, 2792/2892, 2799/2899, 4710/4810, 4811/4812/4813/9744/9812/9813 in any combination per 5078/0578, 5074/5079/0574, 5088/0588, 5094/0694/5294, 8294/9194 tower.</li> <li>IOPs cannot be placed in consecutive positions.</li> <li>Only 2744, 2743, 2760, 4838 IOAs can be added in the same CCIN 2890 adapter group.</li> <li>Two positions are used by the CCINs 2890 adapter and the third position is reduced to half length.</li> </ul>	3		
2892	2892-001	PCI Integrated xSeries Server	<ul style="list-style-type: none"> <li>Only customer installable in 0595, 5095, and 5088.</li> <li>An authorized service representative must install or remove this adapter in the model 5074, 5079, 5094, 5294, 9194, and 8294 expansion unit.</li> <li>Maximum total of three IXS 2790/ 2890, 2791/ 2891, 2792/ 2892, 2799/ 2899, 4710/ 4810, 4811/ 4812/ 4813/ 9744/ 9812/ 9813 in any combination per 5078/ 0578, 5074/ 5079/ 0574, 5088/0588, 5094/0694/5294, 8294/9194 tower.</li> <li>Only 2744, 5700, 5701 IOAs can be added in the same IOP adapter group.</li> <li>Two positions are used by the 2892 and the 4810 adapter.</li> </ul>	3		

Table 15. IOP adapter numbers, names, memory values, performance values, and restrictions (continued)

Feature number	CCIN	Description	Restrictions	Max number IOAs	Memory value	Perf. value
4710	2892-002	PCI Integrated xSeries Server	<ul style="list-style-type: none"> <li>Not customer installable.</li> <li>These features get converted.</li> <li>Maximum total of three IXS 2790/2890, 2791/2891, 2792/2892, 2799/2899, 4710/4810, 4811/ 4812/ 4813/ 9744/ 9812/ 9813 in any combination per 5078/0578, 5074/ 5079/ 0574, 5088/0588, 5094/0694/ 5294, 8294/9194 tower.</li> </ul>	3		
4810	2892-002	PCI Integrated xSeries Server	<ul style="list-style-type: none"> <li>Only customer installable in 0595, 5095, and 5088.</li> <li>Only 2744, 5700, 5701 IOAs can be added in the same IOP adapter group.</li> <li>Two positions are used by the 2892 and the 4810 adapter.</li> <li>An authorized service representative must install or remove this adapter in the model 5074, 5079, 5094, 9194, 9294, and 5294 expansion unit.</li> <li>Maximum total of three IXS 2790/2890, 2791/2891, 2792/2892, 2799/2899, 4710/4810, 4811/ 4812/ 4813/ 9744/ 9812/ 9813 in any combination per 5078/0578, 5074/5079/0574, 5088/0588, 5094/0694/5294 8294/9194 tower.</li> </ul>	3		

5. To install your IOP adapter, return to the PCI adapter installation instructions that sent you here.
  6. When going through the following steps, refer to the "Examples of placement tables" on page 296 to determine the best place to install or move your IOA, using the adapter information in the "Configuration tables for IBM System i5 and eServer i5 system units and expansion units" on page 277 (entered at step 8 on page 255 of "Find your current system configuration in i5/OS" on page 254).
    - a. Locate the first IOP (2843, 2844).
    - b. Determine the IOAs controlled by the IOP (IOP adapter group).
      - An IOP adapter group is an IOP and all IOAs controlled by that IOP.
      - IOP adapter groups cannot cross PCI bridge set boundaries. Refer to "Configuration tables for IBM System i5 and eServer i5 system units and expansion units" on page 277.
      - The Model 52x, 550, and 570 system units have integrated SCSI controllers. If the integrated SCSI controller is being used with an IOP, be sure to include this adapter when determining IOP memory and performance limits.
    - c. Locate the first IOP adapter group that has an empty position.
    - d. Find and enter (on the placement table) the values of each IOA that is currently installed in this IOP adapter group that has an empty position. Use Table 16 on page 260 to find the values.
    - e. Install the new adapter in the next available position in the IOP adapter group. Do not leave open positions if possible.
- You should try to not move your console position.



- f. Write down the feature number or CCIN of the new adapter in the table.
- g. Find and enter the values of the new adapter in the placement table.
- h. Add together the *IOA Memory Value* and record it in the *IOA totals*.
- i. Add together the *IOA Performance Value* and record it in the *IOA totals*.
- j. If the totals are not greater than the value of the IOP for that adapter group, verify the restrictions, such as adapter length, to make sure the adapter can be installed in the empty position. If the restrictions are not met, choose another empty position and repeat the process. Otherwise, you are ready to install the new adapter in that empty position.
- k. If the totals are greater than either IOP adapter value, move to the next available IOP adapter group that has an empty adapter position and repeat the steps to complete another placement worksheet.
- l. Return to the PCI adapter installation instructions that sent you here.

*Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values*

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
0092	2689	Integrated Adapter for xSeries		Long		
2742	2742	PCI Two-line WAN		Short	15	14
2743	2743	PCI Ethernet/IEEE 802.3 adapter	Only TCP/IP supported. These restrictions do not apply if 2743 is part of a CCIN 2890 IOP adapter groups. <ul style="list-style-type: none"> <li>• Do not place in a 5V position.</li> <li>• Place in a 64-bit position.</li> <li>• An IOP with a 2743 supports a maximum of one other IOA of any kind.</li> </ul>	Short	2	26
2744	2744	PCI 100/16/4MB Token-Ring	A maximum of two 4838, 4805, 2849, and 2744 in any combination allowed per IOP, except for CCIN 289x and 4810 IOPs.	Short	25	36
2749	2749	PCI Ultra Magnetic Media Controller		Short	22	25
2757	2757	PCI-X Ultra RAID Disk Unit Controller	See Restriction footnotes.	Long	29	30
2760	2760	PCI 1 Gbps Ethernet UTP	These restrictions do not apply if 2760 is part of a CCIN 2890 IOP adapter group. <ul style="list-style-type: none"> <li>• Do not place in a 5V position.</li> <li>• Place in a 64-bit position.</li> <li>• An IOP with a 2743 supports a maximum of one other IOA of any kind.</li> </ul>	Short	2	26
2763	2763	PCI 2-Port RAID Disk Unit Controller	Use only in0595 and 5095. A maximum of two allowed per IOP.	Long	29	21



Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
2765	2765	PCI Fibre Channel Tape Controller	For best performance, place in a 64-bit position.  There can be a maximum of two 2765, 2766, 2787, 5704, 5760, or 5761 adapters (any combination) per PCI bridge set boundary.	Short	36	50
2766	2766	PCI Fibre Channel Disk Unit Controller	For best performance, place in a 64-bit position.  Only one per IOP and no other IOAs.  This IOA can be used in Multipath configurations. To improve the availability provided by Multipath configurations, it is recommended that each IOA and its IOP be placed on separate HSL loops, in different expansion units or on different multi-adapter bridges.  See Restriction footnotes.	Short		
2768	2768	Magnetic Media Controller	<b>Attention:</b> you cannot use this adapter with 5xx systems. Do not plug this adapter into 5xx system units or damage might result.			
2772	2772	Dual WAN/Modem Adapter	Non-CIM (complex impedance matching).	Short	15	14
2773	2773	Dual WAN/Modem Adapter	CIM (complex impedance matching).	Short	15	14
2780	2780	PCI-X Ultra 4 RAID Disk Unit Controller	See Restriction footnotes.	Long	29	30
2782	2782	PCI-X RAID Disk Unit Controller	See Restriction footnotes.	Long	29	21

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
2787	2787	PCI-X Fibre Channel Disk Unit Controller	For best performance, place in a 64-bit position.  Only one per IOP and no other IOAs.  A maximum of two 2765, 2766, 2787, or 5704 (any combination) per PCI bridge set boundary.  This IOA can be used in Multipath configurations. To improve the availability provided by Multipath configurations, it is recommended that each IOA and its IOP be placed on different HSL loops, in different expansion units or on different multi-adapter bridges.	Short		
2793	2793	PCI 2-Line WAN with Modem	Non-CIM (complex impedance matching)	Short	15	14
2794	2793	PCI 2-Line WAN with Modem	CIM (complex impedance matching)	Short	15	14
2805	2805	PCI Quad Modem IOA	Non-CIM (Complex impedance matching)	Long	15	14
2806	2805	PCI Quad Modem IOA	CIM (Complex impedance matching)	Long	15	
2849	2849	PCI 100/10 Mbps Ethernet	A maximum of two 2849 and 2744 in any combination allowed per IOP.	Short	25	36
2886/ 9876	2886	Optical Bus Adapter				
2887/ 9887	2887	HSL-2 Bus Adapter				
4723	2723	PCI Ethernet/IEEE 10		Short	25	12
4745	2745	PCI Two-Line		Short	15	14
4746	9746	PCI Twinaxial Workstation Controller		Short	10	6
4728/ 9748	2748	PCI RAID Disk Unit Controller	See Restriction footnotes.  Not supported in 5xx system units.	Long	29	21
4778/ 9778	2778/ 4778/ 9778	PCI RAID Disk Unit Controller	See Restriction footnotes.  Not supported in 5xx system units.	Long	29	25
4801	4758	PCI Cryptographic Coprocessor	Cannot be controlled by the load source IOP.	Short	11	18

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
4805	2058	PCI Cryptographic Accelerator	Cannot be controlled by the load source IOP.  A maximum of two 4805, 5700, or 5701 in any combination per IOP	Short	2	26
4811 4812 4813 9812 9813	4812	PCI Integrated xSeries Server	Maximum of 1 per IOP.  Requires 2 consecutive long slots.  For 5xx system units, must be placed in the following slots: <ul style="list-style-type: none"> <li>• 52x; C04 (feature code 4811), unless you have the 1.9 GHz model 520 then, place 4811 starting in C05.</li> <li>• 550; C02</li> <li>• 570; C04 (requires blind swap cassette, feature code 4813)</li> <li>• 590; no restrictions</li> </ul> Requires feature 2844 to serve as the IOP.  Requires 3.3 v PCI slot.  64 bit slot recommended for best performance, but not required.	Long, double-width	25	51
4838	2838	PCI 100/10 Mbps Ethernet	A maximum of two 4838, 2849, and 2744 in any combination allowed per IOP, except for CCIN 2890 IOPs.	Short	25	36
5580	N/A	2780 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 5708)	See Restriction footnotes.	Long	29	30
5581	N/A	2757 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 5708)	See Restriction footnotes.	Long	29	30
5582	N/A	5738 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 574F)	See Restriction footnotes.	Long	29	30
5583	N/A	5738 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 574F)	See Restriction footnotes.	Long	IOPless	IOPless
5590	N/A	2780 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 574F)	See Restriction footnote.	Long	29	30
5591	N/A	2757 Disk Controller with a secondary, auxiliary write cache IOA. (CCIN 574F)	See Restriction footnotes.	Long	29	30

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
5700 5701	5700 5701	PCI-X 1 Gbps Ethernet	<p>If installing in the 5074 and 5079, place in the 32-bit position.</p> <p>Place in PCI-X slot if available (64-bit slot preferred.)</p> <p>A cross-over cable is not supported.</p> <p>The following restrictions do not apply if 5700/5701 is part of a CCIN 2892 IOP adapter group.</p> <ul style="list-style-type: none"> <li>• Can be combined with a maximum of one other IOA.</li> <li>• A maximum of two 4805, 5700, or 5701 in any combination per IOP.</li> <li>• Only TCP/IP supported.</li> <li>• Half Duplex (HDX) mode is not supported.</li> <li>• SNA is not supported.</li> </ul>	Short	2	26
5702	5702	PCI-X Ultra Tape Controller	See Restriction footnotes.	Short	29	21
5703	5703	PCI-X RAID Disk Unit Controller	<p>5703 not supported for driving internal DASD in the 520 POWER5+™</p> <p>See Restriction footnotes.</p>	Long	29	21
5704	5704	PCI-X Fibre Channel Tape Controller	<p>For best performance, place in a 64-bit position.</p> <p>A maximum of two 2765, 2766, 2787, or 5704, in any combination, per PCI bridge set boundary.</p>	Short	36	50
5705	5702	PCI Tape/Disk Unit Controller	5705 is not supported in the model 52x and 570 system units. This feature can be converted to a 5702.	Short	29	21
5709	5709	RAID Enabler Card	Supported on model 520 and 550. For installation instructions, see Backplanes and cards.	N/A	29	21
5712	5702	PCI-X Tape Controller	See Restriction footnote 1.	Short	29	21
5715	5702	PCI-X Tape/DASD Unit Controller	See Restriction footnotes.	Short	29	21
5721	573A	10 Gbps Ethernet IOA (short range)	For restrictions, see Table 29 on page 297.	Short	IOPless	IOPless
5722	576A	10 Gbps Ethernet IOA (long range)	For restrictions, see Table 29 on page 297.	Short	IOPless	IOPless
5726	5709	RAID Enabler Card	Supported on model 570. For installation instructions, see Backplanes and cards.	N/A	29	21

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
5727	573D	Integrated Cache – 40 MB	Supported on model 520 and 550. For installation instructions, see Backplanes and cards.	N/A	29	21
5728	573D	Integrated Cache – 40 MB	Supported on model 570. For installation instructions, see Backplanes and cards.	N/A	29	21
5736	571A	PCI-X Disk/Tape Controller	Maximum of 6 drives  See Restriction footnotes.	Short	29	21
5737	571B	PCI-X Disk Controller - 90MB	5737 not supported for driving internal DASD in slot 5 of the 520 POWER5+.  See Restriction footnotes.	Long	29	21
5738	571E	PCI-X Ultra320 SCSI Disk Controller	See Restriction footnotes.	Long	29	30
5739	571F	PCI-X Ultra320 SCSI Disk Controller with auxiliary write cache	<ul style="list-style-type: none"> <li>• Double-wide adapter, requires 2, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. (The controller side is the side with the external SCSI connectors.)</li> <li>• When used in an Logical Partition (LPAR) environment this double wide adapter must have both slots of the adapter assigned to the same logical partition. When doing Dynamic Logical Partitioning (DLPAR), both slots of the adapter must be managed together.</li> <li>• Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM).</li> <li>• See Restriction footnotes.</li> </ul>	Long, double-width	29	30

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
5760	280E	PCI-X Fibre Channel Disk Unit Controller	<p>For best performance, place in a 64-bit position.</p> <p>Only one per IOP and no other IOAs.</p> <p>A maximum of two 2765, 2766, 2787, 5704, 5758, 5760, or 5761 (any combination) per PCI bridge set boundary.</p> <p>This IOA can be used in Multipath configurations. To improve the availability provided by Multipath, it is recommended that each IOA and its IOP be placed on different HSL loops, in different expansion units or on different multi-adapter bridges.</p>	Short	N/A	N/A
5761	280D	PCI-X Fibre Channel Tape Controller	<p>Extra-high bandwidth.</p> <p>For best performance, place in a 64-bit position.</p> <p>A maximum of two 2765, 2766, 2787, 5704, 5708, or 5761 in any combination, per multi-adapter bridge boundary.</p> <p>For best performance, do not mix with other extra-high bandwidth adapters in the same multi-adapter bridge boundary.</p>	Short	36	50
5777	571E	PCI-X Ultra320 SCSI Disk Controller	See Restriction footnotes.	Long	IOPless	IOPless

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
5778	571F	PCI-X Ultra320 SCSI Disk Controller with auxiliary write cache	<ul style="list-style-type: none"> <li>• Double-wide adapter, requires 2, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. (The controller side is the side with the external SCSI connectors.)</li> <li>• When used in an Logical Partition (LPAR) environment this double wide adapter must have both slots of the adapter assigned to the same logical partition. When doing Dynamic Logical Partitioning (DLPAR), both slots of the adapter must be managed together.</li> <li>• Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM).</li> <li>• See Restriction footnotes.</li> </ul>	Long, double-width	IOPless	IOPless
5781	571F	PCI-X Ultra320 SCSI Disk Controller with auxiliary write cache	<ul style="list-style-type: none"> <li>• Double-wide adapter, requires 2, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. (The controller side is the side with the external SCSI connectors.)</li> <li>• When used in an Logical Partition (LPAR) environment this double wide adapter must have both slots of the adapter assigned to the same logical partition. When doing Dynamic Logical Partitioning (DLPAR), both slots of the adapter must be managed together.</li> <li>• Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM).</li> <li>• See Restriction footnotes.</li> </ul>	Long, double-width	29	30
5783	573B	iSCSI Host Bus Adapter (copper)	For information about this adapter see the iSCSI Host Bus Adapter topic.	Short	IOPless	IOPless

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
5784	573C	iSCSI Host Bus Adapter (fibre)	For information about this adapter see the iSCSI Host Bus Adapter topic.	Short	IOPless	IOPless
5799	571F	PCI-X Ultra320 SCSI Disk Controller with auxiliary write cache	<ul style="list-style-type: none"> <li>• Double-wide adapter, requires 2, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. (The controller side is the side with the external SCSI connectors.)</li> <li>• When used in an Logical Partition (LPAR) environment this double wide adapter must have both slots of the adapter assigned to the same logical partition. When doing Dynamic Logical Partitioning (DLPAR), both slots of the adapter must be managed together.</li> <li>• Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM).</li> <li>• See Restriction footnotes.</li> </ul>	Long, double-width	29	30
5904 5908	572F/ 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter	<ul style="list-style-type: none"> <li>• Double-wide adapter, requires 2, adjacent slots. The SAS controller side of the adapter (572F) pair requires a 64-bit slot. (The controller side is the side with the external SAS connectors.)</li> <li>• When used in an Logical Partition (LPAR) environment this double wide adapter must have both slots of the adapter assigned to the same logical partition. When doing Dynamic Logical Partitioning (DLPAR), both slots of the adapter must be managed together.</li> <li>• Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM).</li> <li>• See Restriction footnotes.</li> </ul>	Long, double-width	IOPless	IOPless



Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
6800 6801	5700 5701	PCI-X 1 Gbps Ethernet	<p>Not supported in the 5074 and 5079.</p> <p>Place in PCI-X slot if available (64-bit slot preferred).</p> <p>A cross-over cable is not supported.</p> <p>Only TCP/IP supported.</p> <p>Half Duplex (HDX) mode is not supported.</p> <p>SNA is not supported.</p> <p><b>Note:</b> Starting with V5R3M5 on model 520 (feature code 8325, 8327 or 8330) and V5R4M0 for the rest of the 5xx models, this is a dual mode adapter that is capable of functioning IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. See feature code 5700 and 5701 for this adapter when used with an IOP.</p>	Short	IOPless	IOPless
6803	2793	PCI 2-Line WAN with Modem	<p>Non-CIM (complex impedance matching)</p> <p><b>Note:</b> Starting with V5R3M5 on model 520 (feature code 8325, 8327 or 8330) and V5R4M0 for other 5xx models, this is a dual mode adapter that is capable of functioning IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter.</p>	Short	IOPless	IOPless

Table 16. Adapter numbers, descriptions, restrictions, memory values, and performance values (continued)

Feature number	CCIN	Description	Restrictions	Adapter length	Memory value	Performance value
6804	2793	PCI 2-Line WAN with Modem	CIM (complex impedance matching) <b>Note:</b> Starting with V5R3M5 on model 520 (feature code 8325, 8327 or 8330) and V5R4M0 for other 5xx models, this is a dual mode adapter that is capable of functioning IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter.	Short	IOPless	IOPless
9509	5709	RAID Enabler Card	Supported on model 9405-520.For installation instructions, see Backplanes and cards.	N/A	29	21
9510	573D	RAID Enabler Card	Supported on model 9405-520.For installation instructions, see Backplanes and cards.	N/A	29	21
9771	2771	PCI 2-Line WAN w/Modem	Only one per system.	Short	15	14
Installed	570B	Integrated Base SCSI Controller	If 5709 is installed then CCIN 570B is not used.	N/A	29	21
N/A	5708	Auxiliary Write Cache IOA	Integrated into feature codes 5580 and 5581. For more information, see those feature code descriptions in this table. See also Type 5708, auxiliary-write cache IOA (FC 5580, 5581) topic.	Long	29	1
N/A	574F	Auxiliary Write Cache IOA	Integrated into feature numbers 5582 and 5583. For more information, see those feature number descriptions in this table. See also Type 574F, auxiliary-write cache IOA (FC 5582, 5583) topic.	Long	29	1

#### Restriction footnotes for Table 16 on page 260

1. A maximum of three, 2757, 2780, 4748, 4778, 5580, 5581, 5582, 5583, 5590, 5591, 5736, 5703, 5736, 5738, 5739, 5737, 5781, 5799 allowed per IOP in any combination. Feature codes 5580, 5581, 5582, 5583, 5590, 5591, 5739, 5781, and 5799 contain two adapters. An auxiliary write cache IOA also counts as one IOA towards the maximum of three. For example, 5580 consists of 2 adapters so 5580 counts as two towards the three maximum when located under the same IOP.

For more information about auxiliary write cache IOA features, see the Planning for IBM eServer i5 Data Protection with Auxiliary Write Cache Solutions redbook. (REDP-4003-00)

2. For i5/OS a maximum of three 2757, 2780, 5580, 5581, 5582, 5583, 5738, 5739, 5778, and 5777 in any combination, allowed per tower 0574/5074, 0694/5094, 8294, 9194, (note: 5079, 5294 count as 2 enclosures), when used in a RAID configuration, otherwise four maximum.
3. A maximum of six , 0627/2780, 5580, 5590, 2757, 5581, 5591, 5582/5583, 5738/5777, and 5739/5778 allowed per 0694, 5094, 5294, 8093 (bottom unit), 8094 (both units), 8294 (both units), 9094 and 9194 unit enclosure regardless of operating system.  
For features that include a SCSI or SAS controller paired with an auxiliary write-cache IOA CCIN 574F, 575B, or 575C, the pair counts as only 1 adapter towards the maximum.  
For features that include a SCSI controller paired with an auxiliary write-cache IOA CCIN 5708, the pair Packet count as 2 adapters towards the 6 maximum.
4. For i5/OS, a maximum of three 5580/5590, 5581/5591, 5582 in any combination allowed per 0694, 5094, 5294, 8093 (bottom unit), 8094 (both units), 8294 (both units), 9094 and 9194 enclosure.  
Maximum of four 4748, 4778. 2757, 2780, 5738 in any combination allowed per 0694, 5094, 5294, 8093 (bottom unit), 8094 (both units), 8294 (both units), 9094 and 9194 enclosure.
5. The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.
6. For the 0574/5074 enclosures, a maximum of three 0605/4748/9748, 0606/4778/9778 2780/5580/5590, or 0618/2757/5581/5591, allowed per unit enclosure regardless of operating system. For features that include a SCSI or SAS controller paired with an auxiliary write-cache IOA CCIN 5708, 574F or CCIN 575B , the pair counts as only 1 adapter towards the 3 maximum.

## High-performance SCSI and SAS controller placement

Determine which PCI slots can accommodate the 0649, 2780, 5580, 5582, 5583, 5590, 5738, 5739, 5746, 5777, 5778, 5781, 5782, 5799, 5800, 5904, and 5908 controllers on IBM System i5 and eServer i5 models.

### Overview and prerequisites

This section provides special placement information for the SCSI and SAS controllers and auxiliary-write cache adapters listed in Table 17 on page 272. This information supplements the placement information in “Determine the best place to install your adapter” on page 255.

If you are installing a new feature, ensure that you have the software required to support the new feature and that you determine if there are any existing PTF prerequisites. To do this, use the IBM Prerequisite

Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf)  .

Use the list in Table 17 on page 272 to cross-reference adapter feature codes with their CCIN numbers and descriptions. See also the adapter tables in “Determine the best place to install your adapter” on page 255 for more detailed descriptions, notes, and restrictions for these adapters.

Then go to one of the following system or expansion unit tables to determine which PCI slots can accommodate these adapters.

- “5074 or 5079 expansion unit” on page 272
- “5094 or 5294 expansion unit” on page 273
- “5096 or 5296 expansion unit” on page 273
- “5088 or 0588 expansion unit” on page 274
- “5095 or 0595 expansion unit” on page 274
- “5790 expansion unit” on page 274
- “520 system unit with 1.5 and 1.6 GHz processors (CCIN numbers 28D2, 5228, 5229, and 522A)” on page 275
- “520 system unit with 1.9 GHz, POWER5+ processors (CCIN numbers 8325, 8327, 8330, 53C6, 53C2, and 53C3)” on page 275

- “550 system unit with 1.6 GHz processors (CCIN number 5237)” on page 276
- “550 system unit with 1.9 GHz, POWER5+ processors (CCIN number 8312, and 53C6)” on page 276
- “570 system unit with 1.6 GHz processors (CCIN numbers 26EA, and 26F2) ” on page 276
- “570 system unit with 2.2 GHz, POWER5+ processors (CCIN numbers 8338, and 53C9)” on page 276

**Attention:** Place these adapters only in an allowed slot. Placing these adapters in an unsupported slot may result in early-life, adapter failure.

*Table 17. High performance SCSI and SAS controllers.*

Feature codes	CCIN numbers	Description	Variables
0627	2780	PCI-X Ultra 4 RAID Disk Unit Controller	Direct attach
2780	2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled
5580, 5590	2780 and 574F	2780 Disk Controller with a secondary, auxiliary-write cache IOA	IOP controlled
0641	2780 and 574F	2780 Disk Controller with a secondary, auxiliary-write cache IOA	Direct attach
0649	571E	PCI-X Ultra320 SCSI Disk Controller	Direct attach
5738	571E	PCI-X Ultra320 SCSI Disk Controller	IOP controlled
5582	571E and 574F	5738 Disk Controller with a secondary, auxiliary-write cache IOA	IOP controlled
5777	571E	PCI-X Ultra320 SCSI Disk Controller	IOPless
5583	571E and 574F	5777 Disk Controller with a secondary, auxiliary-write cache IOA	IOPless
5739, 5746, 5781, 5799	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache  Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	IOP controlled
5778, 5782, 5800	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache  Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	IOPless
0650, 0651, 0654	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache  Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	Direct attach
5904 5908	572F and 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter  Double-wide adapter. 572F is the controller. 575C is the auxiliary-write cache.	IOPless

## 5074 or 5079 expansion unit

571E, and the double-wide 571F/575B and 572F/575C adapters are not supported on the 5074 or 5079.

2780 and 574F are supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled	2, 3, 4, 9, 10, 14, 15
		AIX or Linux controlled	2, 3, 4, 5, 9, 10, 11, 14, 15

CCIN number(s)	Description	Variables	Allowed slots
574F	Auxiliary-Write Cache IOA	IOP controlled	2, 3, 4, 9, 10, 14, 15
		IOPless or direct attach	1, 2, 3, 4, 5, 9, 10, 11, 14, 15

## 5094 or 5294 expansion unit

Adapters are supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled	2, 3, 4, 6, 7, 8, 9, 12, 13, 14, 15
		AIX or Linux controlled	2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15
574F	Auxiliary-Write Cache IOA	IOP controlled	2, 3, 4, 6, 7, 8, 9, 12, 13, 14, 15
		IOPless or direct attach	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15
571E	PCI-X Ultra320 SCSI Disk Controller	IOP controlled	3, 6, 7, 8, 9
		IOPless or direct attach	1, 3, 5, 6, 7, 8, 9
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	<b>2</b> , <u>3</u> , 4, 8, 9
		IOPless double-wide*	<b>1</b> , <u>2</u> , <u>3</u> , <u>4</u> , <b>5</b> , 6, 8, 9
572F and 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter	IOPless double-wide*	<b>14</b> , 15
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slots with <b>bold</b> numbers can be used for the SCSI controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

## 5096 or 5296 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5096 or 5296.

The double-wide 571F/575B and 572F/575C adapters are supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	<b>2</b> , <u>3</u> , 4, 8, 9
		IOPless double-wide*	<b>1</b> , <u>2</u> , <u>3</u> , <u>4</u> , <b>5</b> , 6, 8, 9
572F and 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter	IOPless double-wide*	<b>14</b> , 15
* Double-wide adapter, requires 2 adjacent slots. The controller side of the adapter pair requires a 64-bit slot. Slots with <b>bold</b> numbers can be used for the controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side of the adapter.			

## 5088 or 0588 expansion unit

The 2780, 574F, 571E, and 572F/575C adapters are not supported on the 5088 or 0588.

The double-wide 571F/575B is supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	8, 9
		IOPless double-wide*	8, 9

\* Double-wide adapter, requires 2 adjacent slots. Slots with **bold** numbers can be used for the controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side of the adapter.

## 5095 or 0595 expansion unit

The following adapters are supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	2, <u>3</u> , 4
		IOPless double-wide*	1, <u>2</u> , <u>3</u> , 4
572F and 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter	IOPless double-wide*	1, <u>2</u> , <u>3</u> , 4
571E	PCI-X Ultra320 SCSI Disk Controller	IOP controlled	2, 3, 4
	Maximum of one 571E	IOPless or direct attach	1, 2, 3, 4
2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled	2, 3, 4, 7, 8
		AIX or Linux controlled	1, 2, 3, 4, 6, 7, 8
574F	Auxiliary-Write Cache IOA	IOP controlled	2, 3, 4, 7, 8
		IOPless or direct attach	1, 2, 3, 4, 6, 7, 8

\* Double-wide adapter, requires 2 adjacent slots. Slots with **bold** numbers can be used for the controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side of the adapter.

## 5790 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5790.

The double-wide 571F/575B and 572F/575C adapters are supported in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	<b>2</b> , 3, <b>6</b> , 7
		IOPless double-wide*	1, <u>2</u> , 3 <b>5</b> , <u>6</u> , 7
572F and 575C	PCI-X DDR 1.5GB Cache SAS RAID Adapter	IOPless double-wide*	1, <u>2</u> , 3, <b>4</b> , <u>5</u> , 6 Maximum of 2 allowed.
* Double-wide adapter, requires 2 adjacent slots. The controller side of the adapter pair requires a 64-bit slot. Slots with <b>bold</b> numbers can be used for the controller side of the adapter. Slots where the number is <u>underlined</u> can be used for either side of the adapter. The remaining slot numbers can be used for the cache side of the adapter.			

### 520 system unit with 1.5 and 1.6 GHz processors (CCIN numbers 28D2, 5228, 5229, and 522A)

The 2780, 574F, 571E and 572F/575C adapters are not supported on the 1.5 and 1.6 GHz 520.

The double-wide 571F/575B adapter is supported on the 1.6 GHz 520 in the slots shown in the Allowed slots column.

The 520 version of the 571F/575B has special, thermal features that are designed specifically for the 520 system unit. Use only adapter, feature codes that are approved for the 520 when installing this adapter.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	4, 5
		IOPless double-wide	None. IOPless is not supported.

\* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot 5 can be used for the cache side (575B) of the adapter. IOPs must be in slots 1 or 2 and 6 or 3.

### 520 system unit with 1.9 GHz, POWER5+ processors (CCIN numbers 8325, 8327, 8330, 53C6, 53C2, and 53C3)

The 2780, 574F, 571E, and 572F/575C adapters are not supported on the 520.

The double-wide 571F/575B adapter is supported on the 1.9 GHz 520 in the slots shown in the Allowed slots column.

The 520 version of the 571F/575B has special, thermal features that are designed specifically for the 520 system unit. Use only adapter, feature codes that are approved for the 520 when installing this adapter.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide	None. IOP controlled is not supported.
		IOPless double-wide*	<b>4</b> , <u>5</u> , 6



CCIN number(s)	Description	Variables	Allowed slots
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot <u>5</u> can be used for either side of the adapter. Slot 6 can be used for the cache side (575B) of the adapter.			

### 550 system unit with 1.6 GHz processors (CCIN number 5237)

2780, 574F, 571E, 571F/575B, and 572F/575C adapters are not supported in the 1.6 GHz 550 system unit.

### 550 system unit with 1.9 GHz, POWER5+ processors (CCIN number 8312, and 53C6)

The 2780, 574F, 571E, and 572F/575C adapters are not supported in the 1.9 GHz 550 system unit.

The double-wide 571F/575B adapter is supported in the 1.9 GHz 550 system unit in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide	None. IOP controlled is not supported.
		IOPless double-wide*	<u>1</u> , <u>2</u> , <u>3</u> , 4

\* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slot 1 can be used for the SCSI controller side (571F) of the adapter. Slots 2 and 3 can be used for either side of the adapter. Slot 4 can be used for the cache side (575B) of the adapter.

### 570 system unit with 1.6 GHz processors (CCIN numbers 26EA, and 26F2)

The 2780, 574F, 571E, and 572F/575C adapters are not supported in the 1.6 GHz 570 system unit.

The double-wide 571F/575B is supported in the 1.6GHz 570 system unit in the slots shown in the Allowed slots column.

CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	4, 5
		IOPless double-wide	None. IOPless is not supported.

\* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot 5 can be used for the cache side (575B) of the adapter.

### 570 system unit with 2.2 GHz, POWER5+ processors (CCIN numbers 8338, and 53C9)

The 2780, 574F, 571E, and 572F/575C adapters are not supported in the 2.2 GHz 570 system unit.

The double-wide 571F/575B adapters is supported in the 2.2 GHz 570 system unit in the slots shown in the Allowed slots column.



CCIN number(s)	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	<b>4</b> , 5
		IOPless double-wide*	3, <u>4</u> , 5

\* Double-wide adapter, requires 2 adjacent slots. The controller side of the adapter pair requires a 64-bit slot. Slots with **bold** numbers can be used for the controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side of the adapter.

## Configuration tables for IBM System i5 and eServer i5 system units and expansion units

You can use the configuration tables in this section to help you determine where to install PCI adapters.

### Model 9407-515 (i5 515) system unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

For the model 515 system unit, the arrows in Figure 175 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set. The DDR slot (**C4**) only supports IOPless adapters. The DDR slot is best for extra high bandwidth, IOPless adapters as indicated in the tables in this section. However, the DDR slot is also backward compatible slower PCI adapters.

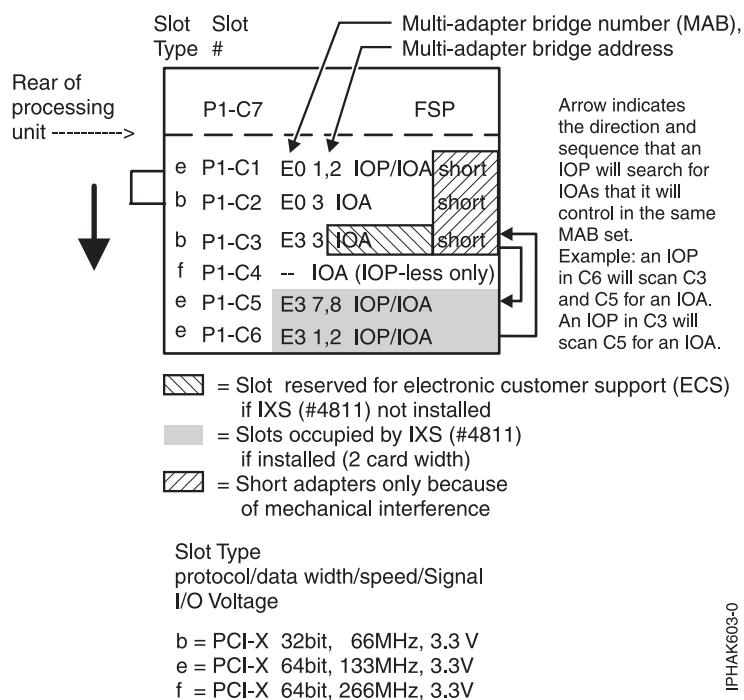


Figure 175. Model 515 IOP flow chart

The planar layout shown in Figure 175 is capable of supporting dual mode adapters. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C6 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E3 and multi-adapter bridge address 5, 6 (not shown in

diagram) and the IOP is at multi-adapter bridge number E3 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

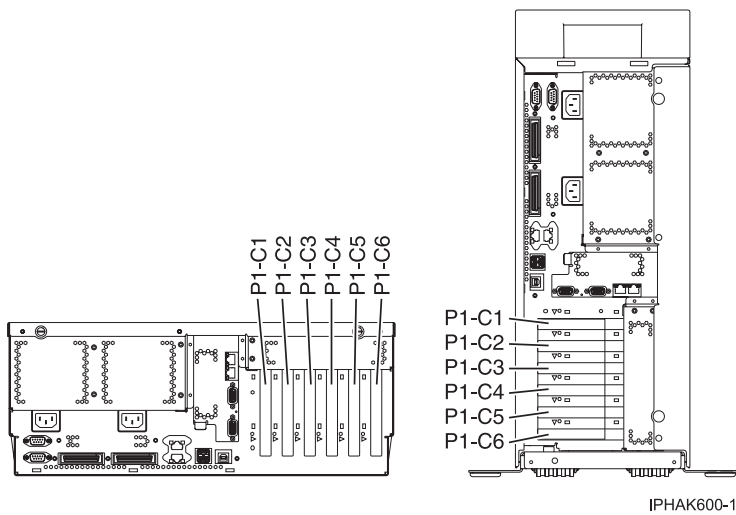


Figure 176. Model 515 rack mounted and desktside system unit back view with numbered slots.

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slots C1, C2, and C3 are short slots.
- Slots C4, C5, and C6 are long slots.

**Note:** When feature 6584 is installed, only short PCI cards can be plugged into PCI slot P1-C4. When feature 6594 is installed, only short PCI cards can be into PCI slot P1-C5.

- Short adapters can go in short or long slots.
- 32 or 64-bit adapters can go in 32-bit slots.
- 32 or 64-bit adapters can go in 64-bit slots.
- For best performance, 64-bit adapters should go in 64-bit slots.

Table 18. Slot location reference for the model 515

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	0	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	0	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	3	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	-	1	Un-P1-C4	Long, 64-bit 3.3V, 266 MHz, IOPless only
5	3	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	3	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

To identify compatible PCI adapters, see the “i5/OS PCI adapters table” on page 297,

**Model 9406-520 (i5 520) system unit:**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

. For the model 520 system unit, the arrows in Figure 177 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set.

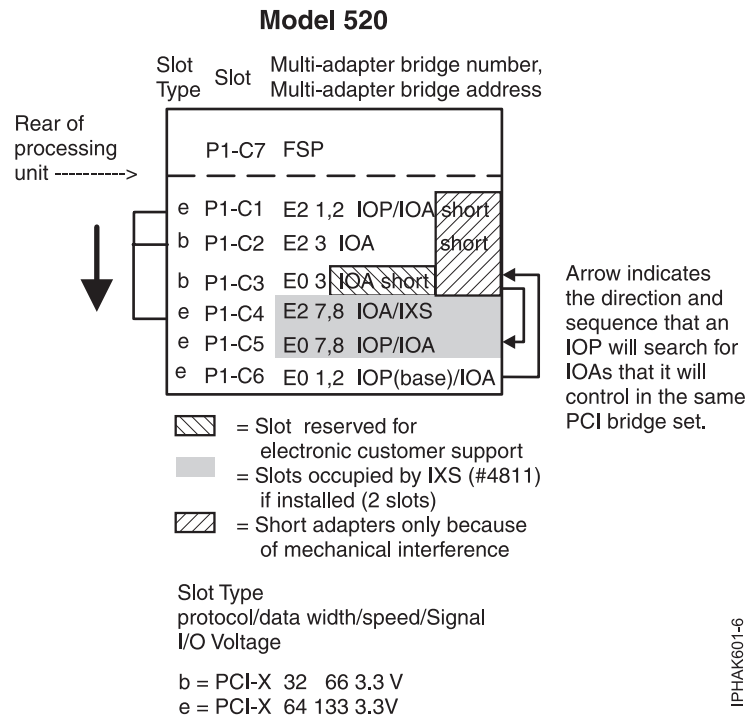


Figure 177. Model 520 IOP flow chart

For the model 520 with 1.9 GHz processor system unit, the arrows in Figure 178 on page 280 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set. If you have a system feature code of 8325, 8327 or 8330, refer to Figure 178 on page 280. These feature codes are for model 520 systems that have a double data rate (DDR) IOPless only slot (C4). The DDR slot only supports IOPless adapters. The DDR slot is best for extra high bandwidth, IOPless adapters as indicated in the tables in this section. However, the DDR slot is also backward compatible slower PCI adapters.

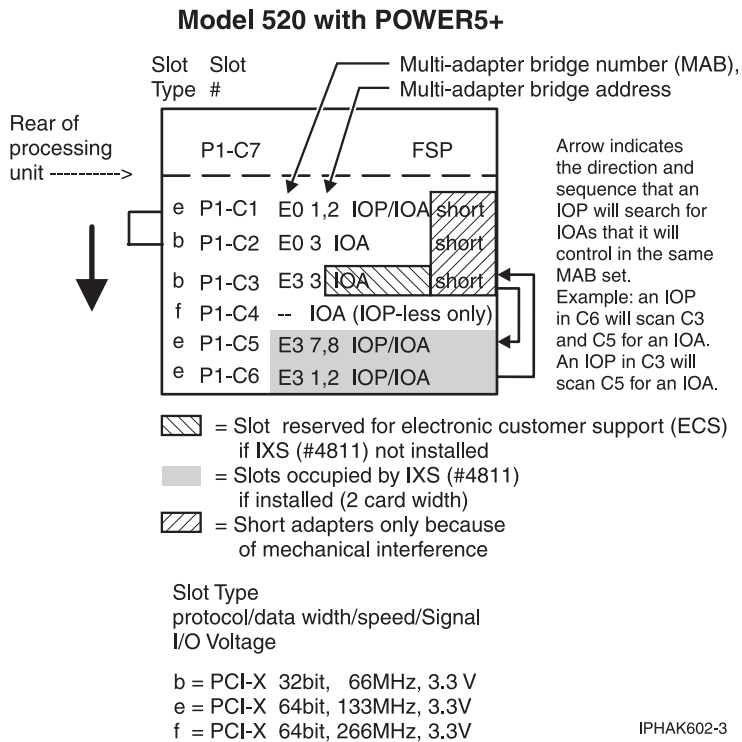


Figure 178. Model 520 with 1.9 GHz processor IOP flow chart

The planar layout shown in Figure 178 is capable of supporting dual mode adapters at V5R3M5 and later. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C6 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E3 and multi-adapter bridge address 5, 6 (not shown in diagram) and the IOP is at multi-adapter bridge number E3 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

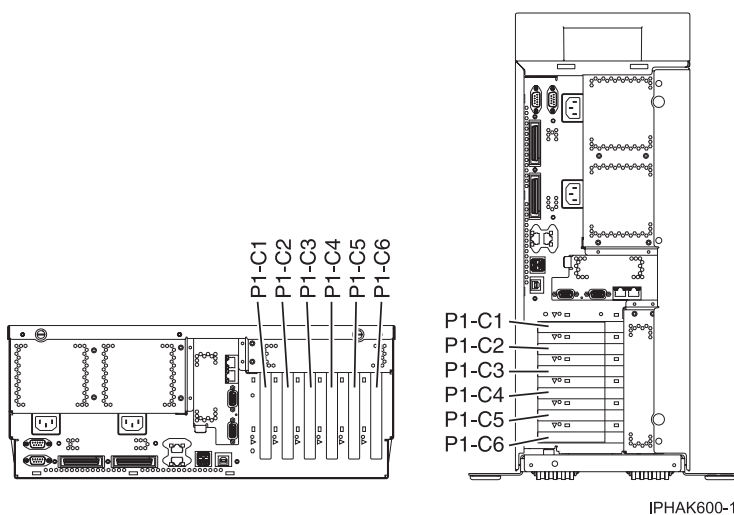


Figure 179. Model 520 rack mounted and desktide system unit back view with numbered slots.

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slots C1, C2, and C3 are short slots.
- Slots C4, C5, and C6 are long slots.

**Note:** When feature 6584 is installed, only short PCI cards can be plugged into PCI slot P1-C4. When feature 6594 is installed, only short PCI cards can be into PCI slot P1-C5.

- Short adapters can go in short or long slots.
- 32 or 64-bit adapters can go in 32-bit slots.
- 32 or 64-bit adapters can go in 64-bit slots.
- For best performance, 64-bit adapters should go in 64-bit slots.

*Table 19. Slot location reference for the model 520 with 1.5 or 1.6 GHz Processors*

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	2	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	2	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	0	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	2	1	Un-P1-C4	Long, 64-bit 3.3V, 133 MHz
5	0	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	0	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

*Table 20. Slot location reference for the model 520 with 1.9 GHz Processors*

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	0	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	0	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	3	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	-	1	Un-P1-C4	Long, 64-bit 3.3V, 266 MHz, IOPless only
5	3	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	3	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

To identify compatible PCI adapters, see the following tables:

- “AIX PCI adapters” on page 311
- “i5/OS PCI adapters table” on page 297
- “Linux PCI adapters” on page 307

**Model 9406-525 (i5 525) system unit:**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

For the model 525 system unit, the arrows in Figure 180 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set. The DDR slot (**C4**) only supports IOPless adapters. The DDR slot is best for extra high bandwidth, IOPless adapters as indicated in the tables in this section. However, the DDR slot is also backward compatible slower PCI adapters.

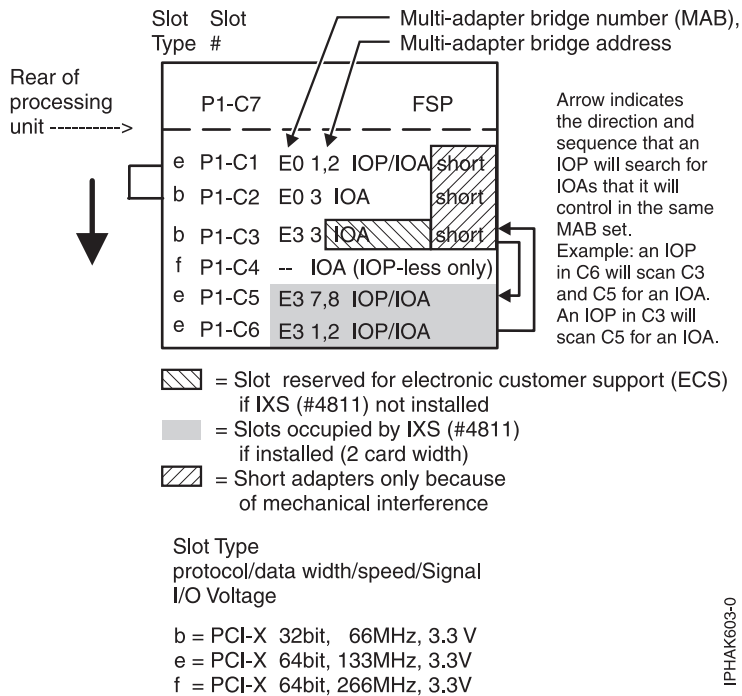


Figure 180. Model 525 IOP flow chart

The planar layout shown in Figure 180 is capable of supporting dual mode adapters. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C6 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E3 and multi-adapter bridge address 5, 6 (not shown in diagram) and the IOP is at multi-adapter bridge number E3 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

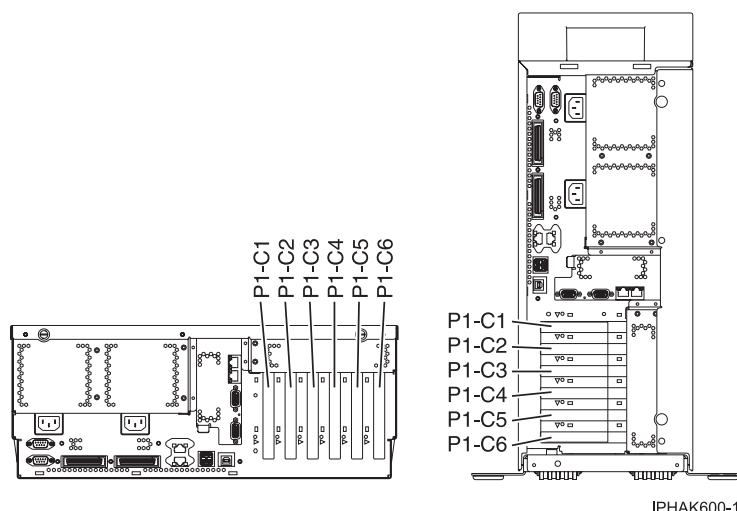


Figure 181. Model 525 rack mounted and desktside system unit back view with numbered slots.

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slots C1, C2, and C3 are short slots.
- Slots C4, C5, and C6 are long slots.

**Note:** When feature 6584 is installed, only short PCI cards can be plugged into PCI slot P1-C4. When feature 6594 is installed, only short PCI cards can be into PCI slot P1-C5.

- Short adapters can go in short or long slots.
- 32 or 64-bit adapters can go in 32-bit slots.
- 32 or 64-bit adapters can go in 64-bit slots.
- For best performance, 64-bit adapters should go in 64-bit slots.

Table 21. Slot location reference for the model 525

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	0	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	0	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	3	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	-	1	Un-P1-C4	Long, 64-bit 3.3V, 266 MHz, IOPless only
5	3	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	3	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

To identify compatible PCI adapters, see the “i5/OS PCI adapters table” on page 297.

#### Model 9406-520 (i5 520) system unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

. For the model 520 system unit, the arrows in Figure 177 on page 279 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set.

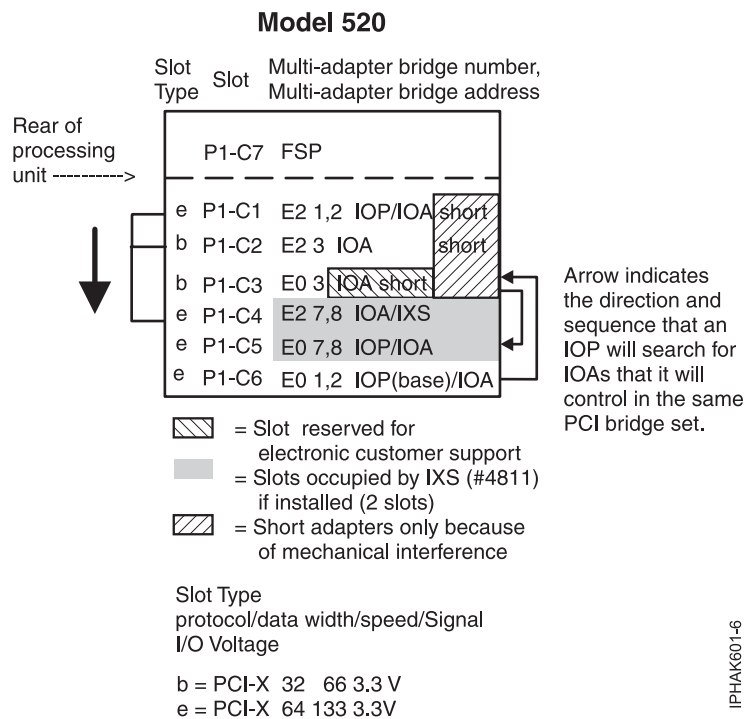


Figure 182. Model 520 IOP flow chart

For the model 520 with 1.9 GHz processor system unit, the arrows in Figure 178 on page 280 indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set. If you have a system feature code of 8325, 8327 or 8330, refer to Figure 178 on page 280. These feature codes are for model 520 systems that have a double data rate (DDR) IOPless only slot (C4). The DDR slot only supports IOPless adapters. The DDR slot is best for extra high bandwidth, IOPless adapters as indicated in the tables in this section. However, the DDR slot is also backward compatible slower PCI adapters.



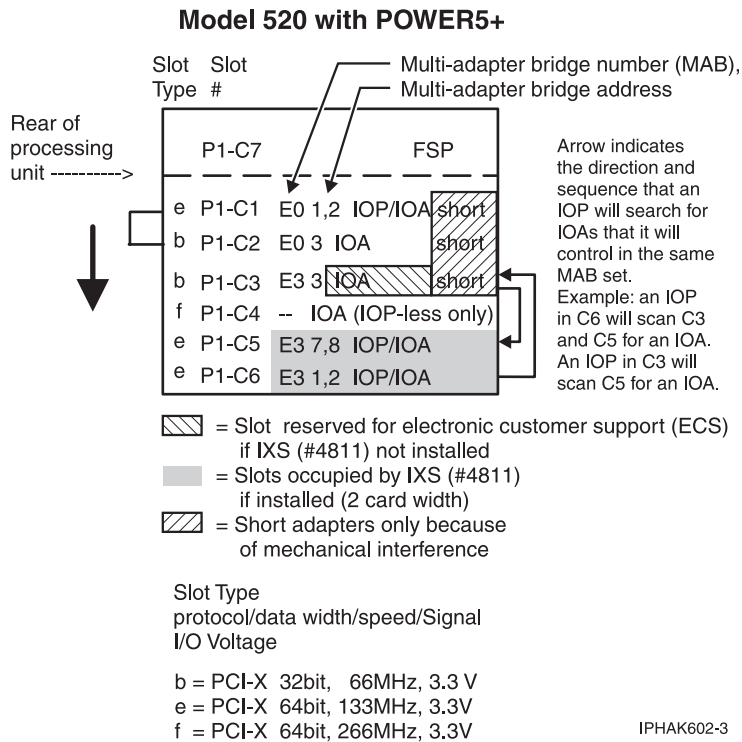


Figure 183. Model 520 with 1.9 GHz processor IOP flow chart

The planar layout shown in Figure 178 on page 280 is capable of supporting dual mode adapters at V5R3M5 and later. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C6 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E3 and multi-adapter bridge address 5, 6 (not show in diagram) and the IOP is at multi-adapter bridge number E3 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

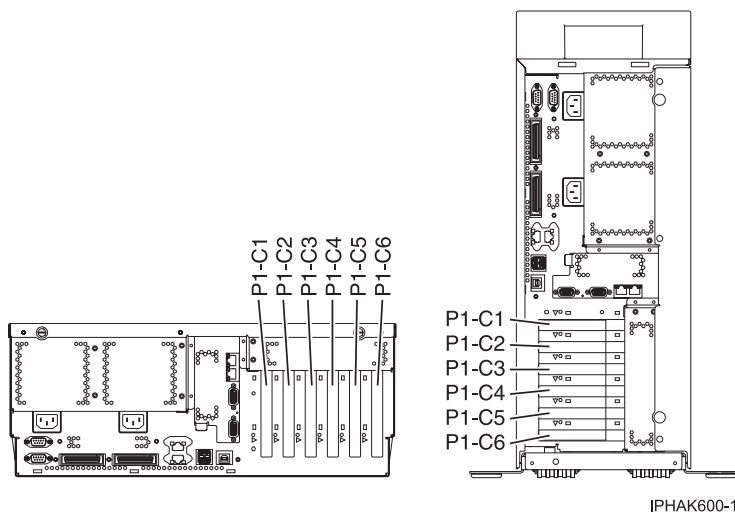


Figure 184. Model 520 rack mounted and desktide system unit back view with numbered slots.

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slots C1, C2, and C3 are short slots.
- Slots C4, C5, and C6 are long slots.

**Note:** When feature 6584 is installed, only short PCI cards can be plugged into PCI slot P1-C4. When feature 6594 is installed, only short PCI cards can be into PCI slot P1-C5.

- Short adapters can go in short or long slots.
- 32 or 64-bit adapters can go in 32-bit slots.
- 32 or 64-bit adapters can go in 64-bit slots.
- For best performance, 64-bit adapters should go in 64-bit slots.

*Table 22. Slot location reference for the model 520 with 1.5 or 1.6 GHz Processors*

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	2	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	2	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	0	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	2	1	Un-P1-C4	Long, 64-bit 3.3V, 133 MHz
5	0	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	0	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

*Table 23. Slot location reference for the model 520 with 1.9 GHz Processors*

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	0	1	Un-P1-C1	Short, 64-bit 3.3V, 133 MHz
2	0	1	Un-P1-C2	Short, 32-bit 3.3V, 66 MHz
3	3	1	Un-P1-C3	Short, 32-bit 3.3V, 66 MHz
4	-	1	Un-P1-C4	Long, 64-bit 3.3V, 266 MHz, IOPless only
5	3	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	3	1	Un-P1-C6	Long, 64-bit 3.3V, 133 MHz

To identify compatible PCI adapters, see the following tables:

- “AIX PCI adapters” on page 311
- “i5/OS PCI adapters table” on page 297
- “Linux PCI adapters” on page 307

**Model 9406-550 (i5 550) system unit:**

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

The arrows in the following figure indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set.

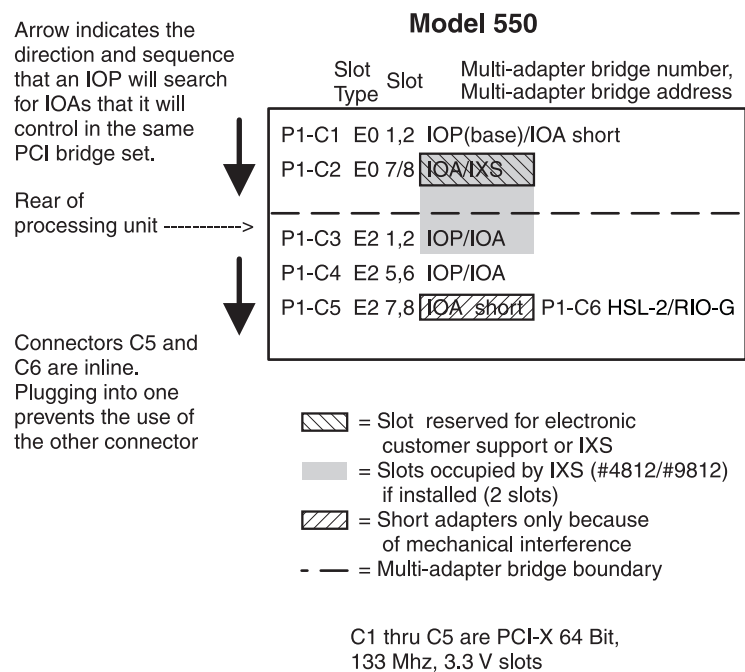


Figure 185. Model 550 IOP flow chart

Embedded SCSI is Multi-adapter bridge number E0 and address 5, 6

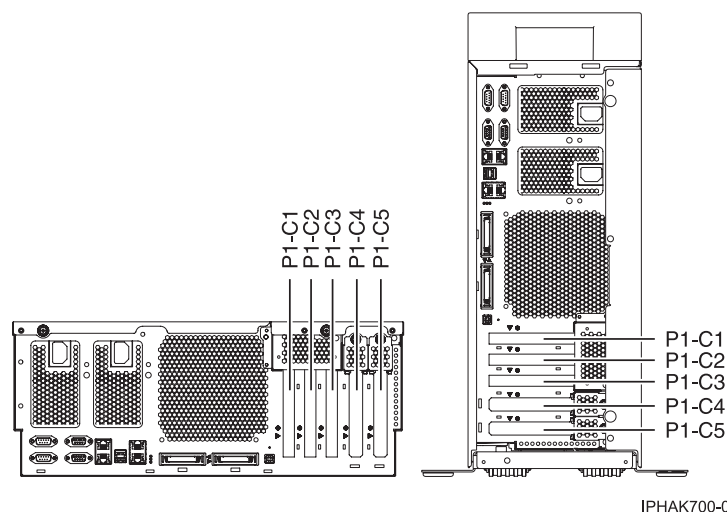


Figure 186. Model 550 rack mounted and deside system unit back view with numbered slots.

- Slots C1 through C5 are compatible with PCI and PCI-X adapters.
- Slots C1 through C4 are long slots.
- Slots C5 is a short slot.

- Slots C5 can contain one PCI, PCI-X, or GX+ adapter. If a GX+ adapter is installed, it must be placed in the C5 slot.
- Short adapters can go in short or long slots.
- A 32-bit or 64-bit adapter can go in a 64-bit slot.
- A 32-bit or 64-bit adapter can go in a 32-bit slot.
- For best performance 64-bit adapters should go in 64-bit slots.
- All slots support Enhanced Error Handling (EEH).
- If you are using the FC 5544 Operations Console, do not place FC 0614, 0613, 0615, 2742, 2793, 2794, 9793, 9794 in both slot C2 and C5.
- The model 550 with the 1.9 GHz processor does not come with a base IOP and is capable of supporting dual mode adapters at V5R4 and later. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C1 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E0 and multi-adapter bridge address 5, 6 (not shown in diagram) and the IOP is at multi-adapter bridge number E0 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

Table 24. Model 550 slot location reference

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	0	1	Un-P1-C1	Long, 64-bit 3.3V, 133 MHz
2	0	1	Un-P1-C2	Long, 64-bit 3.3V, 133 MHz
3	2	1	Un-P1-C3	Long, 64-bit 3.3V, 133 MHz
4	2	1	Un-P1-C4	Long, 64-bit 3.3V, 133 MHz
5	2	1	Un-P1-C5	Short, 64-bit 3.3V, 133 MHz

To identify compatible PCI adapters, see the following tables:

- “AIX PCI adapters” on page 311
- “i5/OS PCI adapters table” on page 297
- “Linux PCI adapters” on page 307

#### Model 9406-570 (i5 570) system unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

The arrows in the following figure indicate the direction and sequence that an IOP will search for IOAs that it will control in the same PCI bridge set.

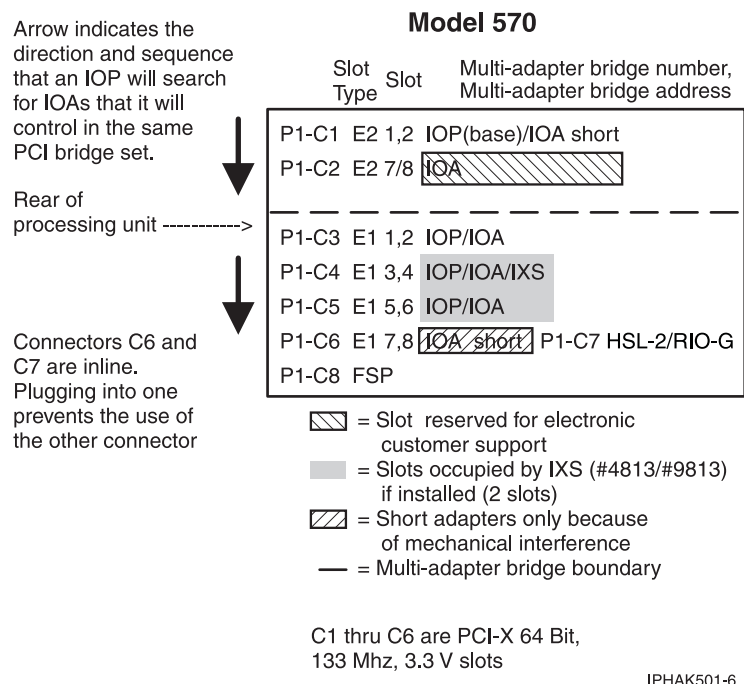


Figure 187. Model 570 IOP flow chart

Embedded SCSI is multi-adapter bridge number E2 and address 3,4. If feature code 5728 or 5726 is installed, then all 6 DASD are controlled by address 3,4. Without these features, address 3,4 controls only 3 DASD bays. The other 3 DASD bays are controlled by multi-adapter bridge number E0, address 1 (IOFless only).

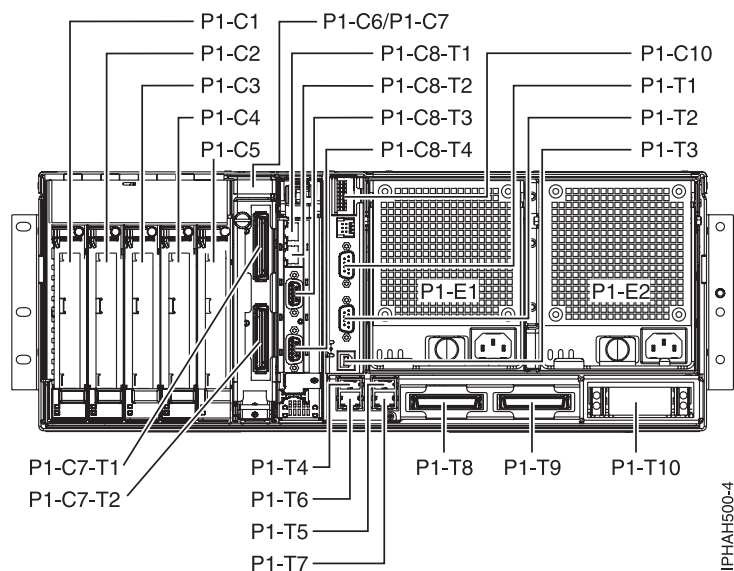


Figure 188. Model 570 rack mounted system unit back view with numbered slots.

- Slots C1 through C6 are compatible with PCI and PCI-X adapters.
- Slots C1, C2, C3, C4, and C5 are long slots.
- Slot C6 is a short slot. This space can be occupied by a PCI adapter or a high-speed link (HSL-2/RIO-G) card.

- Short adapters can go in short or long slots.
- A 32-bit or 64-bit adapter can go in a 64-bit slot.
- A 32-bit or 64-bit adapter can go in a 32-bit slot.
- For best performance, 64-bit adapters should go in 64-bit slots.
- If you are using the FC 5540 Twinax console, do not place FC 4746 or 9746 in both slot C4 and C6.
- The model 570 with the 1.9 GHz or faster processor does not come with a base IOP and is capable of supporting dual mode adapters at V5R4 and later. Dual mode adapters are adapters that can be either IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then this adapter will be under IOP control and will not function as an IOPless adapter. This also applies to the embedded SCSI controller. For example, if an IOP is placed in C1 then the embedded SCSI controller would be under IOP control since the embedded SCSI controller is at multi-adapter bridge number E2 and multi-adapter bridge address 3,4 (not shown in diagram) and the IOP is at multi-adapter bridge number E2 and multi-adapter bridge address 1, 2. Since the address of the IOP is lower on the embedded SCSI controller the IOP will control it.

Table 25. 570 slot location reference

Slot	PCI bridge set	Planar	Location code	Slot characteristics
1	2	1	Un-P1-C1	Long, 64-bit 3.3V, 133 MHz
2	2	1	Un-P1-C2	Long, 64-bit 3.3V, 133 MHz
3	1	1	Un-P1-C3	Long, 64-bit 3.3V, 133 MHz
4	1	1	Un-P1-C4	Long, 64-bit 3.3V, 133 MHz
5	1	1	Un-P1-C5	Long, 64-bit 3.3V, 133 MHz
6	1	1	Un-P1-C6	Short, 64-bit 3.3V, 133 MHz or HSL-2/RIO-G adapter placement

To identify compatible PCI adapters, see the following tables:

- “AIX PCI adapters” on page 311
- “i5/OS PCI adapters table” on page 297
- “Linux PCI adapters” on page 307

#### Model 9406-595 (i5 595) system unit:

PCI adapters connected to the model 595 system units are placed in expansion units. For information about PCI adapter placement for these systems, refer to the information for the model of expansion unit that is attached to the system.

#### 5074 expansion unit:

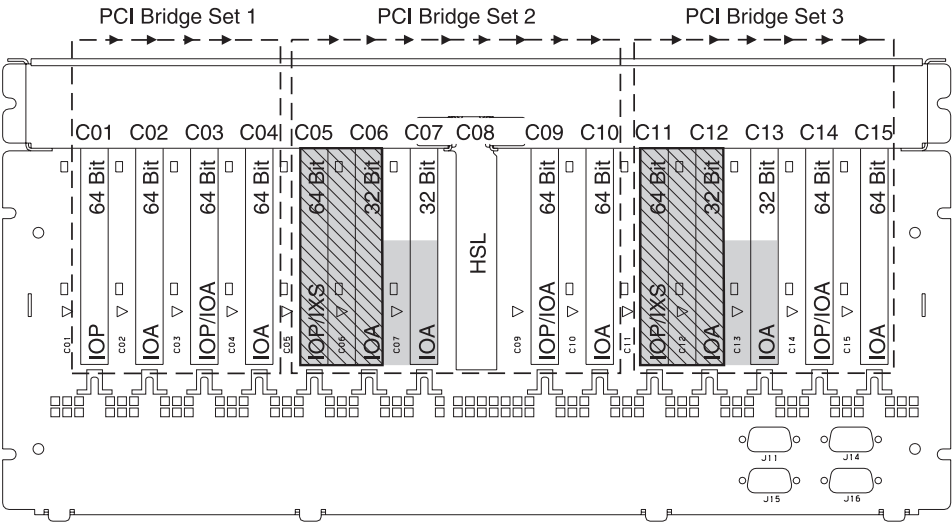
Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

- The first PCI bridge set has higher performance than the second and third PCI bridge sets. Place the highest bandwidth adapters in the first PCI bridge set.

- Place the first disk unit controller card in position C02, C03, or C04.
- Slots C06, C07, C12, and C13 are 5 Volt slots. Adapter cards must be 5 Volt compatible to go in these slots.
- Maximum of 3 IXS (CCIN 2890, 2892, 4812) per expansion unit.
- IOPs control IOAs in the direction of the arrows in the PCI bridge sets.

Resource name: \_\_\_\_\_



■ = positions occupied if 2890, 2891, or 2899 IXS is installed

▨ = positions occupied if 2892 or 4810 IXS is installed

Note: Long or short feature cards can go in any position.

Position	Type														
C01															
C02															
C03															
C04															
C05															
C06															
C07															
C08															
C09															
C10															
C11															
C12															
C13															
C14															
C15															

IPHAK800-0

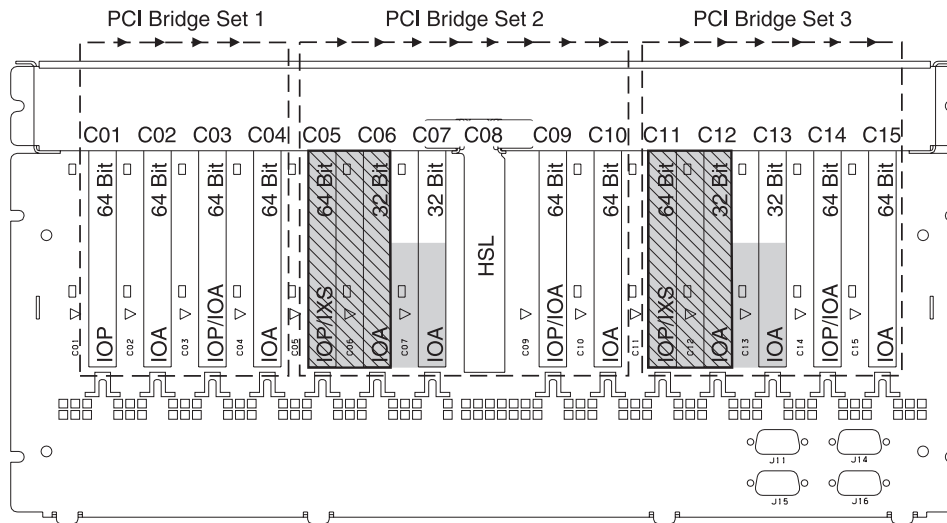
### 5079 expansion unit:

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

- The first PCI bridge set has higher performance then the second and third PCI bridge sets. Place the highest bandwidth adapters in the first PCI bridge set.
- Place the first disk unit controller card 2757, 2780, 4778 or 5703 in position C02, C03, or C04.
- Slots C06, C07, C12, and C13 are 5 Volt slots. Adapter cards must be 5 Volt compatible to go in these slots.
- Maximum of 3 IXS (CCIN 2890, 2892, 4812) per expansion unit.
- IOPs control IOAs in the direction of the arrows in the PCI bridge sets.

Resource name: \_\_\_\_\_



■ = positions occupied if 2890, 2891, or 2899 IXS is installed

▨ = positions occupied if 2892 or 4810 IXS is installed

Note: Long or short feature cards can go in any position.

Position	Type
C01	
C02	
C03	
C04	
C05	
C06	
C07	
C08	HSL
C09	
C10	
C11	
C12	
C13	
C14	
C15	

IPHAK800-0

### 5088 or 0588 expansion unit:

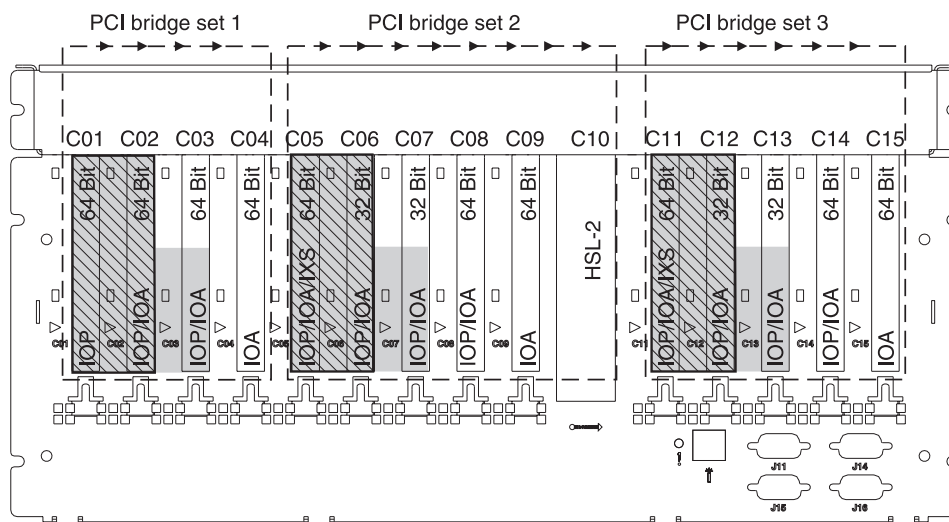
Some adapters must be placed in specific PCI-X slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

- The second PCI-X bridge set is designed for higher performance than the first and third PCI-X bridge sets. Place the highest bandwidth adapters in the second PCI-X bridge set.
- Features 2892 and 4810 are the only IXS cards allowed in C01.
- Maximum of 3 IXS (CCIN 2890, 2892, 4812) per expansion unit.
- IOPs control IOAs in the direction of the arrows in the PCI-X bridge sets.

**Resource name:** \_\_\_\_\_







■ = Positions occupied if 2890, 2891, or 2899 IXS is installed

▨ = Positions occupied if 2892 or 4810 IXS is installed

Note: Long or short feature cards can go in any position.

Position	Type													
C01														
C02														
C03														
C04														
C05														
C06														
C07														
C08														
C09														
C10														
C11														
C12														
C13														
C14														
C15														

IPHAK802-0

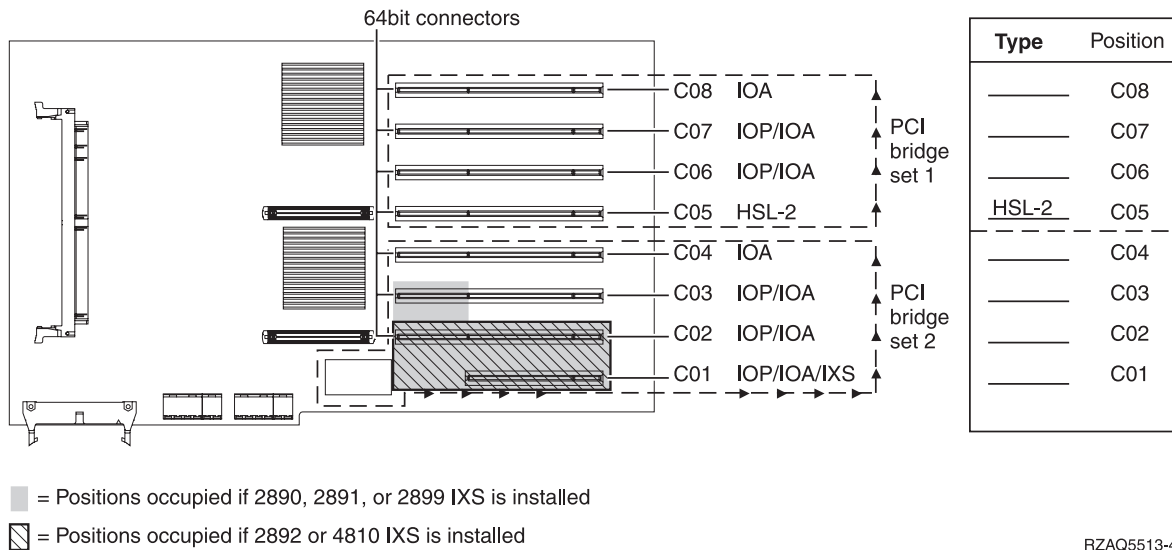
### 0595 or 5095 expansion unit:

Some adapters must be placed in specific PCI-X slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

- IOPs control IOAs in the direction of the arrows in the PCI-X bridge set.
- SCSI in the diagram indicates the disk unit controller position.

Resource name: \_\_\_\_\_



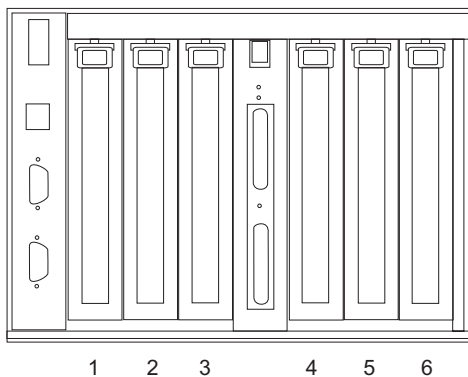
### 5790 expansion unit:

Some adapters must be placed in specific PCI-X slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

- IOPs control IOAs in the direction of slots 1 → 3, and 4 → 6.

Resource name: \_\_\_\_\_



- The following table shows the slot properties and PHB connections.

Table 26. Slot location descriptions

PHB1			PHB2		
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Long	Long	Long	Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2	Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6

- Slots C1 through C6 are compatible with PCI, PCI-X, and PCI-X DDR adapters. PCI-X DDR would operate at PCI-X speeds.
- Short adapters can go in short or long slots.

## Examples of placement tables

You might need to create a worksheet documenting your systems current PCI adapter placements. Use the tables in this section as examples.

If your unit is shut down, look at the back of the unit and record the numbers on the adapters in the applicable table below. Use the "Configuration tables for IBM System i5 and eServer i5 system units and expansion units" on page 277 to locate the embedded IOPs.

Use one worksheet for each IOP in all of your units.

Table 27. 2843 IOP

IOP adapter group	Adapter position	Feature number or CCIN number from type column	Memory value	Performance value
	C	2843	211	100
	C			
	C			
	C			
	C			
	IOA totals			

Table 28. 2844 IOP

IOP adapter group	Adapter position	Feature number or CCIN number from type column	Memory value	Performance value
	C	2844	211	100
	C			
	C			
	C			
	C			
	IOA totals			

### 289x or 4810 integrated xSeries server IOP

**CCIN 2890 (feature codes 2743, 2760, 2790, 2791, 2799, 2890, 2891, 2899, and 4838) restrictions:**

- Add only 2744, 2743, 2760, 4838 IOAs.
- The 2890 adapter uses three positions (if an IOA is used).
- Memory and performance values have no maximum limits.

**CCIN 2892 (feature codes 2792, 2892, 4710, and 4810) restrictions:**

- Add only 2744, 5700, and 5701 IOAs.
- Two positions are used.
- Memory and performance values have no maximum limits.

This IOP is not allowed in model 52x, 550, and 570 processing units.

IOP adapter group	Adapter position	Feature number or CCIN number from adapter position
	C	289x IXS
	C	
	C	

IOP adapter group	Adapter position	Feature number or CCIN number from adapter position
	C	289x IXS
	C	

IOP adapter group	Adapter position	Feature number or CCIN number from type column	Memory value	Performance value
IOP	C01	2843	211	100
IOA	C02	2748	30	21
IOA	C03	4745	15	7
IOA	C04	4746	10	6
IOA	C05		26	37
	<b>IOA totals</b>		81	71

## i5/OS PCI adapters table

Learn about which PCI adapters are supported on IBM System i5 and eServer i5 running the i5/OS operating system.

Adapters can be serviced with the system power on (hot-pluggable) unless noted that they must be serviced with the system power off (not hot-pluggable).

Starting with V5R3M5 on model 520 (1.9 GHz feature code 8325, 8327 or 8330), and V5R4M0 for the 5xx models with 1.9/2.2 GHz processors, there are changes in which new and existing adapters can function in a dual mode. Dual mode adapters are capable of functioning IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then dual mode adapters will be under IOP control and will not function as an IOPless adapter. See "Other information" column in table below for those adapters that are dual mode capable.

System type 9411-100, or 100, indicates that the feature can be used in an i5 expansion unit attached to a IBM System p5 or eServer p5 system that is running an i5/OS partition.

Table 29. i5/OS PCI adapters table

Feature/ CCIN	Systems/ Expansion Units						Description	Adapter characteristics	Other information
	515	520 525	550	570	595	100			
2742/2742	X	X	X	X	X	X	PCI Two-Line WAN IOA	Short, 32-bit, 66MHz	
2743/2743		X	X	X	X	X	PCI 1 Gbps Ethernet IOA	Short, 64-bit, 66MHz	High bandwidth
2744/2744		X	X	X	X	X	PCI 4/16/100 Mbps Token-Ring IOA	Short, 32-bit, 33MHz	
2749/2749		X	X	X	X	X	PCI Ultra Magnetic Media Controller	Short, 32-bit, 33MHz	This adapter might encounter performance limitations in PCI-X towers and systems.

Table 29. i5/OS PCI adapters table (continued)

2757/2757		X	X	X	X	X	PCI Ultra RAID Disk Controller	Long, 64-bit,	<ul style="list-style-type: none"> <li>High bandwidth</li> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> </ul>
2760/2760		X	X	X	X	X	PCI 1 Gbps Ethernet UTP IOA	Short, 64-bit, 66MHz	High bandwidth
2765/2765		X	X	X	X	X	PCI 2 Gb Fibre Channel Tape Controller	Short, 64-bit, 66MHz	High bandwidth
2763/2763		X	X	X	X	X	PCI RAID Disk Unit Controller	Long, 32-bit, 33 Mhz	
2766/2766		X	X	X	X	X	PCI Fibre Channel Disk Unit Controller	Short, 64-bit, 66MHz	High bandwidth
2772/2772		X	X	X	X	X	PCI Dual WAN/Modem IOA	Short, 32-bit, 33MHz	
2773/2772		X	X	X	X	X	PCI Dual WAN/Modem IOA (ANSI)	Short, 32-bit, 33MHz	
2780/2780		X	X	X	X	X	PCI-X Ultra4 RAID Disk Ctrl	Long, 64-Bit, 133 MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> </ul>
2782/2782		X	X	X	X	X	PCI-X RAID Disk Unit Controller	Long, 64bit, 133MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
2787/2787		X	X	X	X	X	PCI-X Fibre Channel Disk Unit Controller	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
2793/2793	X	X	X	X	X	X	PCI 2-Line WAN with Modem	Short, 32-bit, 66MHz	
2794/2793	X	X	X	X	X	X	PCI 2-Line WAN with Modem (complex impedance matching)	Short, 32-bit, 66MHz	
2805/2805	X	X	X	X	X	X	PCI Quad Modem IOA	Long, 32-bit, 66MHz	
2806/2805	X	X	X	X	X	X	PCI Quad Modem IOA (complex impedance matching)	Long, 32-bit, 66MHz	
2843/2843		X	X	X	X	X	PCI Node Input/Output Processor (IOP)	Short, 32-bit, 66MHz	
2844/2844	X	X	X	X	X	X	PCI Node Input/Output Processor (IOP)	Short, 64-bit, 66MHz	
2847/2847		X	X	X	X	X	SAN Boot IOP	Short, 64 bit , 66 Mhz	
2849/2849		X	X	X	X	X	PCI 100/10 Mbps Ethernet IOA	Short, 32-bit, 33MHz	
2890/2890		X	X	X	X	X	PCI Integrated Netfinity® Server	Long, 64 bit, 66 MHz, Double wide	Requires special IXS slot
2891/2891		X	X	X	X	X	PCI Integrated xSeries Server	Long, 64 bit, 66 MHz, Double wide	Requires special IXS slot

Table 29. i5/OS PCI adapters table (continued)

2892/2892		X	X	X	X	X	PCI Integrated xSeries Server	Long, 64 bit, 66 MHz, Double wide	Requires special IXS slot
2899/2899		X	X	X	X	X	PCI Integrated xSeries Server	Long, 64 bit, 66 MHz, Double wide	Requires special IXS slot
2947/		X	X	X	X	X	PCI Multiprotocol Adapter	Long, 32-bit, 3.3 or 5V	
4723/2723		X	X	X	X	X	PCI 10 Mbps Ethernet IOA	Short, 32-bit, 33MHz	
4745/2745		X	X	X	X	X	PCI Two-Line WAN IOA	Short, 32-bit, 33MHz	
4746/2746 9746/2746	X	X	X	X	X	X	PCI Twinaxial Workstation Controller IOA	Short, 32-bit, 33MHz	
4748/2748		X	X	X	X	X	PCI RAID Disk Unit Controller	Long, 32 bit, 33 MHz	
4778/2778		X	X	X	X	X	PCI RAID Disk Unit Controller	Long, 32 bit, 33 MHz	
4801/4758		X	X	X	X	X	PCI Cryptographic Coprocessor	Short, 32-bit, 33MHz	
4805/2058		X	X	X	X	X	PCI Cryptographic Accelerator	Short, 32-bit, 33MHz	
4806/4764		X	X	X	X	X	PCI-X Cryptographic Coprocessor • This feature contains a battery. <b>CAUTION:</b> <b>Only trained service personnel should replace this battery. The battery contains lithium. To avoid possible explosion, do not burn or charge the battery. Do not:</b> – Throw or immerse into water – Heat to more than 100°C (212°F) – Repair or disassemble. <b>Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C002)</b>	Short, 64-bit, 133 MHz, 3.3 V	<ul style="list-style-type: none"> <li>9-pin D-shell connector is not for customer use.</li> <li>This feature meets the Class B, electromagnetic compatibility requirements.</li> <li>This feature might be shipped with environmental warning labels. If labels regarding the mercury content of this feature are present, they must be applied to the system unit in which this feature is placed. Apply the labels in a conspicuous location as near as possible to the product information labels ( UL, FCC, CE) at the back of the system unit.</li> </ul>
4810/2892		X	X	X	X	X	PCI Integ xSeries Server	Long, special IXS slot required, double-width	Four memory slots, must be populated in identical pairs
4838/2838		X	X	X	X	X	PCI 100/10 Mbps Ethernet IOA	Short, 32-bit, 33MHz	

Table 29. i5/OS PCI adapters table (continued)

5580/5708		X	X	X	X	X	2780 Controller with 5708 Auxiliary Write Cache	Long, 133 MHz, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Two adapter set, requires two open slots within the same enclosure.</li> <li>The 2757 and 2780 controllers are high bandwidth</li> <li>5708 Auxiliary Write Cache is low bandwidth.</li> <li>If possible, place the 2757 or 2780 controller in a 64 bit/133 MHz slot for best performance.</li> </ul>
5581/5708		X	X	X	X	X	2757 Controller with 5708 Auxiliary Write Cache	Long, 133 MHz, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>For more information about this feature, see Type 5708, auxiliary-write cache IOA (FC 5580, 5581).</li> </ul>
5582/571E		X	X	X	X	X	5738 Controller with 574F Auxiliary Write Cache IOA	Long, 133 MHz, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Two adapter set, requires two open slots within the same enclosure.</li> <li>The 5738 or 5777 controller is extra-high bandwidth</li> <li>574F Auxiliary Write Cache is low bandwidth.</li> <li>If possible, place 5738/5777 in 64 bit/133 MHz slot for best performance.</li> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> <li>For specifications and installation notes for this feature, see theType 574F, auxiliary-write cache IOA (FC 5582, 5583) Web page.</li> </ul>
5583/571E		X	X	X	X	X	5738 Controller with 574F Auxiliary Write Cache IOA	Long, 133 MHz, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Two adapter set, requires two open slots within the same enclosure.</li> <li>The 5738 or 5777 controller is extra-high bandwidth</li> <li>574F Auxiliary Write Cache is low bandwidth.</li> <li>If possible, place 5738/5777 in 64 bit/133 MHz slot for best performance.</li> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> <li>For specifications and installation notes for this feature, see theType 574F, auxiliary-write cache IOA (FC 5582, 5583) Web page.</li> </ul>



Table 29. i5/OS PCI adapters table (continued)

5590/2780		X	X	X	X	X	2780 Controller with 574F Auxiliary Write Cache IOA	Long, 133 MHz, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Two adapter set, requires two open slots within the same enclosure.</li> <li>The 2780 and 2757 controllers are high bandwidth</li> <li>The Auxiliary Write Cache is low bandwidth.</li> <li>Place the controller in a 64 bit/133 MHz slot for best performance.</li> <li>The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>For more information about this feature, see theType 574F, auxiliary-write cache IOA (FC 5582, 5583) Web page.</li> </ul>
5591/2757		X	X	X	X	X	2757 Controller with 574F Auxiliary Write Cache IOA	Long, 133 MHz, 32 or 64-bit, 3.3V	
5700/5700	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>Only TCP/IP supported</li> <li>High bandwidth</li> <li>If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> </ul>
5701/5701	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet UTP IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>Only TCP/IP supported</li> <li>High bandwidth</li> <li>If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> </ul>
5702/5702		X	X	X	X	X	PCI-X Ultra Tape Controller	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
5703/5703		X	X	X	X	X	PCI-X RAID Disk Unit Ctlr	Long, 32 or 64-bit, 3.3V	
5704/5704		X	X	X	X	X	PCI-X Fibre Channel Tape Controller	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
5706/5706	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet UTP 2-port IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>Only TCP/IP supported</li> <li>High bandwidth</li> <li>If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot"</li> </ul>
5707/5707	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet SX Fiber 2-port IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>Only TCP/IP supported</li> <li>High bandwidth</li> <li>If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> </ul>
5712/5702		X	X	X	X	X	PCI-X U320 Tape Controller	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>

Table 29. i5/OS PCI adapters table (continued)

5715/5702		X	X	X	X	X	PCI-X U320 Tape/Disk Unit Controller	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>High bandwidth</li> </ul>
5721/573A	X	X	X	X	X	X	10 Gbps Ethernet (short reach)	Short, 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Extra-high bandwidth</li> <li>None allowed in PCI slot (PCI-X is acceptable)</li> <li>None allowed in 32 bit slot</li> <li>Maximum of 2 adapters per PHB</li> <li>For best performance, do not combine other extra-high or high bandwidth adapters in the same PHB.</li> <li>Place in slots 5-9 when the adapter is used in one of these expansion units: 5094, 5294, 0588, 5088, 0694, 8294, or 9194.</li> </ul>
5722/576A	X	X	X	X	X	X	10 Gbps Ethernet (long reach)	Short, 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Recommended in DDR slot</li> <li>Maximum of 6 per RIO HSL-2 loop</li> <li>Maximum of 3 per HSL loop.</li> <li>Maximum or near maximum quantity of adapters assumes some adapters are for backup or are running at reduced capacity</li> <li>If an AIX or Linux partition is used in the same PHB, then 5718 or 5719 are not supported with the 5721/5722.</li> </ul>
5727/573D	X	X	X				Integrated Cache - 40 MB	N/A	Dual-mode adapter
5728/573D				X			Integrated Cache - 40 MB	N/A	Dual-mode adapter
5736/571A	X	X	X	X	X	X	PCI-X Disk/Tape Ctlr	Short, 64 bit, 266 MHz	<ul style="list-style-type: none"> <li>High bandwidth if used with tape drives, extra-high bandwidth if used with disk drives.</li> <li>For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> <li>Also supported on models 270, 800, 810, 820, 825, 830, 840, 870, and 890.</li> </ul>

Table 29. i5/OS PCI adapters table (continued)

5737/571B		X	X	X	X	X	PCI-X Disk Controller - 90MB	Long, 64 bit, 266 MHz	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> <li>• Also supported on models 270, 800, 810, 820, 825, 830, 840, 870, and 890.</li> </ul>
5738/571E		X	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Raid Adapter	Long, 32 or 64-bit, 3.3V, 133 MHz	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> </ul>
5739/571F 5781/571F 5799/571F		X	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide)	Long, 64-bit, 3.3V, 266 MHz	<ul style="list-style-type: none"> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> </ul>
5760/280E		X	X	X	X	X	PCI-X Fibre channel Disk Controller	Short, 64-bit, 3.3V, 133 MHz	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> </ul>
5761/280D		X	X	X	X	X	PCI-X Fibre channel Disk Controller	Short, 64-bit, 3.3V, 133 MHz	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> </ul>
5775/571A	X	X	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>• EEH Supported</li> <li>• High Bandwidth</li> <li>• Maximum of 6 disk drives</li> </ul>

Table 29. i5/OS PCI adapters table (continued)

5776/571B	X	X	X	X	X	X	PCI-X Disk Controller - 90MB	Long, 64 bit, 266 MHz	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> <li>• Dual-mode capable adapter</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> <li>• Also supported on models 270, 800, 810, 820, 825, 830, 840, 870, and 890.</li> </ul>
5777/571E		X	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Raid Adapter	Long, 32 or 64-bit, 3.3V, 133 MHz	<ul style="list-style-type: none"> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> </ul>
5778/571F 5782/571F 5800/571F		X	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide)	Long, 64-bit, 3.3V, 266 MHz	<ul style="list-style-type: none"> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• IOPless</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and "High-performance SCSI and SAS controller placement" on page 271.</li> </ul>
5783/573B	X	X	X	X	X	X	iSCSI Host Bus Adapter (copper)	Short, 64-bit, 3.3V	<ul style="list-style-type: none"> <li>• High bandwidth</li> <li>• A nonpartitioned i5/OS system needs to have one Ethernet port for a system with 5783 or 5784.</li> <li>• A partitioned system needs to have one Ethernet port per i5/OS partition that contains a 5783 or 5784.</li> <li>• For additional information about this adapter see the iSCSI Host Bus Adapter topic.</li> </ul>
5784/573C	X	X	X	X	X	X	iSCSI Host Bus Adapter (fibre)	Short, 64-bit, 3.3V	

Table 29. i5/OS PCI adapters table (continued)

5904/572F 5908/572F		X	X	X	X		PCI-X DDR 1.5GB Cache SAS RAID Adapter	Long, 64-bit, 3.3V, 266 MHz	<ul style="list-style-type: none"> <li>• Double-wide adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• IOPless</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and “High-performance SCSI and SAS controller placement” on page 271.</li> </ul>
6800/5700	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>• Only TCP/IP supported</li> <li>• High bandwidth</li> <li>• Dual-mode adapter</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> </ul>
6801/5701	X	X	X	X	X	X	PCI-X 1 Gbps Ethernet UTP IOA	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>• Only TCP/IP supported</li> <li>• High bandwidth</li> <li>• Dual-mode adapter</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260.</li> </ul>
6803/2793	X	X	X	X	X	X	PCI 2-Line WAN with Modem	Short, 32-bit, 66MHz	<ul style="list-style-type: none"> <li>• Dual-mode adapter</li> <li>• Limited protocol support. In IOPless mode only PPP for ECS is supported on the modem. An RVX port is not supported.</li> </ul>
6804/2793	X	X	X	X	X	X	PCI 2-Line WAN with Modem (complex impedance matching)	Short, 32-bit, 66MHz	<ul style="list-style-type: none"> <li>• Dual-mode adapter</li> <li>• Limited protocol support. In IOPless mode only PPP for ECS is supported on the modem. An RVX port is not supported.</li> </ul>
6805/2742	X	X	X	X	X	X	PCI 2-Line WAN IOA IOPless	Short, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>• Dual mode adapter</li> <li>• Requires V5R4M5 or later.</li> </ul>
6808/2805	X	X	X	X	X	X	PCI 4-Modem WAN IOA IOPless	Long, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>• Dual mode adapter</li> <li>• Requires V5R4M5 or later.</li> </ul>
6809/2805	X	X	X	X	X	X	PCI 4-Modm WAN IOA IOPless CIM	Long, 32-bit, 66 MHz, 3.3V	<ul style="list-style-type: none"> <li>• Dual mode adapter</li> <li>• Requires V5R4M5 or later.</li> </ul>

Table 29. i5/OS PCI adapters table (continued)

6833/2793	X	X	X	X	X	X	PCI 2-Line WAN w/Modem IOPless	Short, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>Dual mode adapter</li> <li>Requires V5R4M5 or later.</li> </ul>
6834/2793	X	X	X	X	X	X	PCI 2-Line WAN w/Modem IOPless CIM	Short, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>Dual mode adapter</li> <li>Requires V5R4M5 or later.</li> </ul>
9493/2793	X	X	X	X	X	X	Base PCI 2-Line WAN w/Modem	Short, 32-bit, 66MHz	<ul style="list-style-type: none"> <li>Dual-mode adapter</li> <li>Limited protocol support. In IOPless mode only PPP for ECS is supported on the modem. An RVX port is not supported.</li> </ul>
9494/2793	X	X	X	X	X	X	Base PCI 2-Line WAN w/Modem	Short, 32-bit, 66MHz	<ul style="list-style-type: none"> <li>Dual-mode adapter</li> <li>Limited protocol support. In IOPless mode only PPP for ECS is supported on the modem. An RVX port is not supported.</li> </ul>
9510/573D	X	X					Integrated Cache - 40 MB	N/A	Dual-mode adapter
9710/2892			X	X			Base PCI Integ xSeries Srvr	Long, special IXS slot required, two slots used	
9744/2844		X	X	X	X	X	PCI Node Input/Output Processor (IOP)	Short, 64-bit, 66MHz	
9844/2844	X	X	X	X	X	X	PCI Node Input/Output Processor (IOP)	Short, 64-bit, 66MHz	
9771/2771		X	X	X	X	X	PCI 2-Line WAN with Modem	Short, 64-bit, 133MHz	
9793/2793	X	X	X	X	X	X	Base PCI 2-Line WAN w/Modem	Short, 32-bit, 66MHz	
9794/2793	X	X	X	X	X	X	Base PCI 2-Line WAN w/Modem	Short, 32-bit, 66MHz	
9933/2793	X	X	X	X	X	X	PCI 2-Line WAN w/Modem IOPless	Short, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>Dual mode adapter</li> <li>Requires V5R4M5 or later.</li> </ul>
9934/2793	X	X	X	X	X	X	PCI 2-Line WAN w/Modem IOPless CIM	Short, 32-bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>Dual mode adapter</li> <li>Requires V5R4M5 or later.</li> </ul>

Table 29. i5/OS PCI adapters table (continued)

4811 4812 9812 9813		X	X	X	X	X	Base PCI Integrated xSeries Server	Long, double-width, 64 bit, 66 MHz, 3.3 V	<ul style="list-style-type: none"> <li>Contains a 2.0GHz processor with 2MB integrated L2 cache</li> <li>Two integrated 1000/100/10Mbps Ethernet ports, two USB 1.1 ports and traditional PC keyboard and mouse ports</li> <li>A keyboard and mouse can either connect to the traditional ports or connect to the USB ports</li> <li>An SVGA video port for connection of a display.</li> <li>This feature has two memory slots. These slots must always contain a pair of identical memory features</li> <li>Available memory features are: #9726 - Base 512MB Server Memory (Initial order only) #8546 - Opt Base 1 Gb Server Memory (Initial order only) #0446 - 512MB DDR Server Memory (MES only) #0447 - 1 Gb DDR Server Memory (MES only) The #9812 requires an IOP (#2844, #9744 or #9844) to drive it.</li> </ul>
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## Linux PCI adapters

The PCI adapters listed in this section are supported on IBM System i5 and eServer i5 models running the Linux operating system.

Cards controlled by a Linux operating system do not use or require PCI IOPs.

The model 515 will support these feature codes: 0620, 0621 0647, 5700, 5701, 5706, 5707, 5721, 5722, and 5727.

Table 30. Linux PCI adapters

Feature/ CCIN	Systems/ Expansion units				Description	Adapter characteristics	Other information
	520 525	550	570	595			
0601/2743	X	X	X	X	Direct Attach-2743	Short, 64-bit, 66MHz	
0602/2760	X	X	X	X	Direct Attach-2760	Short, 64-bit, 66MHz	
0603/2744	X	X	X	X	Direct Attach Token Ring	Short, 32-bit, 66MHz	

Table 30. Linux PCI adapters (continued)

0607/4838	X	X	X	X	Direct Attach-4838: PCI 100/10 Mbps Ethernet IOA	Short, 32-bit, 33 MHz	
0608/2745	X	X	X	X	Direct Attach-4745: PCI Two-Line WAN IOA	Short, 32-bit, 33MHz	
0609/2772	X	X	X	X	Direct Attach-2772: PCI Dual WAN/Modem IOA	Short, 32-bit, 33MHz	
0610/2772	X	X	X	X	Direct Attach-2773: PCI Dual WAN/Modem IOA (ANSI)	Short, 32-bit, 33MHz	
0611/2765	X	X	X	X	Direct Attach-2765: PCI Fibre Channel Tape Controller	Short, 64-bit, 66MHz	• High bandwidth
0612/2766	X	X	X	X	Direct Attach-2766: PCI Fibre Channel Disk Unit Controller	Short, 64-bit, 66MHz	• High bandwidth
0613/2742	X	X	X	X	Direct Attach-2742: PCI Two-Line WAN IOA	Short, 32-bit, 66MHz	
0614/2793	X	X	X	X	Direct Attach-2793: PCI 2-Line WAN with Modem	Short, 32-bit, 66MHz	
0615/2793	X	X	X	X	Direct Attach-2794: PCI 2-Line WAN with Modem (complex impedance matching)	Short, 32-bit, 66MHz	
0616/2805	X	X	X	X	Direct Attach-2805: PCI Quad Modem IOA	Long, 32-bit, 66MHz	
0617/2805	X	X	X	X	Direct Attach-2806: PCI Quad Modem IOA (complex impedance matching)	Long, 32-bit, 66MHz	
0620/5700	X	X	X	X	Direct Attach-5700: IBM Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	<ul style="list-style-type: none"> <li>• EEH Supported</li> <li>• High Bandwidth</li> <li>• Place in 64-bit PCI-X slot if available</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot</li> </ul>
0621/5701	X	X	X	X	Direct Attach-5701: IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	<ul style="list-style-type: none"> <li>• EEH Supported</li> <li>• High Bandwidth</li> <li>• Place in 64-bit PCI-X slot if available</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot"</li> </ul>
0623/2849	X	X	X	X	Direct Attach-2849	Short, 32-Bit, 33 MHz, 3.3 or 5 V	• EEH Supported
0624/5702	X	X	X	X	Direct Attach-5702: PCI-X Dual Channel Ultra320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>• EEH Supported</li> <li>• High Bandwidth</li> </ul>
0625/5704	X	X	X	X	Direct Attach-5704, Fibre Channel	Short, 32 or 64-bit, 3.3V	• High Bandwidth



Table 30. Linux PCI adapters (continued)

0626/2787	X	X	X	X	Direct Attach-2787: PCI-X Fibre Channel Disk Unit Controller	Short, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High Bandwidth</li> </ul>
0627/2780	X	X	X	X	Direct Attach-2780: PCI-X Ultra4 RAID Disk Ctrl	Long, 64-bit, 133MHz	<ul style="list-style-type: none"> <li>High Bandwidth</li> <li>This feature is not supported in slot C01 of models 5074, 5079, 5094, and 5294</li> </ul>
0628/5703	X	X	X	X	Direct Attach-5703: PCI-X Dual Channel Ultra320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>EEH supported</li> <li>High Bandwidth</li> <li>Supported in AIX</li> </ul>
0629/280D	X	X	X	X	Direct Attach, Fibre Channel	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>Extra-high bandwidth</li> </ul>
0630	X	X	X	X	See 5713 in Table 31 on page 311.		
0631	X	X	X	X	See 5714 in Table 31 on page 311.		
0632	X	X	X	X	See 2738 in Table 31 on page 311.		
0633	X	X	X	X	See 2849 in Table 31 on page 311.		
0637			X	X	See 4961 in Table 31 on page 311.		
0645/5702	X	X	X	X	Direct Attach-5712: PCI-X Dual Channel Ultra320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>EEH Supported</li> </ul>
0646	X	X	X	X	See 5716 in Table 31 on page 311.		
0647/571A	X	X	X	X	Direct Attach-5736: PCI-X Dual Channel Ultra320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>EEH Supported</li> <li>Extra-high bandwidth if used with disks</li> </ul>
0648/571B	X	X	X	X	Direct Attach-5736: PCI-X Dual Channel Ultra320 SCSI Raid Adapter	Long, 32 or 64-bit, 3.3V	<ul style="list-style-type: none"> <li>EEH Supported</li> <li>Extra-high Bandwidth</li> </ul>
0650/571F 0651/571F 0654/571F	X	X	X	X	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide)	Long, 64-bit, 3.3V, 266 MHz	<ul style="list-style-type: none"> <li>Dual-mode capable adapter</li> <li>EEH Supported</li> <li>Extra-high bandwidth</li> <li>For more information about this adapter and slot restrictions, see Table 16 on page 260 and “High-performance SCSI and SAS controller placement” on page 271.</li> </ul>
2737		X	X	X	See 2737 in Table 31 on page 311.		
2848	X	X	X	X	See 2848 in Table 31 on page 311.		
4962	X	X	X	X	See 4962 in Table 31 on page 311.		

Table 30. Linux PCI adapters (continued)

5706/5706	X	X	X	X	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 64-bit, 3.3 or 5 V	<ul style="list-style-type: none"> <li>• High Bandwidth</li> <li>• Place in 64-bit PCI-X slot if available</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> </ul>
5707/5707	X	X	X	X	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 64-bit, 3.3 or 5 V	<ul style="list-style-type: none"> <li>• High Bandwidth</li> <li>• Place in 64-bit PCI-X slot if available</li> <li>• If this feature is placed in a model 5074 or 5079 tower, it must be placed in 32 bit slot.</li> </ul>
5709/5709	X	X	X		RAID Enabler Card, Special adapter card for RAID	Custom location slot	
5721/573A	X	X	X	X	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	<ul style="list-style-type: none"> <li>• Extra-high bandwidth</li> <li>• None allowed in PCI slot (PCI-X is acceptable)</li> <li>• None allowed in 32 bit slot</li> <li>• Maximum of 2 adapters per PHB</li> <li>• For best performance, do not combine other extra-high or high bandwidth adapters in the same PHB.</li> <li>• Place in slots 5-9 when the adapter is used in one of these expansion units: 5094, 5294, 0588, 5088, 0694, 8294, or 9194.</li> <li>• Recommended in DDR slot.</li> <li>• Maximum of 6 per RIO HSL-2 loop.</li> <li>• Maximum of 3 per HSL loop.</li> <li>• Maximum or near maximum quantity of adapters assumes some adapters are for backup or are running at reduced capacity.</li> <li>• If an AIX or Linux partition is used in the same PHB, then 5718 or 5719 are not supported with the 5721/5722.</li> </ul>
5722/576A	X	X	X	X	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	
5727/573D	X	X			Integrated Cache – 40 MB	NA	
5740/5740	X	X	X	X	See 5740 in Table 31 on page 311		
5759/5759	X	X	X	X	See 5759 in Table 31 on page 311.		
6203			X	X	See 6203 in Table 31 on page 311.		

Table 30. Linux PCI adapters (continued)

6204	X	X	X	X	See 6204 in Table 31.		
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## AIX PCI adapters

The PCI adapters listed in this section are supported on System i models running the AIX operating system.

Not all adapters are supported on all system models. Check the IBM Prerequisite Web site at

[http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) to verify that an adapter is supported on your system model and to verify which release of AIX is required.

19xx features are not supported on System i.

The model 515 and 525 will support these feature codes: 0620, 0621 0647, 5700, 5701, 5706, 5707, 5721, 5722, and 5727.

AIX is not supported on the 0588 and 5088 I/O expansion units.

All adapters support Extended Error Handling (EEH).

Table 31. PCI and PCI-X adapters that are supported by the AIX and Linux operating system.

Feature/ CCIN	Description	Adapter characteristics	Linux support	Other information
1905/1905	4 Gb Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
1910/1910	4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1912/1912	PCI-X DDR Dual Channel Ultra320 LVD SCSI Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
1913/1913	PCI-X DDR Dual Channel Ultra320 LVD SCSI RAID Adapter	Long, 64-bit 3.3V	Y	• High bandwidth
1954/1954	4-Port 10/100/1000 Base-TX PCI-X Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
1957/1957	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1958/1958	Gigabit Ethernet-SX Low Profile PCI-X Adapter (Fibre)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1959/1959	10/100/1000 Base-TX Ethernet Low Profile PCI-X Adapter (Copper)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1974/1974	PCI-X Dual Channel Ultra 320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
1975/1975	PCI-X Dual Channel Ultra 320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
1977/197E	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth

Table 31. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

1978/1978	Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1979/1979	10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32-bit, 3.3 or 5V	Y	• High bandwidth
1980/1980	GXT135P Graphics Accelerator with Digital Support	Short, 32-bit, 3.3 or 5V	Y	
1981/1981	10 Gigabit Ethernet -SR PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1982/1982	10 Gigabit Ethernet-LR PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
1983/1983	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1984/1984	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1985/1985	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	Y	
1986/573B	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	Y	• High bandwidth
1987/573C	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	Y	• High bandwidth
1990/1990	Low Profile Dual Port Gigabit ENET (UTP)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
1999/1999	Low Profile Dual Port Gigabit ENET (Fiber)	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
2498/4-X	PCI 4-Channel Ultra3 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3 or 5V	N	
2737/N-D	Keyboard/Mouse Attachment Adapter	Short, 32-bit, 3.3 or 5V	Y	
2738/2738	2 Port USB PCI Adapter	Short, 32-bit, 3.3 or 5V	Y	
2842/2842	POWER GXT4500P Graphics Accelerator	Long, 32 or 64-bit, 3.3 or 5V	Y	
2843/2843	POWER GXT6500P Graphics Accelerator	Long, 64-bit, 3.3 or 5V	Y	
2848/I-X	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32-bit, 3.3 or 5V	Y	• Not hot-pluggable
2849/2849	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32 or 64-bit, 3.3V	Y	• Not hot-pluggable
2943/3-B	8-Port Asynchronous Adapter EIA-232/RS-422, PCI bus	Short, 32-bit, 3.3 or 5V	N	
2944/3-C	128-Port Asynchronous Controller, PCI bus	Short, 32-bit, 3.3 or 5V	N	
2946/A-B	Turboways 622 Mbps PCI MMF ATM Adapter	Short, 64-bit, 3.3 or 5V	N	• High bandwidth

Table 31. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

2947/9-R	ARTIC960Hx 4-Port Multiprotocol PCI Adapter	Long, 32-bit, 3.3 or 5V	N	
2962/9-L	2-Port Multiprotocol PCI Adapter	Short, 32-bit, 3.3 or 5V	N	
4764/4764	PCI-X Cryptographic Coprocessor	Short, 64-bit, 3.3V	N	
4953/A-C	64bit/66MHz PCI ATM 155 UTP Adapter	Short, 32 or 64-bit, 3.3 or 5V	N	
4957/A-D	64bit/66MHz PCI ATM 155 MMF Adapter	Short, 32 or 64-bit, 3.3 or 5V	N	
4959/9-Y	Token-Ring PCI Adapter	Short, 32-bit, 3.3 or 5V	Y	
4960/6-J	Cryptographic Accelerator	Short, 32-bit, 3.3 or 5V	N	
4961/A-E	Universal 4-Port 10/100 Ethernet Adapter	Long, 32 or 64-bit, 3.3 or 5V	Y	
4962/A-F	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	Y	
4963/6-I	PCI Cryptographic Coprocessor (FIPS-4)	Short, 32-bit, 3.3 or 5V	N	
5700/5700	Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5701/5701	10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5703/5703	PCI-X Dual Channel Ultra320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
5706/5706	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5707/5707	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5710/5702	PCI-X Dual Channel Ultra320 SCSI Blind Swap Adapter	64-bit, 3.3 volt	Y	• High bandwidth
5711/5703	PCI-X Dual Channel Ultra320 SCSI RAID Blind Swap Adapter	Long, 32 or 64-bit, 3.3V	Y	• High bandwidth
5712/5712	PCI-X Dual Channel Ultra 320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
5713/5713	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5714/5714	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5716/280B	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	Y	• High bandwidth
5718/5718	10 Gigabit-SR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
5719/5719	10 Gigabit-LR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth

Table 31. PCI and PCI-X adapters that are supported by the AIX and Linux operating system. (continued)

5721/573A	10 Gb-SR Ethernet PCI-X 2.0 DDR Adapter	Short, 64 bit, 3.3 V	Y	• Extra-high bandwidth
5722/576A	10 Gb-LR Ethernet PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3 V	Y	• Extra-high bandwidth
5723/5723	2-Port EIA-232 Asynch PCI Adapter	Short, 32-bit, 3.3V or 5V	Y	• High bandwidth
5732/5732	Low Profile Dual Port Gigabit Enet (Fiber)	Short, 32 to 64-bit, 3.3V or 5V	Y	• High bandwidth
5736/ 5736	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter	Short, 32 to 64-bit, 3.3V	Y	• High bandwidth
5737/ 5737	PCI-X Dual Channel Ultra320 SCSI Raid- 2.0 DDR Adapter	Long, 64-bit, 3.3V	Y	• High bandwidth
5740/5740	4-Port 10/100/1000 Base-TX PCI-X Adapter	Short, 64-bit, 3.3V	Y	• High bandwidth
5758/5758	4 Gb Single-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 32 or 64-bit, 3.3V	Y	• High bandwidth
5759/5759	4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
5902/572B	PCI-X DDR Dual –x4 Port SAS RAID Adapter	Long, 64-bit, 3.3V	Y	• Extra-high bandwidth
5912/572A	PCI-X DDR External Dual – x4 Port SAS Adapter	Short, 64-bit, 3.3V	Y	• Extra-high bandwidth
6203/4-Y	PCI Dual Channel Ultra3 SCSI Adapter	Long, 32 to 64-bit, 3.3V or 5V	Y	
6204/4-U	PCI Universal Differential Ultra SCSI Adapter	Short, 32-bit, 3.3 or 5V	Y	
6228/4-W	2 Gigabit Fibre Channel Adapter for 64-bit PCI Bus	Short, 32 to 64-bit, 3.3V or 5V	Y	• High bandwidth
6230/4-P	Advanced Serial RAID Plus Adapter	Long, 32 to 64-bit, 3.3V or 5V	N	• High bandwidth
6239/5704	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 to 64-bit, 3.3V or 5V	Y	• High bandwidth
6310/6310	ARTIC960RxD Quad Digital Trunk PCI Adapter	Long, 32-bit, 3.3 or 5V	N	• Digital Trunk adapters have an internal cable and must be in contiguous slots.
6312/6312	Quad Digital Trunk Telephony PCI Adapter	Long, 32 or 64-bit, 3.3 or 5V	N	• Digital Trunk adapters have an internal cable and must be in contiguous slots.
8244/8244	Audio PCI Adapter for Workstations	Short, 32-bit, 3.3V	N	• Not hot-pluggable in model 52x

Additional System i feature codes that support AIX are listed in Table 32 on page 315. For a description of the feature listed in the Feature/CCIN column, see the corresponding feature code in the Corresponding

feature code column.

*Table 32. Additional System i feature codes that support AIX*

Feature/CCIN	Corresponding feature code
0611/2765	See 6228 in Table 31 on page 311.
0620/5700	See 5700 in Table 31 on page 311.
0621/5701	See 5701 in Table 31 on page 311.
0625/5704	See 6239 in Table 31 on page 311.
0627/2780	See 0627 in Table 30 on page 307.
0628/5703	See 5703 in Table 31 on page 311.
0229/280D	See 5758 in Table 31 on page 311.
0630/573B	See 5713 in Table 31 on page 311.
0631/573C	See 5714 in Table 31 on page 311.
0632/28EF	See 2738 in Table 31 on page 311.
0633	See 2849 in Table 31 on page 311.
0634	See 2944 in Table 31 on page 311.
0635	See 2962 in Table 31 on page 311.
0637	See 4961 in Table 31 on page 311.
0638	See 6230 in Table 31 on page 311.
0639	See 6231 in Table 31 on page 311.
0640	See 6235 in Table 31 on page 311.
0641/2780-574F	<p>Direct Attach-2780: PCI-X Ultra4 RAID Disk Controller with auxiliary cache adapter</p> <p>Long, 64-bit</p> <ul style="list-style-type: none"> <li>• High Bandwidth</li> <li>• This feature is not supported in slot C01 of models 5074, 5079, 5094, and 5294</li> </ul>
0642	See 2498 in Table 31 on page 311.
0645/5702	See 5712 in Table 31 on page 311.
0646	See 5716 in Table 31 on page 311.
0647/571A	See 5736 in Table 31 on page 311.
0648/571B	See 5737 in Table 31 on page 311.
0649/571E	<p>PCI-X Dual Channel Ultra320 SCSI Raid Adapter</p> <p>Long, 32 or 64-bit, 3.3V. 133 MHz</p> <ul style="list-style-type: none"> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• The 0649, 2757, 2780, 5582, 5583, 5580, 5581, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 52x, 550, and 570. These controllers can be placed in an attached expansion unit.</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and “High-performance SCSI and SAS controller placement” on page 271.</li> </ul>

Table 32. Additional System i feature codes that support AIX (continued)

Feature/CCIN	Corresponding feature code
0650/571F 0651/571F 0654/571F	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide)  Long, 64-bit, 3.3V, 266 MHz <ul style="list-style-type: none"> <li>• Dual-mode capable adapter</li> <li>• EEH Supported</li> <li>• Extra-high bandwidth</li> <li>• For more information about this adapter and slot restrictions, see Table 16 on page 260 and “High-performance SCSI and SAS controller placement” on page 271.</li> </ul>

## Placement Information

Follow System p placement guidelines when running the AIX operating system. Use the following table to identify which placement guidelines to use.

Table 33. Model name cross reference

IBM System i5 and eServer i5 Model	Corresponding System p model
520 system unit with 1.5 and 1.6 GHz processors (CCIN numbers 28D2, 5228, 5229, and 522A)	“Model 9111-520 (p5 520) adapter placement” on page 226
520 system unit with 1.9 GHz, POWER5+ processors (CCIN numbers 8325, 8327, 8330, 53C6, 53C2, and 53C3), the 515 system unit, and the 525 system unit	“Model 9131-52A (p5 520) adapter placement” on page 229
550 system unit with 1.6 GHz processors (CCIN number 5237)	“Model 9113-550 (p5 550) adapter placement” on page 232
550 system unit with 1.9 GHz, POWER5+ processors (CCIN number 8312, and 53C6)	“Model 9133-55A (p5 550) adapter placement” on page 235
570 system unit with 1.6 GHz processors (CCIN numbers 26EA, and 26F2)	“Model 9117-570 (p5 570) adapter placement” on page 242
570 system unit with 2.2 GHz, POWER5+ processors (CCIN numbers 8338, and 53C9)	“Model 9117-570 (p5 570) adapter placement” on page 242
595 system unit	“PCI adapter placement for expansion units” on page 248

## PCI adapter placement for OpenPower system units and expansion units

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

**Note:** In addition to these instructions, you can also use the System Planning Tool to determine adapter placement. Go to the Dynamic Logical Partitioning Web site at

<http://www-03.ibm.com/servers/eserver/support/tools/systemplanningtool/> .

### OpenPower PCI and PCI-X adapters

This section shows the OpenPower® PCI and PCI-X adapters supported by the Linux operating system.

**Note:**



1. Adapters can be serviced with the system power on (Hot-pluggable) unless noted that they must be serviced with the system power off (Not hot-pluggable).
2. All adapters support Extended Error Handling (EEH).

Feature/CCIN	Description	Adapter characteristics	Other information
1905/1905	4 Gigabit PCI-X 2.0 Single Port Fibre Channel Adapter	Short, 32 or 64-bit, 3.3V	• High bandwidth
1910/1910	4 Gigabit PCI-X 2.0 Dual Port Fibre Channel Adapter	Short, 64-bit, 3.3V	• Extra-high bandwidth
1912/1912	PCI-X DDR Dual Channel Ultra320 LVD SCSI Adapter	Short, 64-bit, 3.3V	• High bandwidth
1913/1913	PCI-X DDR Dual Channel Ultra320 LVD SCSI Adapter	Long, 64-bit, 3.3V	• High bandwidth
1957/1957	2 Gigabit Fibre Channel PCI-X Short PIC bracket Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
1974/1974	PCI-X Dual Channel Ultra320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	• High bandwidth
1975/1975	PCI-X Dual Channel Ultra320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	• High bandwidth
1977/197E	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
1978/1978	IBM Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
1979/1979	IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32-bit, 3.3 or 5V	• High bandwidth
1980/1980	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32-bit, 3.3 or 5V	
1981/1981	10 Gigabit Ethernet-SR PCI-X Adapter	Short, 64-bit, 3.3V	• Extra-high bandwidth
1982/1982	10 Gigabit Ethernet-LR PCI-X Adapter	Short, 64-bit, 3.3V	• Extra-high bandwidth
1983/1983	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
1984/1984	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
1985/1985	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	
1986/573B	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	• High bandwidth
1987/573C	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	• High bandwidth
2738/2738	2 Port USB PCI Adapter	Short, 32-bit, 3.3 or 5V	
2849/2849	POWER GXT135P Graphics Accelerator with Digital Support	Short, 32 or 64-bit, 3.3V	Not hot-pluggable in model 720
4962/A-F	10/100 Mbps Ethernet PCI Adapter II	Short, 32-bit, 3.3 or 5V	
5700/5700	Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
5701/5701	10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth

5703/5703	PCI-X Dual Channel Ultra320 SCSI RAID Adapter	Long, 32 or 64-bit, 3.3V	• High bandwidth
5706/5706	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
5707/5707	2-Port Gigabit Ethernet-SX PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
5712/5712	PCI-X Dual Channel Ultra 320 SCSI Adapter	Short, 32 or 64-bit, 3.3V	• High bandwidth
5713/5713	1 Gigabit-TX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	• High bandwidth
5714/5714	1 Gigabit-SX iSCSI TOE PCI-X Adapter	Short, 32 or 64 bit, 3.3 or 5V	• High bandwidth
5716/280B	2 Gigabit Fibre Channel PCI-X Adapter	Short, 32 or 64-bit, 3.3 or 5V	• High bandwidth
5718/5718	10 Gigabit-SR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	• Extra-high bandwidth
5719/5719	10 Gigabit-SR Ethernet PCI-X Adapter	Short, 64-bit, 3.3V	• Extra-high bandwidth
5723/5723	2-Port EIA-232 Asynch PCI Adapter	Short, 32-bit, 3.3V or 5V	• High bandwidth

## Logical partition (LPAR) considerations

Learn about LPAR considerations related to PCI adapter placement.

Place redundant devices in separate I/O units for the best performance. Place nonredundant devices in the same I/O unit. If you place nonredundant devices in one unit, the system is less exposed to other-unit failures.

Some devices do not have enhanced error handling (EEH) capabilities built in to their device drivers. If these devices fail, the PCI bridge set in which they are placed are affected. If the I/O subsystem encounters a severe error, all slots in the PCI bridge set are also affected. To clear this condition, you can reboot the system. In addition, it is also possible to remove the failed PCI slots on an affected PCI bridge set from the partition profile or profiles that include these PCI slots, and reboot the partition or partitions that terminated at the time of the error. To avoid PCI bridge set errors related to non-enhanced error handling adapters, if a non-enhanced error handling adapter is used, all slots on that PCI bridge set should be assigned to a single partition.

## Model 9123-710 adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

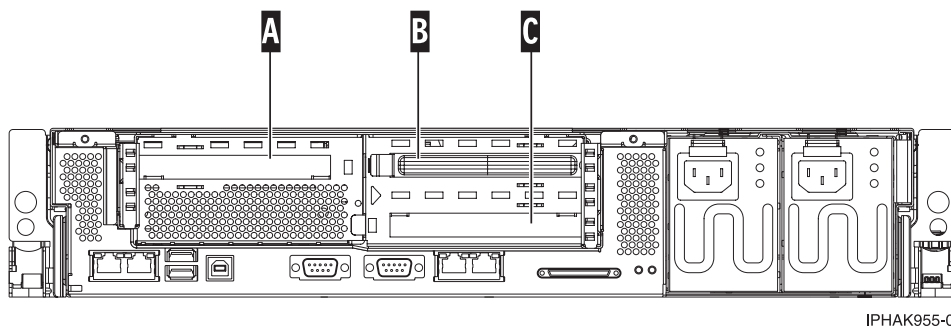


Figure 189. Rack mounted system unit back view with three PCI slots available.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 34. Slot location description

PHB2		
Slot 1 (A)	Slot 2 (B)	Slot 3 (C)
Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P2-C1	Un-P2-C2	Un-P2-C3

- Slots C1 through C3 are compatible with PCI and PCI-X adapters.
- All slots are long slots
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)
- None of the slots in this system are hot-pluggable.

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and maximum number of specified adapters recommended. If the space in the **Maximum number of adapters allowed** is blank, there is no maximum limit for that adapter.

Feature Code	Base Unit slot priority	Maximum number of adapters allowed
5721 **	1, 2, 3	1
5722**	1, 2, 3	1
1982**	1, 2, 3	1
1981**	1, 2, 3	1
1954*	1, 2, 3	2
5740*	1, 2, 3	2
1984*	1, 2, 3	3
1983*	1, 2, 3	3
1978*	1, 2, 3	3
1979*	1, 2, 3	3
1910 **	1, 2, 3	1
5759 **	1, 2, 3	1

1905 *	1, 2, 3	2
5758 *	1, 2, 3	2
1986 *	1, 2 ,3	3
5713 *	1, 2 ,3	3
1987*	1, 2 ,3	3
5714*	1, 2 ,3	3
1977*	1, 2, 3	3
1913 *	1, 2, 3	3
5737 *	1, 2, 3	3
1912 *	1, 2, 3	3
1974*	1, 2, 3	3
1975*	1, 2, 3	3
1980	1, 2, 3	1
1985	1, 2, 3	1
5723	1, 2, 3	2
2738	1, 2, 3	1

\*\* Extra High Bandwidth (EHB) adapter. See the *Performance notes* before installing this adapter.

\* High Bandwidth (HB) adapter. See the **Performance notes** before installing this adapter.

For more information about listed adapters, see “OpenPower PCI and PCI-X adapters” on page 316.

### Performance notes (for optimum performance)

System unit information:

- A maximum of one 10 Gb Ethernet port allowed on a 2 way system.
- No more than three Gb Ethernet ports per PHB or system.
- No more than three high-bandwidth adapters per PHB or system.
- If one 10 Gb port is present, no other 10 Gb or 1 Gb ports are allowed for optimum performance.
- No more than three Gb Ethernet ports per on CPU in a system.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

### Model 9124-720 adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters.

Select the appropriate information from this list:

- System unit back view
- PCI slot description
- Recommended system unit slot placement and maximums
- Performance notes (for optimum performance)

### System unit back view

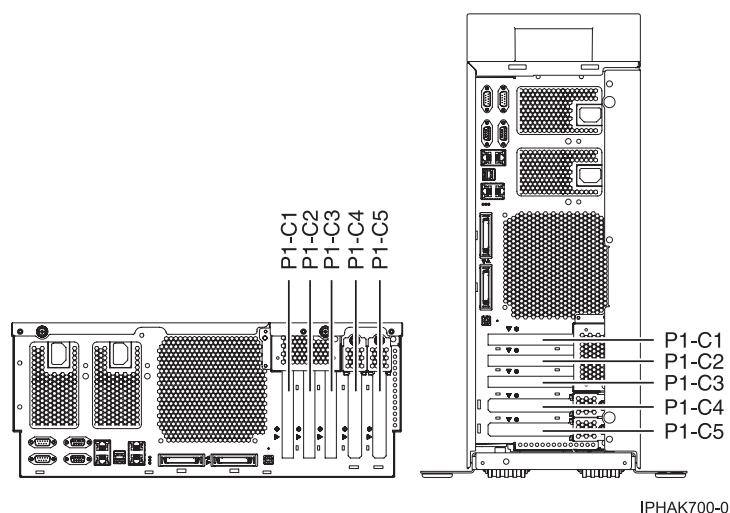


Figure 190. Rack mounted and desktide system unit back view with numbered slots.

### PCI slot description

- The following table shows the slot properties and PHB connections.

Table 35. Model OpenPower 720 slot location descriptions

PHB0				PHB2		
Slot 1	Slot 2	Integrated Dual 1 Gb Ethernet	Integrated SCSI U320	Slot 3	Slot 4	Slot 5
Long	Long			Long	Long	Short
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	133 MHz	133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	Short, 64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2			Un-P1-C3	Un-P1-C4	Un-P1-C5

- Slots C1 through C5 are compatible with PCI and PCI-X adapters.
- Short adapters can go in short or long slots.
- All slots support Enhanced Error Handling (EEH)

### Recommended system unit slot placement and maximums

See the following table to identify the recommended system unit slot placement and the recommended maximum number of specified adapters.

Feature Code	Base unit slot priority	Maximum number of adapters allowed in base unit
5721**	1, 3, 2, 4, 5	1
5722**	1, 3, 2, 4, 5	1
1982**	1, 3, 2, 4, 5	1
1981**	1, 3, 2, 4, 5	1
1954*	1, 3, 2, 4, 5	4
5740*	1, 3, 2, 4, 5	4
1984*	1, 3, 2, 4, 5	5
1983*	1, 3, 2, 4, 5	5
5706*	1, 3, 2, 4, 5	5
5707*	1, 3, 2, 4, 5	5

1979*	1, 3, 2, 4, 5	5
1978*	1, 3, 2, 4, 5	5
5701*	1, 3, 2, 4, 5	5
5700*	1, 3, 2, 4, 5	5
1910*	1, 3, 2, 4, 5	2
5759*	1, 3, 2, 4, 5	2
1905*	1, 3, 2, 4, 5	4
5758*	1, 3, 2, 4, 5	4
1986*	1, 3, 2, 4, 5	4
1987*	1, 3, 2, 4, 5	4
5713*	1, 3, 2, 4, 5	4
5714*	1, 3, 2, 4, 5	4
1977*	1, 3, 2, 4, 5	5
5716*	1, 3, 2, 4, 5	5
1913*	1, 3, 2, 4	5
5737*	1, 3, 2, 4	5
1912*	1, 3, 2, 4, 5	5
1974*	1, 3, 2, 4, 5	5
5712*	1, 3, 2, 4, 5	5
5703*	1, 3, 2, 4	4
1975*	1, 3, 2, 4	4
2849	2, 5, 1, 4, 3	2
1980	2, 5, 1, 4, 3	2
4962	2, 5, 1, 4, 3	5
1985	2, 5, 1, 4, 3	5
5723	2, 5, 1, 4, 3	2
2738	2, 5, 1, 4, 3	2
2738	3, 1, 4, 2, 5	2

\*\* Extra High Bandwidth (EHB) adapter. See the *Performance notes* before installing this adapter.

\* High Bandwidth (HB) adapter. See the **Performance notes** before installing this adapter.

For more information about listed adapters, see “OpenPower PCI and PCI-X adapters” on page 316.

### Performance notes (for optimum performance)

System unit information:

- No more than three Gb Ethernet ports per PHB. This total should include the two integrated Gb Ethernet ports on PHB 0.
- No more than three high bandwidth adapters per PHB
- No more than one extra high bandwidth adapter per PHB and two per base system
- No more than one 10 Gb Ethernet port per two CPUs in a system. If one 10 Gb Ethernet port is present per two CPUs, no other 10 Gb or 1 Gb ports allowed for optimum performance.

- No more than two 1 Gb Ethernet ports per one CPU in a system. More Ethernet adapters can be added for connectivity.

**Note:** The cumulative sum of extra high-performance adapters cannot exceed the system max for extra high-performance adapters.

## Updating the worldwide port name for a new 2766, 2787, or 280E IOA

If you have exchanged a 2766, 2787, or 280E Fibre Channel IOA, the IBM external storage subsystem must be updated to use the worldwide port name (WWPN) of the new 2766, 2787, or 280E IOA. Any SAN hardware using WWPN zoning might also need updating.

The WWPN can be found using the Hardware Service Manager in SST or DST. Display detail on the 2766, 2787, or 280E IOA Logical Hardware Resource information, and use the port worldwide name field.

The 16-digit WWPN can also be determined by appending the digits "1000" to the beginning of the 12-digit IEEE address found on the tailstock label of the Fibre Channel IOA.

## Increasing I/O adapter memory allocation

The memory allocation for certain PCI slots can be increased to take advantage of the performance improvements in PCI adapters designed to use this feature. Use the information in this section to increase I/O adapter memory allocation.

Not all adapters will benefit from the increased memory. To see if an adapter is designed to use increased memory allocation, consult the documentation that comes with the adapter.

When this feature is not enabled, which is the default setting, 128 MB of memory is allocated for 32-bit PCI slots and 256 MB of memory is allocated for PCI 64-bit slots.

To enable increased I/O adapter memory allocation, see [Enabling I/O adapter memory allocation](#).

The following tables show the memory allocation for each slot when the additional memory allocation feature is enabled. The PCI memory size column shows the amount of PCI memory that is allocated to the adapter at boot time, while the Translation Control Entry (TCE) range shows the memory allocated to the adapter at runtime. The rows in **bold** show the slots with enhanced memory allocation.

### Model 520 system unit

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	2	1, 2	128 MB	256 MB
C2	2	3	127 MB	128 MB
C3	0	3	128 MB	128 MB
<b>C4</b>	<b>2</b>	<b>7, 8</b>	<b>1536 MB</b>	<b>1024 MB</b>
C5	0	7, 8	128 MB	256 MB
<b>C6</b>	<b>0</b>	<b>1, 2</b>	<b>1536 MB</b>	<b>1024 MB</b>

### Model 550 system unit

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	0	1, 2	128 MB	256 MB
<b>C2</b>	<b>0</b>	<b>7, 8</b>	<b>640 MB</b>	<b>1024 MB</b>

Slot	PHB	EADS slot number	PCI memory size	TCE range
C3	2	1, 2	128 MB	256 MB
C4	2	5, 6	128 MB	256 MB
C5	2	7, 8	1536 MB	1024 MB

#### Model 570 system unit

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	2	1, 2	128 MB	256 MB
C2	2	7, 8	640 MB	1024 MB
C3	1	1, 2	127 MB	256 MB
C4	1	3, 4	128 MB	256 MB
C5	1	5, 6	128MB	256 MB
C6	1	7, 8	1536 MB	1024 MB

#### Model 575 processor node

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	1	1, 2	1023 MB	1024 MB
C2	1	5, 6	1024 MB	1024 MB
C3	2	1, 2	511 MB	1024 MB
C4	2	5, 6	512 MB	1024 MB

#### Model 5790 and machine type 7311 model D11 expansion drawer

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	1	1, 2	127 MB	256 MB
C2	1	3, 4	128 MB	256 MB
C3	1	7, 8	1792 MB	1024 MB
C4	2	1, 2	127 MB	256 MB
C5	2	3, 4	128 MB	256 MB
C6	2	7, 8	1792 MB	1024 MB

#### Models 5095, 0595, and machine type 7311 model D20 expansion drawers and desk-side units

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	2	1, 2	127 MB	256 MB
C2	2	3, 4	128 MB	256 MB
C3	2	5, 6	128 MB	256 MB
C4	2	7, 8	1664 MB	1024 MB
C5	0	1, 2	127 MB	256 MB
C6	0	3, 4	128 MB	256 MB
C7	0	7, 8	1792 MB	1024 MB



### Model 7040-61D expansion drawer

Slot	PHB	EADS slot number	PCI memory size	TCE range
C1	1	1, 2	127 MB	256 MB
C2	1	3, 4	128 MB	256 MB
C3	1	5, 6	128 MB	256 MB
<b>C4</b>	<b>1</b>	<b>7, 8</b>	<b>1664 MB</b>	<b>1024 MB</b>
C5	2	1, 2	128 MB	256 MB
C6	2	3, 4	128 MB	256 MB
<b>C7</b>	<b>2</b>	<b>5, 6</b>	<b>640 MB</b>	<b>1024 MB</b>
C8	0	1, 2	128 MB	256 MB
C9	0	3, 4	128 MB	256 MB
<b>C10</b>	<b>0</b>	<b>7, 8</b>	<b>640 MB</b>	<b>1024 MB</b>

### Related procedures

In order to install, remove, or replace a PCI adapter you may need to perform one or more of these related procedures.

## Related concepts

“PCI adapters” on page 1

You might need to place, install or remove Peripheral Component Interconnect (PCI) or PCI-X features on POWER5 systems. Use the procedures in this section to perform these tasks.

## Avoiding electric shock

Observe the follow precautions in order to avoid electric shock when working on or around the system.

### 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.

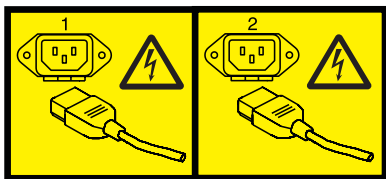
(D005)

### DANGER

To prevent a possible shock from touching two surfaces with different protective ground (earth), use one hand, when possible, to connect or disconnect signal cables. (D001)

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

(L003)



or



## Handling static-sensitive devices

Electronic boards, adapters, media drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage. Take the following precautions to prevent damage to these devices from static electricity discharge.

- 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.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system.
- With the device still in its antistatic bag, touch it to the metal frame of the system.
- Grasp cards and boards by the edges. Avoid touching the components and gold-edge connectors on the adapter.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system at the same time.
- Handle the devices carefully to prevent permanent damage.

## PCI hot-plug manager access for AIX

You might need to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

The instructions for servicing PCI adapters with the system power on in AIX refer you to these procedures when it is appropriate to perform them.

**Note:** For an adapter to be serviced with the system power on, both the adapter and the system unit must support hot-plug procedures. To identify adapters that are hot-pluggable in the system you are servicing, refer to the following placement information:

- “PCI adapter placement for IBM System i5 and eServer i5 system units and expansion units” on page 254

### Accessing hot-plug management functions:

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

**Note:** Procedures performed on a PCI adapter with the system power on in AIX, 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 access the hot-plug menus, do the following:

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

### PCI hot-plug manager menu:

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. The following options are available from the PCI Hot Plug Manager menu.

**Note:** For information about the PCI slot LED states, see “Component LEDs” on page 329.

### List PCI hot-plug slots

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

### Add a PCI hot-plug adapter

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

**Note:** The system will indicate the slot holds an “Unknown” device until you perform the **Install/configure devices added after IPL** option to configure the adapter.

### Replace/remove a PCI hot-plug adapter

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

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

### Identify a PCI hot-plug slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the Identify state. See “Component LEDs.”

### Unconfigure a device

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

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

### Configure a defined device

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

### Install/configure devices added after IPL

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

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

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

### Component LEDs:

Individual LEDs are located on or near the failing components. Use the information in this section to interpret the LEDs.

The LEDs are located either on the component itself or on the carrier of the component (for example, memory card, fan, memory module, or processor). 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 on your system has an amber LED turned on or blinking, identify the problem and take the appropriate action to restore the system to normal.

*Resetting the LEDs in AIX:*

Individual LEDs are located on or near the failing components. You can use this procedure to reset the LEDs after you have completed a repair action.

After the repair action is completed, do the following:

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

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


## Installing or replacing a PCI adapter with the system power on in Virtual I/O Server

You might need to install or replace a PCI adapter in the Virtual I/O Server. Use the procedure in this section to perform this task.

The Virtual I/O Server includes a PCI Hot Plug Manager that is similar to the PCI Hot Plug Manager in AIX 5L™. The PCI Hot Plug Manager allows you to hot plug PCI adapters into the server and then activate them for the partition without having to reboot the system. Use the PCI Hot Plug Manager for adding, identifying, or replacing PCI adapters in the system that are currently assigned to the Virtual I/O Server.

### Getting started:

#### Prerequisites:

- If you are installing a new adapter, an empty system slot must be assigned to the Virtual I/O Server partition on the Hardware Management Console (HMC). This task can be done through dynamic logical partitioning (DLPAR) operations, but the Virtual I/O Server partition profile must also be updated so that the new adapter is configured to the Virtual I/O Server after a reboot.
- If you are installing a new adapter, ensure that you have the software required to support the new adapter and determine whether there are any existing PTF prerequisites to install. To do this, use the IBM Prerequisite Web site at [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf) .
- If you need help determining the PCI slot in which to place a PCI adapter, see “PCI adapter placement in the system unit or expansion unit” on page 209.

Follow these steps to access the Virtual I/O Server, PCI Hot Plug Manager:

1. Use the **diagmenu** command to open the Virtual I/O Server diagnostic menu. The menus are similar to the AIX 5L diagnostic menus.
2. Select **Task Selection**, then press Enter.
3. At the Task Selection list, select **PCI Hot Plug Manager**.

### Installing a PCI adapter:

To install a PCI adapter with the system power on in Virtual I/O Server, do the following:

1. From the PCI Hot Plug Manager, select **Add a PCI Hot Plug Adapter**, then press Enter. The Add a Hot-Plug Adapter window is displayed.
2. Select the appropriate empty PCI slot from those listed, and press Enter. A fast-blinking amber LED located at the back of the server near the adapter indicates that the slot has been identified.

3. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. The adapter installation is performed the same as in a stand-alone AIX 5L logical partition and includes the following sequence of events:
  - a. Set the adapter LED to the action state so that the indicator light for the adapter slot flashes
  - b. Physically install the adapter
  - c. Finish the adapter installation task in **diagmenu**.
4. Run the **cfgdev** command to configure the device for the Virtual I/O Server.

If you are installing a PCI, Fibre Channel adapter, it is now ready to be attached to a SAN and have LUNs assigned to the Virtual I/O Server for virtualization.

### Replacing a PCI Adapter:

**Prerequisite:** Before you can remove or replace a storage adapter, you must unconfigure that adapter. See “Unconfiguring storage adapters” for instructions.

To replace a PCI adapter with the system power on in Virtual I/O Server, do the following:

1. From the PCI Hot Plug Manager, select **Unconfigure a Device**, then press Enter.
2. Press F4 (or Esc +4) to display the **Device Names** menu.
3. Select the adapter you are removing in the **Device Names** menu.
4. In the **Keep Definition** field, use the Tab key to answer Yes. In the **Unconfigure Child Devices** field, use the Tab key again to answer YES, then press Enter.
5. Press Enter to verify the information on the **ARE YOU SURE** screen. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
6. Press F4 (or Esc +4) twice to return to the Hot Plug Manager.
7. Select **replace/remove PCI Hot Plug adapter**.
8. Select the slot that has the device to be removed from the system.
9. Select **replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
10. Press Enter which places the adapter in the action state, meaning it is ready to be removed from the system.

### Unconfiguring storage adapters:

Before you can remove or replace a storage adapter, you must unconfigure that adapter. Storage adapters are generally parent devices to media devices, such as disk drives or tape drives. Removing the parent requires that all attached child devices either be removed or placed in the define state.

Unconfiguring a storage adapter involves the following tasks:

- Closing all applications that are using the adapter you are removing, replacing, or moving
- Unmounting file systems
- Ensuring that all devices connected to the adapter are identified and stopped
- Listing all slots that are currently in use or a slot that is occupied by a specific adapter
- Identifying the adapter’s slot location
- Making parent and child devices unavailable
- Making the adapter unavailable

If the adapter supports physical volumes that are in use by a client partition, then you might need to perform steps on the client partition before unconfiguring the storage adapter. For instructions, see

“Preparing the client partitions.” For example, the adapter might be in use because the physical volume was used to create a virtual target device, or it might be part of a volume group used to create a virtual target device.

Follow these steps to unconfigure SCSI, SSA, and Fibre Channel storage adapters:

1. Log in as root user.
2. Use the `oem_setup_env` command to close all applications that are using the adapter you are unconfiguring.
3. Type `lsslot-c pci` to list all the hot plug slots in the system unit and display their characteristics.
4. Type `lsdev -C` to list the current state of all the devices in the system unit.
5. Type `umount` to unmount previously mounted file systems, directories, or files using this adapter.
6. Type `rmdev -l adapter -R` to make the adapter unavailable.

**Attention:** Do not use the `-d` flag with the `rmdev` command for hot plug operations because this action removes your configuration.

### Preparing the client partitions:

If their virtual target devices are not available, client partitions can fail or they might be unable to perform I/O operations for a particular application. You might have redundant Virtual I/O Server partitions, which allows for Virtual I/O Server maintenance and avoids downtime for client partitions. If you are replacing an adapter on the Virtual I/O Server and your client partition is dependent on one or more of the physical volumes accessed by that adapter, then you might need to take action on the client before you unconfigure the adapter.

The virtual target devices must be in the define state before the Virtual I/O Server adapter can be replaced. Do not remove the virtual devices permanently.

To prepare the client partitions so that you can unconfigure an adapter, complete the following steps depending on your situation:

*Table 36. Situations and steps for preparing the client partitions*

Situation	Steps
You have redundant hardware on the Virtual I/O Server for the adapter.	No action is required on the client partition.
You have redundant Virtual I/O Server partitions that, in conjunction with virtual client adapters, provide multiple paths to the physical volume on the client partition.	No action is required on the client partition. However, path errors might be logged on the client partition.
You have redundant Virtual I/O Server partitions that, in conjunction with virtual client adapters, provide multiple physical volumes that are used to mirror a volume group.	See the procedures for your client operating system. For example, for AIX, see Replacing a disk on the Virtual I/O Server in the IBM System p Advanced POWER Virtualization Best Practices Redpaper. The procedure for Linux is similar to this procedure for AIX.
You do not have Virtual I/O Server partitions.	Shut down the client partition.  For instructions, see one of the following tasks: <ul style="list-style-type: none"><li>• Shutting down AIX logical partitions using the HMC</li><li>• Shutting down Linux logical partitions using the HMC</li></ul>

## Using i5/OS System Service Tools to power off and power on a PCI slot

In the course of installing, removing, or replacing a PCI adapter with the system power on in i5/OS you might need to identify and power off a PCI slot. Use the procedure in this section to perform this task.

1. Bring up an i5/OS session and sign on to the system.



2. Type **strsst** on the command line of the Main Menu and then press Enter.
3. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
4. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
5. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
6. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
7. Type **9** (Hardware contained within package) in the *System Unit* or *Expansion Unit* field of the unit where you are replacing the card. Press Enter.
8. Select the option to **Include empty positions**.
9. Select **Concurrent Maintenance** on the card position where you want to replace the card and then press Enter.
10. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
11. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
12. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
13. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power off complete
14. The hardware resource can now be removed, installed or replaced. After the new hardware resource has been installed, continue to the next step.
15. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
16. Select **Assign to** on the resource that has an asterisk (\*) on the Work with Controlling Resource display. Press Enter.
17. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:  
Power on complete
18. Verify that the new resource is functional. Refer to “Verify the installed part” on page 404.  
“Find your current system configuration in i5/OS” on page 254  
You can use the System Service Tools in i5/OS to find your current system configuration.  
“Determine the best place to install your adapter” on page 255  
You can use the placement guidelines and detailed reference tables in this section to determine the best place to install your adapter.

## 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 later, 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>)

## 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.

## Location codes

In the course of installing, removing, or replacing a PCI adapter you might need to read location codes when identifying system components. Use this section as a reference for interpreting location codes.

**Note:** If your server uses machine type and model number in its location codes, read through column one in the following table. If your server uses feature codes and sequence numbers in its location codes read through column two in the following table. Each column defines the numbers following the U in the beginning of the location code.

Utttt.mmm.ssssss-A1	Uffff.ccc.ssssss-A1
The leftmost code is always U	The leftmost code is always U

<i>Utttt.mmm.ssssss-A1</i>	<i>Uffff.ccc.ssssss-A1</i>
<p><i>tttt</i> represents the unit type of the enclosure (drawer or node)</p> <p><b>Note:</b> Unit type is also known as machine type. This is the four digit name given to the system. Examples of unit type are: 9111, 9114, 7310 and 7040.</p>	<p><i>ffff</i> represents the feature code of the enclosure (drawer or node)</p> <p><b>Note:</b> The feature code is a four digit number used by your systems marketing and sales team to order expansion units and other features for the system unit. An example of a feature code is: 8691 which is the (feature) or order number for the 7040-W42 server expansion frame.</p>
<i>mmm</i> represents the model of the enclosure	<i>ccc</i> represents the sequence number of the enclosure
<i>ssssss</i> represents the serial number for the enclosure	<i>ssssss</i> represents the serial number of the enclosure
<p><b>Note:</b> The <i>mmm</i> or <i>ccc</i> number might not be displayed on all location codes for all servers. If the <i>mmm</i> value is not displayed, the location code is displayed in one of the following forms:</p> <p><i>Utttt.ssssss-A1</i></p> <p>OR</p> <p><i>Uffff.ssssss-A1</i></p>	

## Before you begin

Understand prerequisites for installing, removing, or replacing features and parts.

### 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)

### DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

Before you begin a replacement or installation procedure, perform these tasks:

1. If you are installing a new feature, ensure that you have the software required to support the new feature and determine if there are any existing PTF prerequisites.

To do this, go to the following Web site: [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf)

2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).

For information on backing up your system or logical partition, select from the following:

- AIX backup
- i5/OS backup

- Linux backup
3. Review the installation or replacement procedure for the feature or part.
  4. 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.
  5. Ensure that you have access to a medium, flat-blade screwdriver.
  6. If parts are incorrect, missing, or visibly damaged, do the following:
    - If you are replacing a part, contact your service provider or next level of support.
    - If you are installing a feature, contact one of the following:
      - Your service provider or next level of support.
      - In the United States, contact the IBM Rochester Manufacturing Automated Information Line (R-MAIL) at 1-800-300-8751.
- In countries outside of the United States, use the following Web site to locate your service and support telephone numbers:  
<http://www.ibm.com/planetwide>
7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, or your next level of support.
  8. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning, and then return to these instructions.

## Model 185 or A50

In the course of installing, removing, or replacing a PCI adapter you might need to perform related procedures such as removing the system unit covers or removing the system unit from a rack. Use the procedures in this section to perform these types of tasks.

### Identify a failing part on a model 7047-185 or 7037-A50:

You might need to use the light path diagnostics to help locate or identify a failing part. Use the procedure in this section to accomplish this task.

Light path diagnostics provide a path that you can follow to help you identify the source of an error. The server must be connected to a power source for the light-emitting diodes (LED) inside the server to be lit; the server does not have to be turned on for the LEDs to be lit.

The server is designed so that LEDs remain lit when the server is connected to an ac power source but is not turned on, provided that the power supply is operating correctly. This feature helps you to isolate the problem when the operating system is shut down.

Many errors are first indicated by a lit information LED or system-error LED on the operator information panel on the front of the server. If one or both of these LEDs are lit, one or more LEDs elsewhere in the server might also be lit and can direct you to the source of the error.

To identify a failing part follow these steps:

1. If this is a rack mounted server, "Place the rack-mounted model 7047-185 or 7037-A50 in the service position or operating position" on page 340.
2. "Remove and replace the model 7047-185 or 7037-A50 side cover" on page 347.
3. Find the light-path diagnostic card on top of the fan attached to the disk drive cage. Use the following figure and table to identify each light on the card.

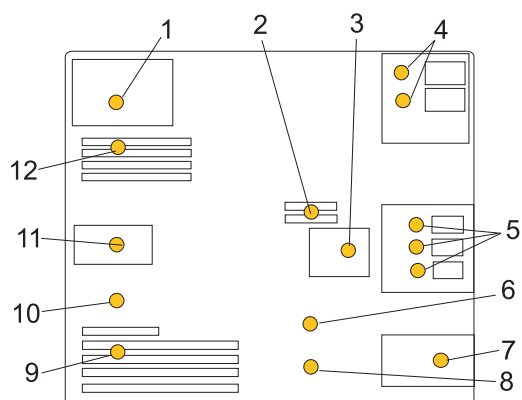


Figure 191. Light path diagnostic card indicator LED layout

Table 37. Fault-indicator LEDs

1	Power supply fault-indicator LED	7	Front fan fault-indicator LED
2	Voltage-regulator module fault-indicator LED	8	Battery fault-indicator LED
3	Disk-drive bay fan fault-indicator LED	9	PCI adapter fault-indicator LED
4	Optical-media bay fault-indicator LEDs	10	Thermal fault-indicator LED
5	Disk-drive bay fault-indicator LEDs	11	Rear fan fault-indicator LED
6	System backplane fault-indicator LED	12	Memory fault-indicator LED

- Refer to the service label on your system or the following figure to locate an LED on the system backplane for replaceable parts.

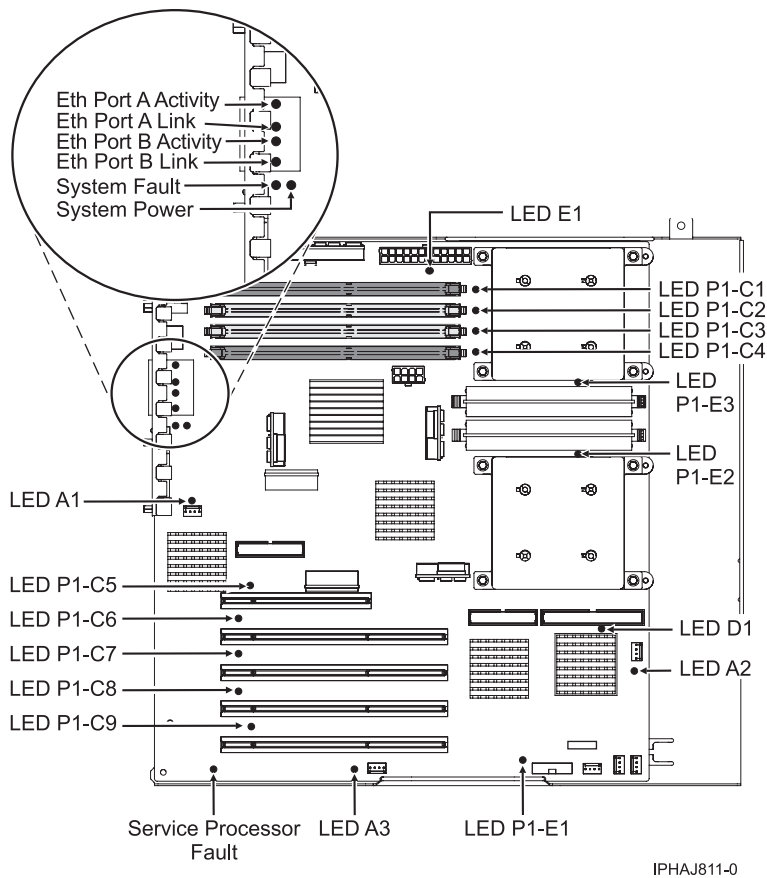


Figure 192. System backplane indicator LED layout

**Place the rack-mounted model 7047-185 or 7037-A50 in the service position or operating position:**

You might need to place a system or expansion unit into the service position or operating position to perform service or gain access to internal components. Use the instructions in this section to perform these tasks.

*Place the rack-mounted model 7047-185 or 7037-A50 in the operating position:*

You might need to place a system into the operating position to make the system available for use. Use the procedure in this section to perform this task.

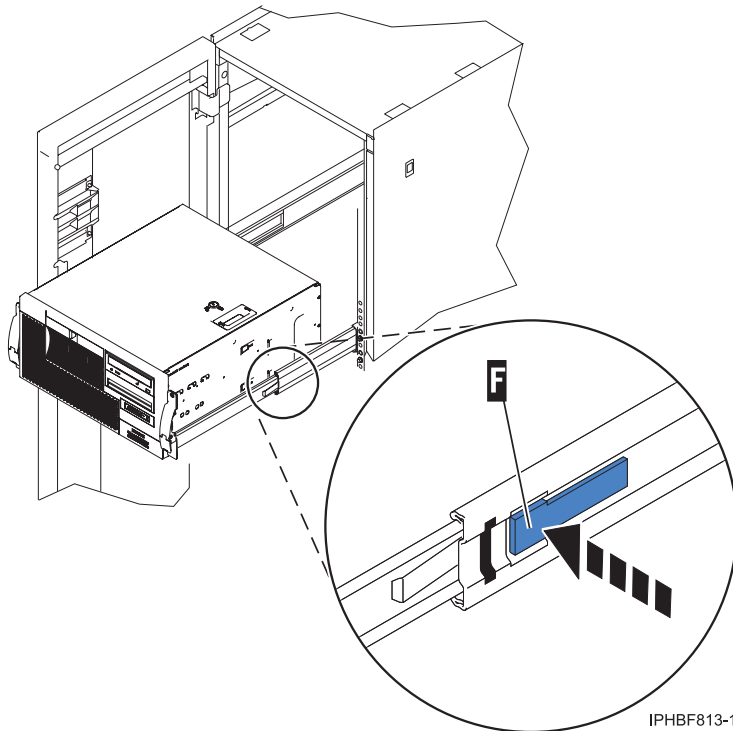
**Note:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches **F** located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.



**Note:** Ensure that the cables at the rear of the unit do not catch or bind as you push the unit back into the rack.



- a. Both rack latches should lock into position.
2. Replace and tighten the two thumbscrews that secure the system unit to the rack.
3. Close the front rack door.

*Place the rack-mounted model 7047-185 or 7037-A50 in the service position:*

You might need to place a system into the service position to perform service or gain access to internal components. Use the instructions in this section to perform this task.

**Tip:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system unit into the service position, follow these steps.

## 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)

## DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

1. If necessary, open the front rack door.
2. Release the rack latches **A** on both the left and right sides as shown in the following figure.
3. Review the following note, and then slowly pull the system unit **B** out from the rack until the rails are fully extended and locked.

#### Note:

- If the procedure you are performing requires you to unplug cables from the back of the system unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the unit out from the rack.

- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system unit from being pulled out too far.

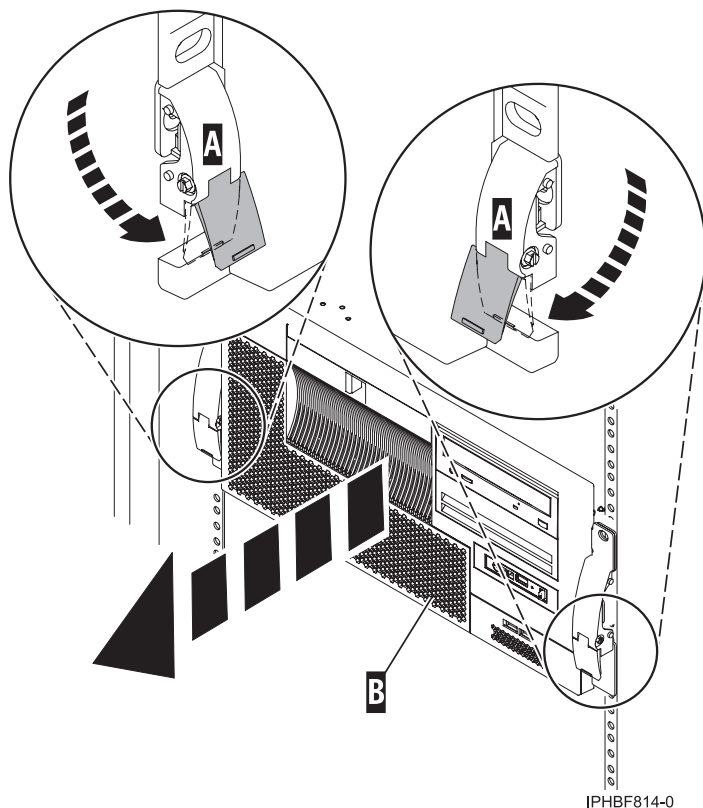


Figure 193. Placing the model in the service position

### Remove and replace model 7047-185 or 7037-A50 covers and doors:

You might need to remove and replace covers and doors to access components or perform service. Use the instructions in this section to accomplish these tasks.

*Remove and replace the model 7047-185 or 7037-A50 front cover:*

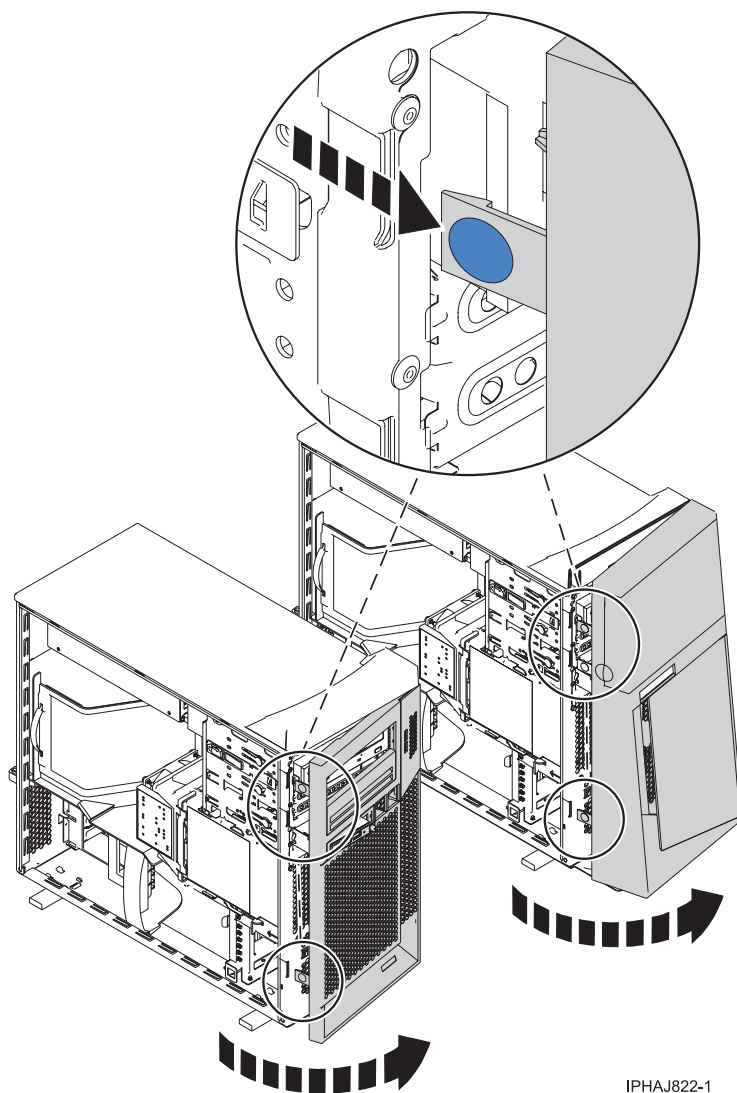
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the front cover follow these steps:

1. Remove the side cover. See, "Remove and replace the model 7047-185 or 7037-A50 side cover" on page 347
2. Lift each of the tabs on the front cover until it is released from the system unit, as shown in the following figure.

**Tip:** On the open face cover there are two tabs to release. On the acoustic feature front cover there are three tabs to release.

3. Pull the cover open until it can be removed from the system unit.



IPHAJ822-1

*Figure 194. Removing the front cover*

*Remove and replace the model 7047-185 or 7037-A50 acoustic-feature back cover:*

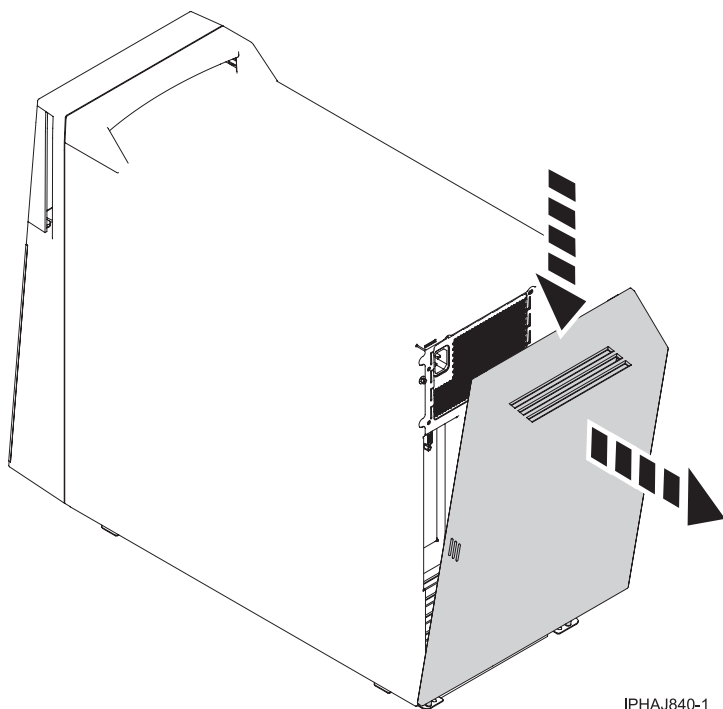
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the back cover follow these steps:

1. Press down on the center tab of the cover until you unseat it from the back of the system unit, as shown in the following figure.

**Remember:** Use care not to dislodge any of the cables or cords attached to the system unit during this procedure.

2. Lift the top of the cover until the pins on the bottom clear the holes and the cover can be removed.



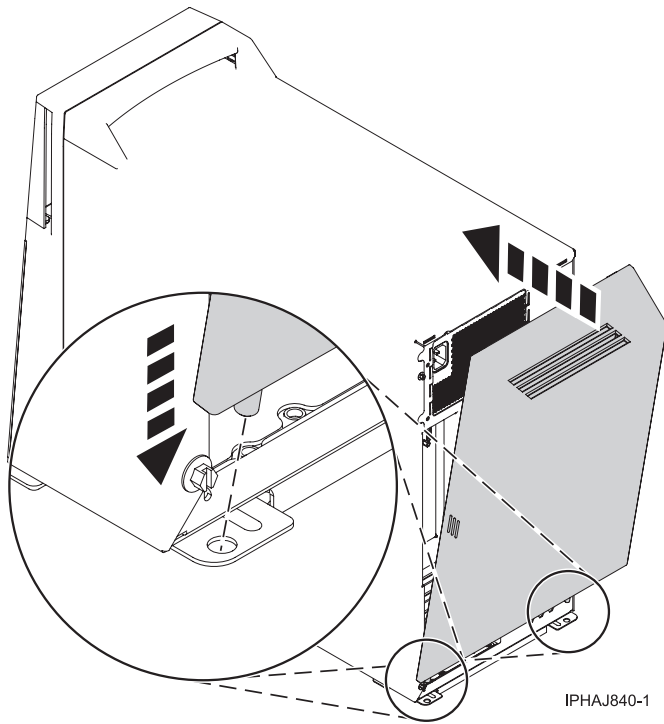
IPHAJ840-1

*Figure 195. Removing the back cover*

To replace the back cover follow these steps:

1. Attach all cables and cords.
2. Place the pins on the bottom of the cover into the slot at the bottom of the system unit, as shown in the following figure.
3. Rotate the cover until it snaps into place on the back of the system unit.

**Remember:** Use care not to dislodge any of the cables or cords attached to the system unit during this procedure.



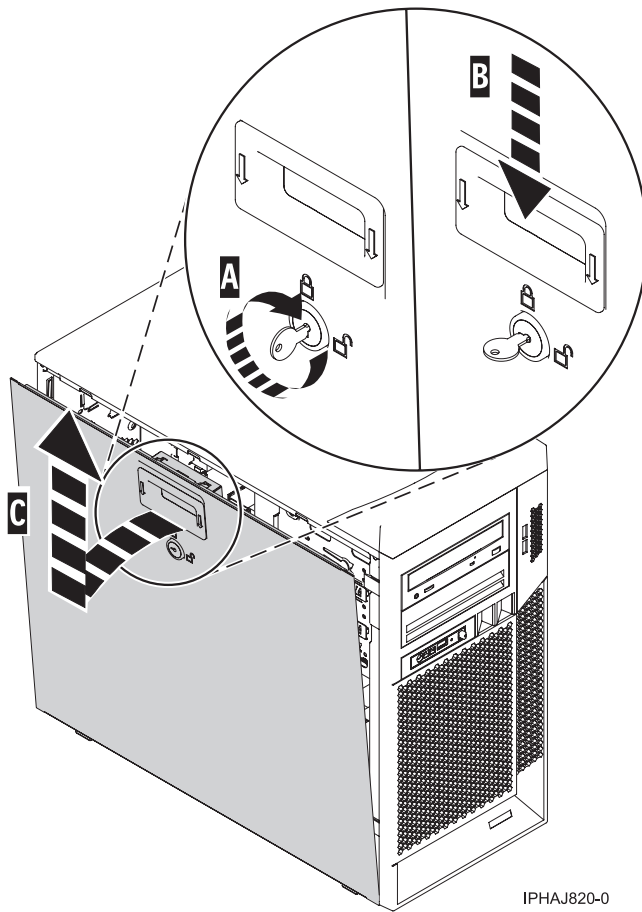
*Figure 196. Replacing the back cover*

*Remove and replace the model 7047-185 or 7037-A50 side cover:*

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the side cover follow these steps:

1. Unlock the security lock **A** if it is locked, as shown in the following figure.
2. Press down on the latch **B** to open the cover and pull it away from the system unit.
3. Lift the panel out of the ledge on the bottom of the system unit.



*Figure 197. Removing the side cover*

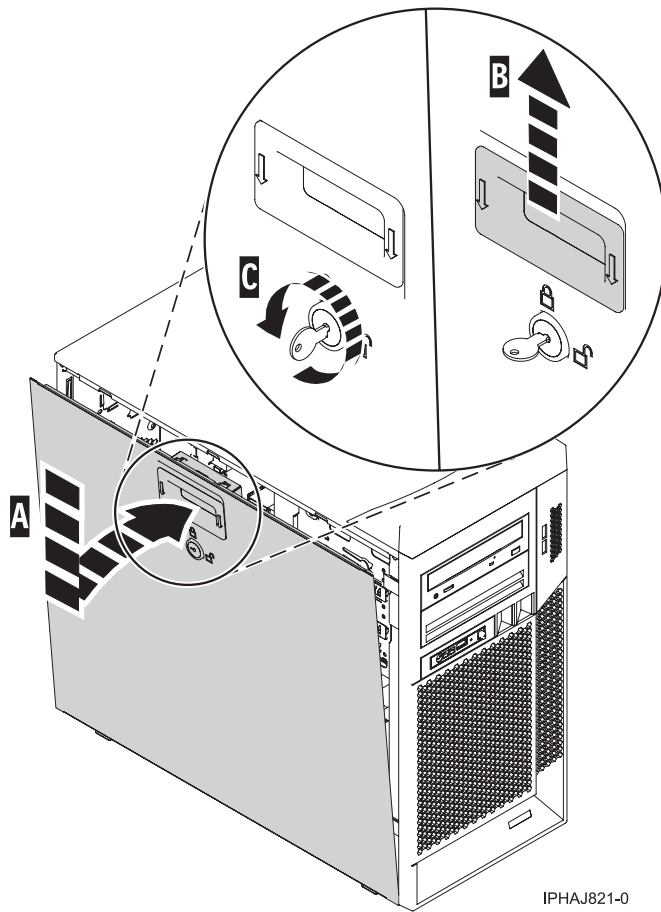
*Replace the side cover in a model 7047-185 or 7037-A50:*

You might need to replace the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To replace the side cover follow these steps:

1. Insert the bottom lip of the cover into the ledge on the bottom of the system unit.
2. Rotate the panel up **A** until the latch snaps into place **B**, as shown in the following figure.





IPHAJ821-0

*Figure 198. Replacing the service panel*

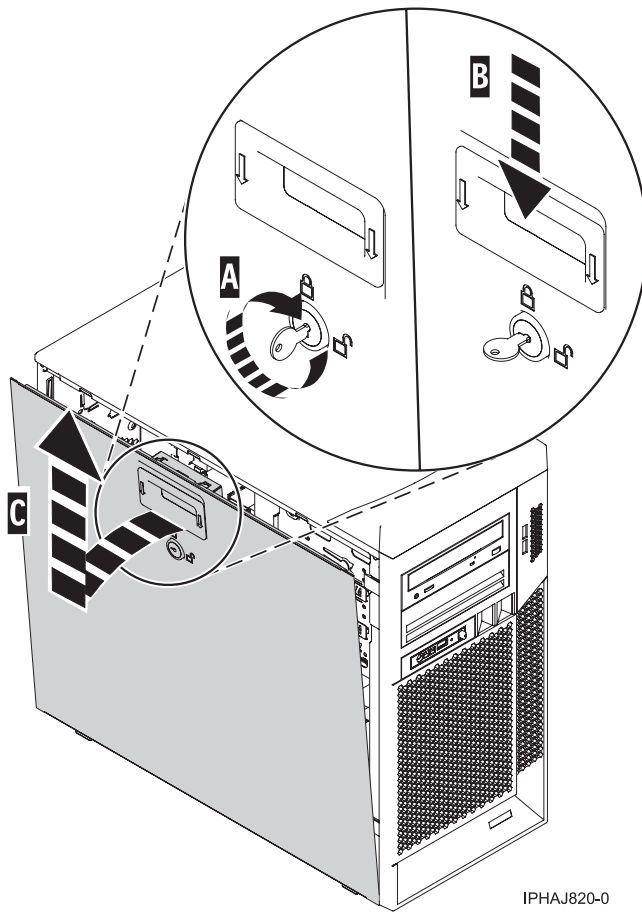
3. Lock the security lock **C** if needed.

**Remove and replace the model 7047-185 or 7037-A50 side cover:**

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the side cover follow these steps:

1. Unlock the security lock **A** if it is locked, as shown in the following figure.
2. Press down on the latch **B** to open the cover and pull it away from the system unit.
3. Lift the panel out of the ledge on the bottom of the system unit.



IPHAJ820-0

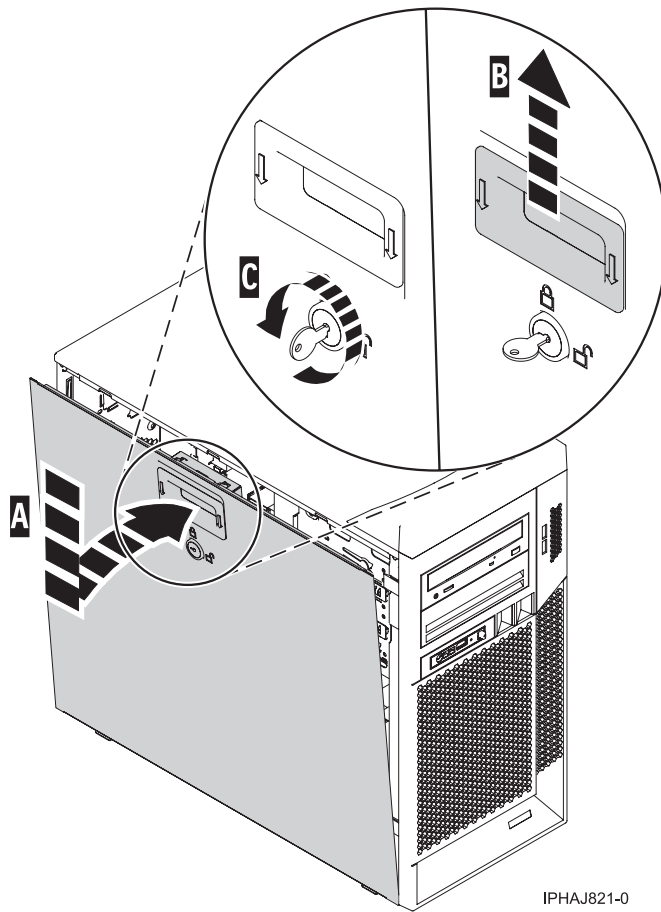
*Figure 199. Removing the side cover*

*Replace the side cover in a model 7047-185 or 7037-A50:*

You might need to replace the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To replace the side cover follow these steps:

1. Insert the bottom lip of the cover into the ledge on the bottom of the system unit.
2. Rotate the panel up **A** until the latch snaps into place **B**, as shown in the following figure.



IPHAJ821-0

*Figure 200. Replacing the service panel*

3. Lock the security lock **C** if needed.

**Gain access to the model 7047-185 or 7037-A50 control panel:**

Since only part of the control panel is visible from the front of the server, you can use this procedure to gain access to all of the control panel's features, including the display.

To access all of the control panel's features, complete the following steps:

1. Press inward on the spring-loaded tab **A** located on the right side of the control panel so that it pops out slightly, as shown in the following figure.

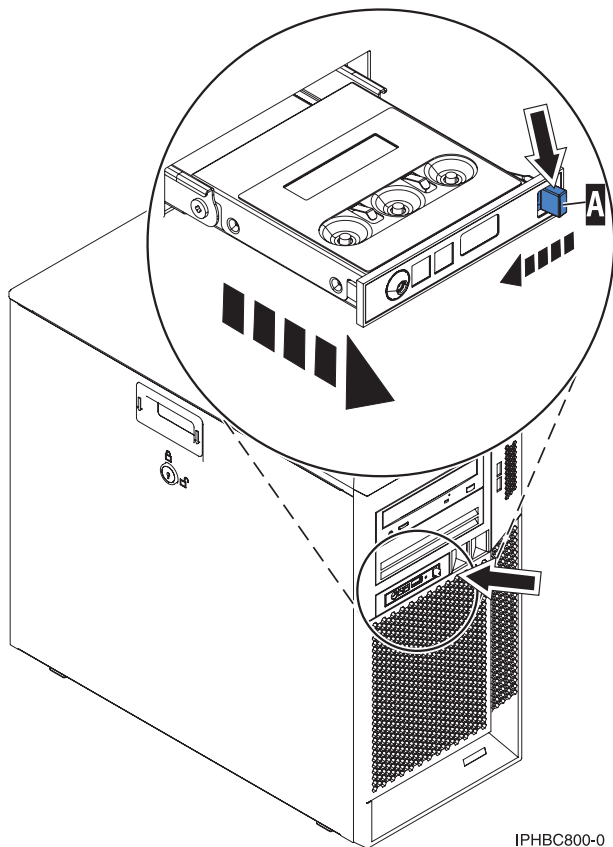


Figure 201. Gain access to the control panel

2. Pull the control panel out, toward the front of the system, until it can be pivoted downward on its hinge.
3. To move the control panel back into the device enclosure, lift the control panel up to align it with the opening and push it into place until you feel the tab lock.

## Model 505

In the course of installing, removing, or replacing a PCI adapter you might need to perform related procedures such as removing the system unit covers or removing the system unit from a rack. Use the procedures in this section to perform these types of tasks..

### Place the model 505 in the service position:

You might need to place a system into the service position to perform service or gain access to internal components. Use the instructions in this section to perform this task.

If you are servicing the fans or control panel see: “Open the model 505 service access panel” on page 357.

**Important:** To place the model 505 in the service position you will need to remove the system unit from the rack.

**Note:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

## 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)

## DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

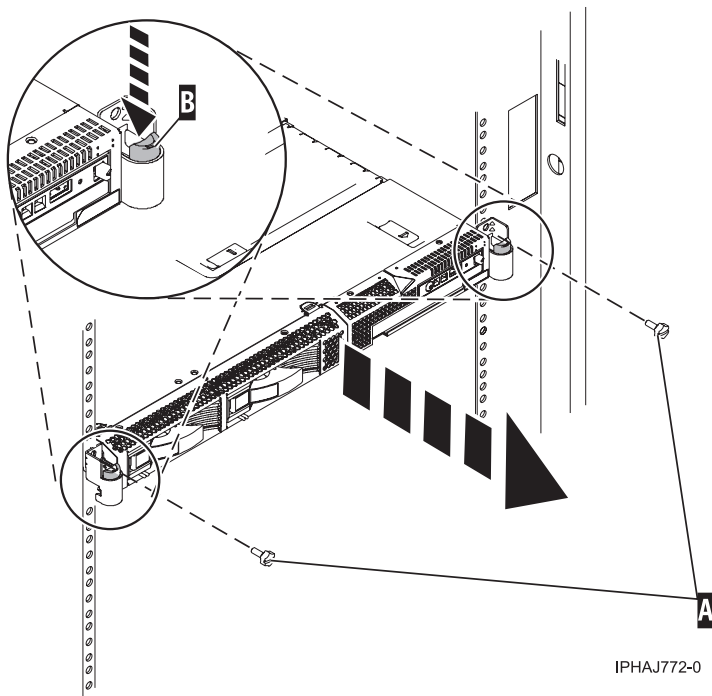
- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

To place the rack-mounted system unit into the service position, follow these steps:

1. Record any error or log messages before you stop the system.
2. Stop the system. For instructions see, "Stop the system or logical partition" on page 399.
3. If necessary, open the front rack door.
4. Carefully label and remove all cables and cords from the unit.
5. Remove the cable management arm from the system by doing the following:
  - a. Pull the release latch in the lower-left corner into the unlocked position.
  - b. Slide the cable management arm to the right detaching it from the system unit.

6. Remove the two screws **A** that secure the system unit to the rack as shown in the following figure.

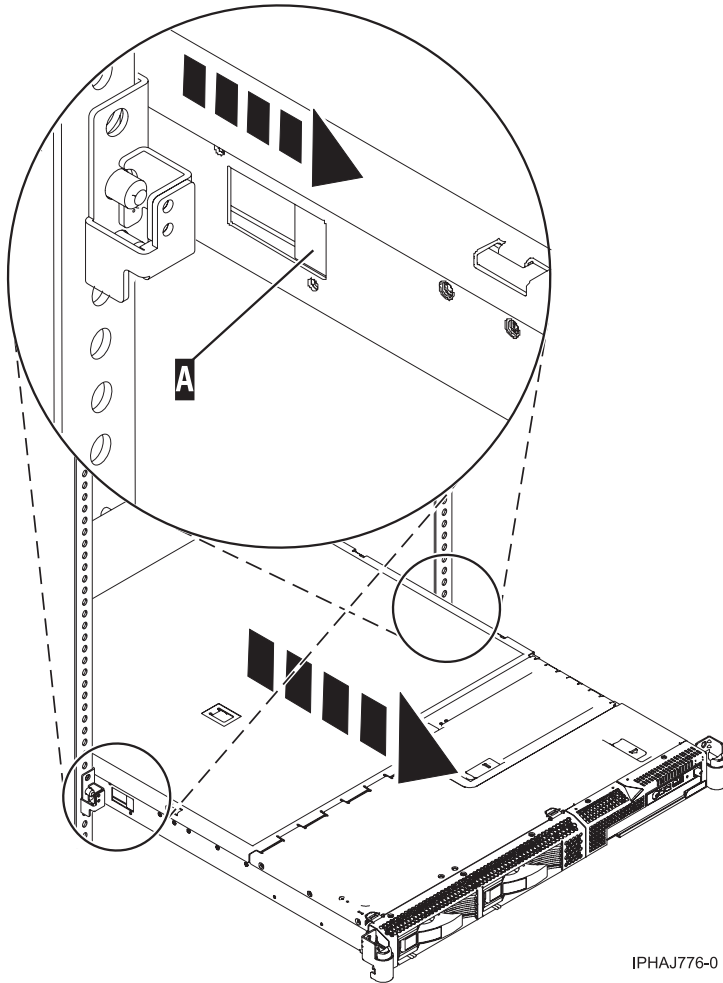


7. Release the rack latches **B** on both the left and right sides as shown in the previous figure.
8. Review the following notes, and then slowly pull the system unit out from the rack until the system unit is fully extended and locked.

**Note:**

- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system unit from being pulled out too far.

9. Press the rail safety latches **A** to release the system from the rack, as shown in the following figure.



10. Grasp each side of the system unit and pull the system unit out of the rack.

**CAUTION:**

**This unit weighs approximately 17 kg (37 pounds). Be sure you can safely support this weight when removing the system unit from the rack.**

11. Place the system unit on a sturdy flat surface capable of safely supporting the system unit while you are servicing it.

**Place the model 505 in the operating position:**

You might need to place a system into the operating position to make the system available for use. Use the procedure in this section to perform this task.

**Tip:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

To place the system unit into the operating position, follow these steps:

1. Lift the system unit, and position over the rails.

**CAUTION:**

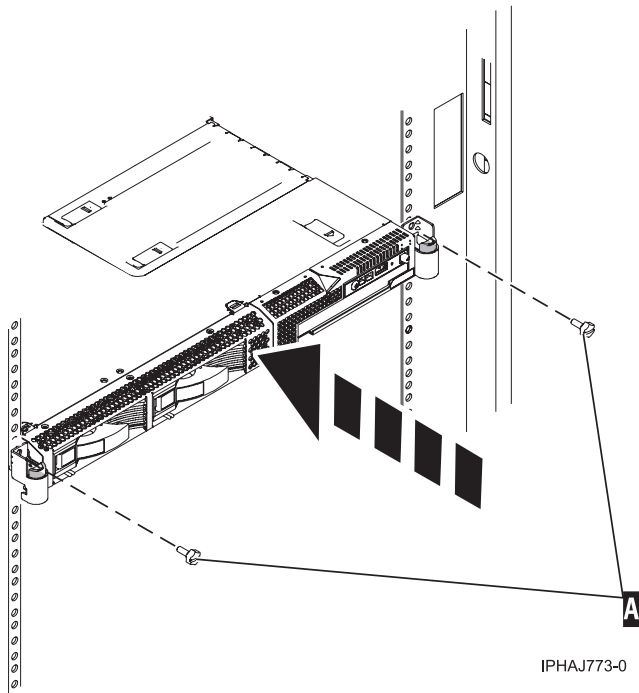
**This unit weighs approximately 17 kg (37 pounds). Be sure you can safely support this weight when placing the system unit from the rack.**

2. Simultaneously release the safety latches, located near the middle of each side of the system, and push the system unit into the rack. Both rack latches should lock into position.



**Note:** Ensure that the cables at the rear of the system unit do not catch or bind as you push the unit back into the rack.

3. Replace and tighten the two screws **A** that secure the system unit to the rack as shown in the following figure.



*Figure 202. Replace the thumbscrews*

4. Connect the cables and cords.
5. Replace the cable management arm.
6. Close the front rack door.

#### **Open the model 505 service access panel:**

You might need to open the service access panel to perform service on the fans, control panel, or to access other internal components. Use the procedure in this section to perform this task.

To open the service access panel on a rack-mounted model 505 follow these steps:

1. If necessary, open the front rack door.
2. If they are present, remove the two thumbscrews **A** that secure the system unit to the rack as shown in the following figure.

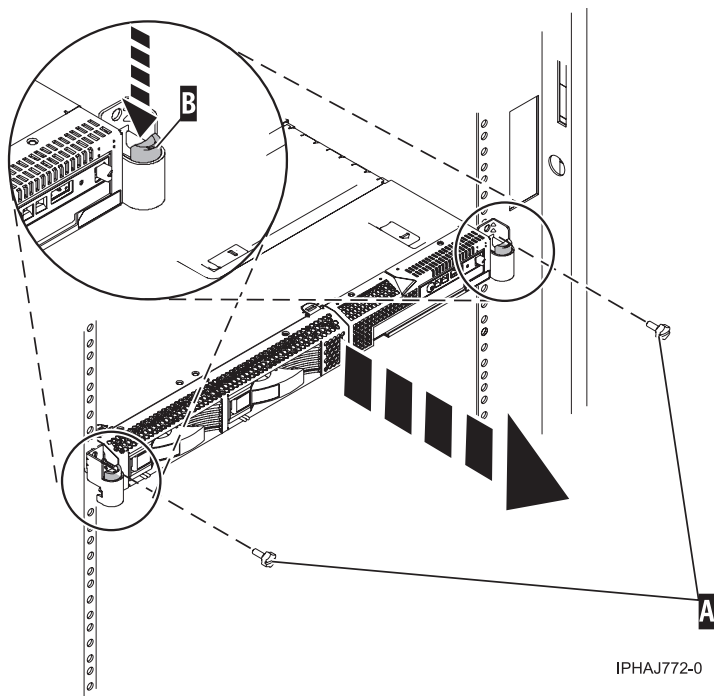
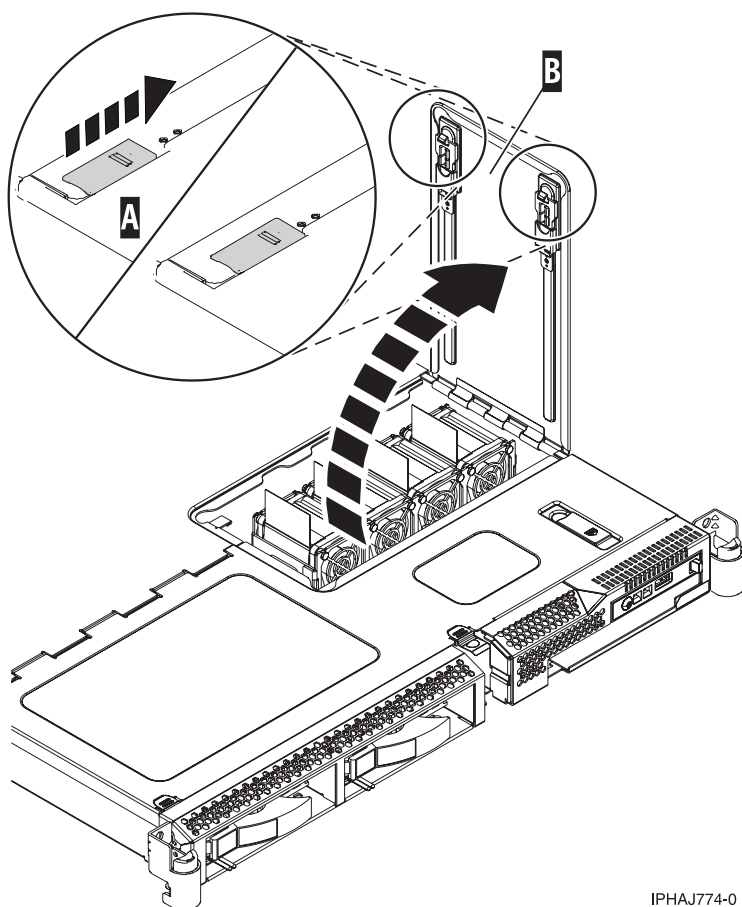


Figure 203. Remove thumbscrews

3. Release the rack latches **B** on both the left and right sides as shown in the previous figure.

**Note:**

- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the unit out from the rack.
  - When the rails are fully extended, the rail safety latches lock into place. This action prevents the system unit from being pulled out too far.
4. Slowly pull the system unit out from the rack until the service access panel is completely exposed.
  5. Push the panel release tabs **A** until you can open the panel lid, as shown in the following figure.
  6. Lift the panel lid **B** to its fully opened position.



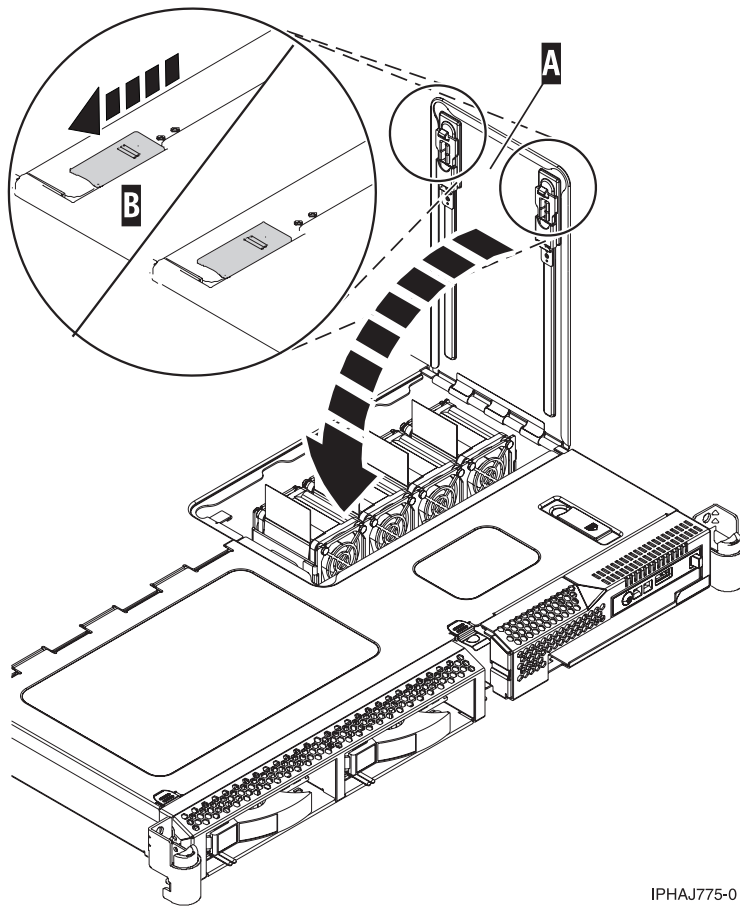
IPHAJ774-0

*Figure 204. Open the service access panel*

Complete the following steps to close the service access panel:

1. Close the panel lid **A**, as shown in the following figure.

*Figure 205. Close the service access panel*



IPHAJ775-0

2. Push the panel release tabs **B** back into the locked position.
3. Gently push the server back into the rack until the rack latches lock into place.
4. Replace the thumbscrews if necessary.

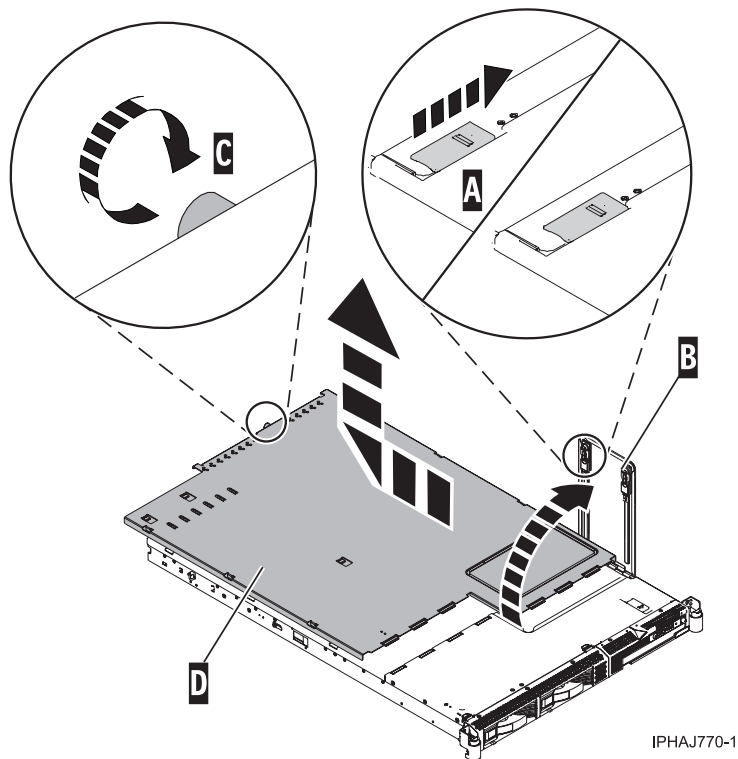
#### **Remove the service access cover from the rack-mounted model 505:**

You might need remove the service access cover to perform service or gain access to internal components. Use the procedure in this section to accomplish this task.

To remove the service access cover from a rack-mounted model follow these steps:

1. "Place the model 505 in the service position" on page 352.
2. Push the release tab **A** to open the service access panel **B**, as shown in the following figure.
3. Loosen the thumbscrew located at the back of the cover **C**.
4. Slide the cover **D** toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

**Attention:** For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.



IPHAJ770-1

Figure 206. Remove the service access cover

### Model 285, 510, 52x, 550, 550Q, 710, or 720

In the course of installing, removing, or replacing a PCI adapter you might need to perform related procedures such as removing the system unit covers or removing the system unit from a rack. Use the procedures in this section to perform these types of tasks.

#### Model 285, 52x, 55x, or OpenPower 720 door:

You might need to remove and replace the front door of a stand-alone model. This section includes procedures so that you can perform this task.

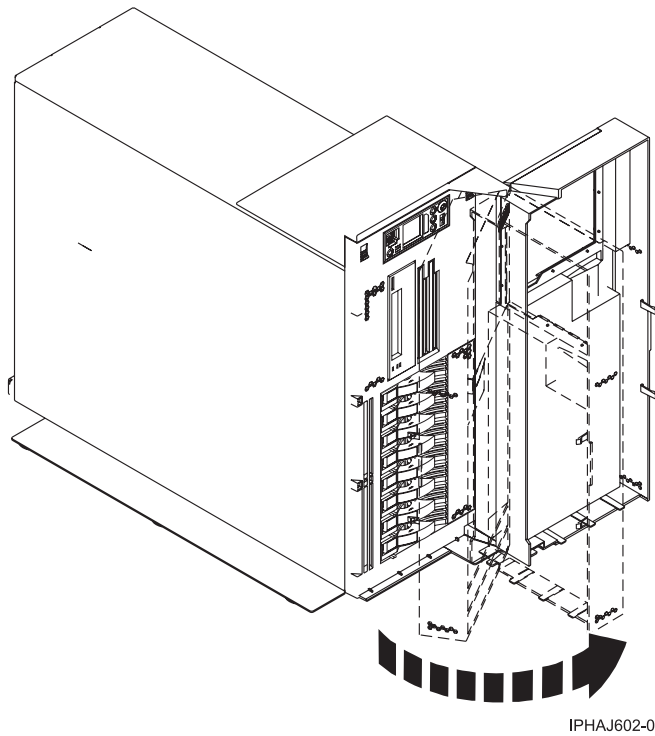
*Remove the door from the model 285, 52x, 55x, or OpenPower 720:*

You might need to remove the door to access components or perform service. Use the procedure in this section to accomplish this task.

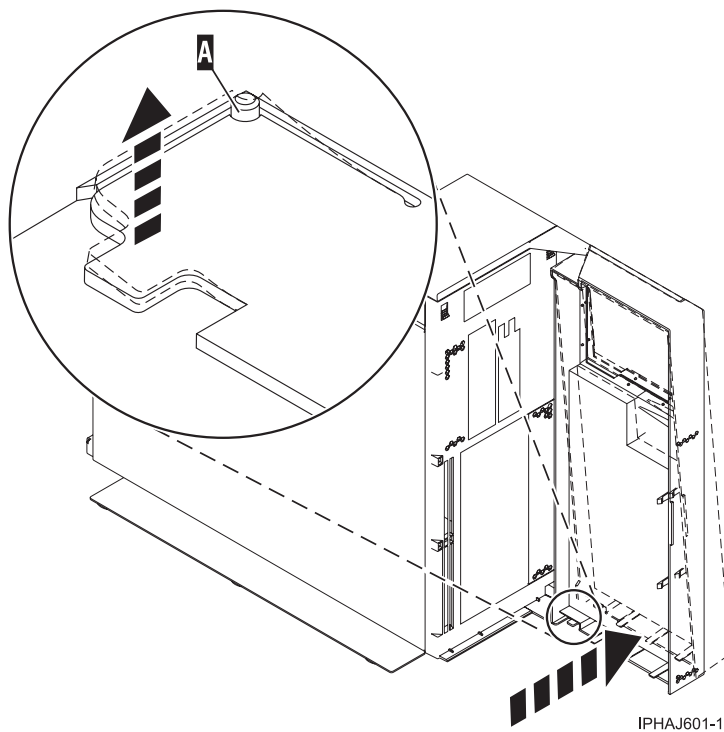
To remove the door from the model 285 or 9131-52A see, “Remove the door from the model 285 or 9131-52A” on page 362.

To remove the 52x, 55x, or OpenPower 720 door, do the following:

1. Open the front door by grasping the door handle and pulling the door out and away from the system unit as shown in the following figure.



2. To remove the door, press down on the top back edge of the door.
3. Gently swivel the top back edge of the door forward and out past the top of the system unit.
4. Lift the door up to release it from the lower retaining post.



*Remove the door from the model 285 or 9131-52A:*

You might need to remove the door to access components or perform service. Use the procedure in this section to accomplish this task.

The model 285 or 9131-52A has two doors. The top door allows access to the media and the bottom allows access to the DASD. Use the following procedure for removing both doors.

1. Open the door that you want to remove and release the tab at the center hinge point as shown in the following figure.
  - a. Lift up the bottom tab at hinge **A** to release the top door.
  - b. Press down on the top tab at the hinge **A** to release the bottom door
2. Gently swivel the top back edge of the door forward until it releases from the system unit.

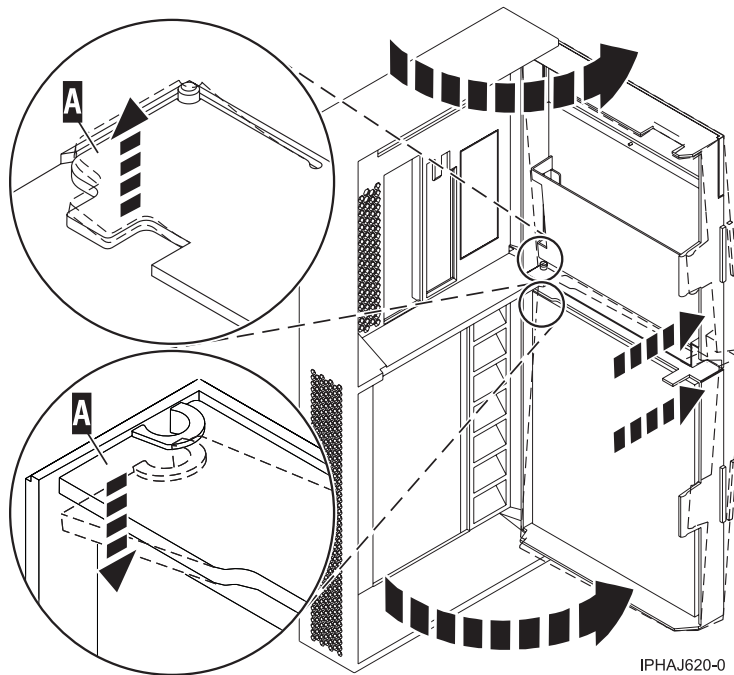


Figure 207. Removing the model 285 or 9131-52A door

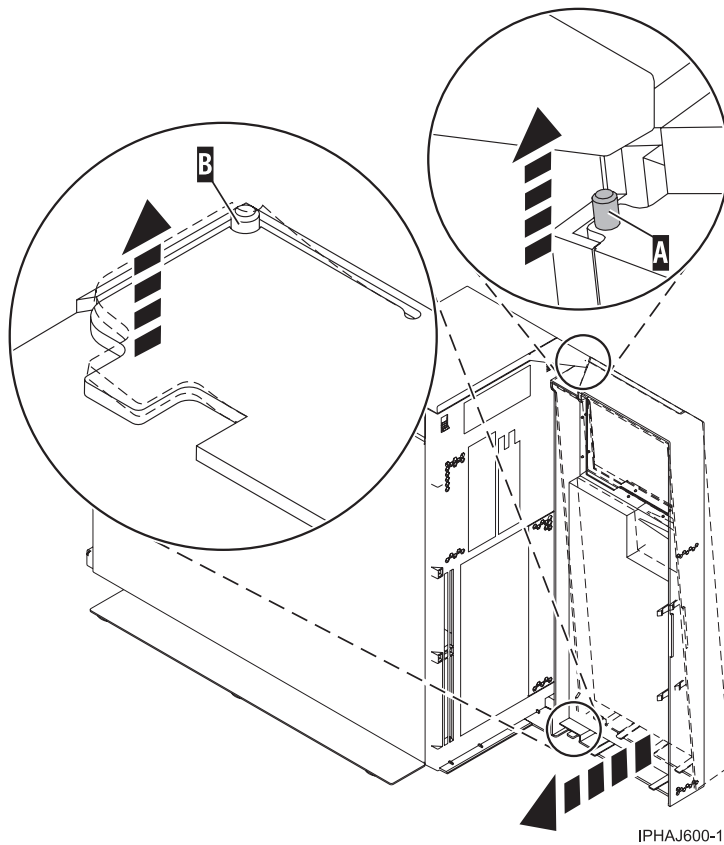
*Install or replace the door on the model 285, 52x, 55x, or OpenPower 720:*

You might need to install the door after accessing components or performing service. Use the instructions in this section to accomplish this task.

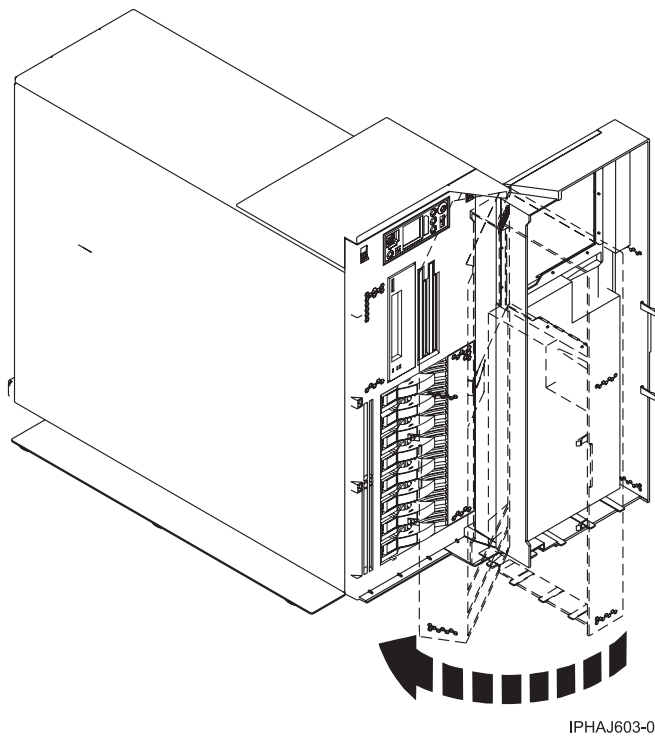
To install the model 285 or 9131-52A with acoustic feature front door see, “Install the door on the model 285 or 9131-52A” on page 364

To install the model 52x, 55x, or OpenPower 720 front door, do the following:

1. Set the door on the lower retaining post **B**, as shown in the following figure.
2. Rotate the door toward the top of the system unit.
3. Press down on the lower back edge of the door, and seat the top post **A** into its matching slot.



4. Close the door.



*Install the door on the model 285 or 9131-52A:*



You might need to install the door after accessing components or performing service. Use the instructions in this section to accomplish this task.

The model 285 or 9131-52A has two doors. The top door covers the media bays, and the bottom door covers the DASD bays.

1. Set the door into the retaining post A.

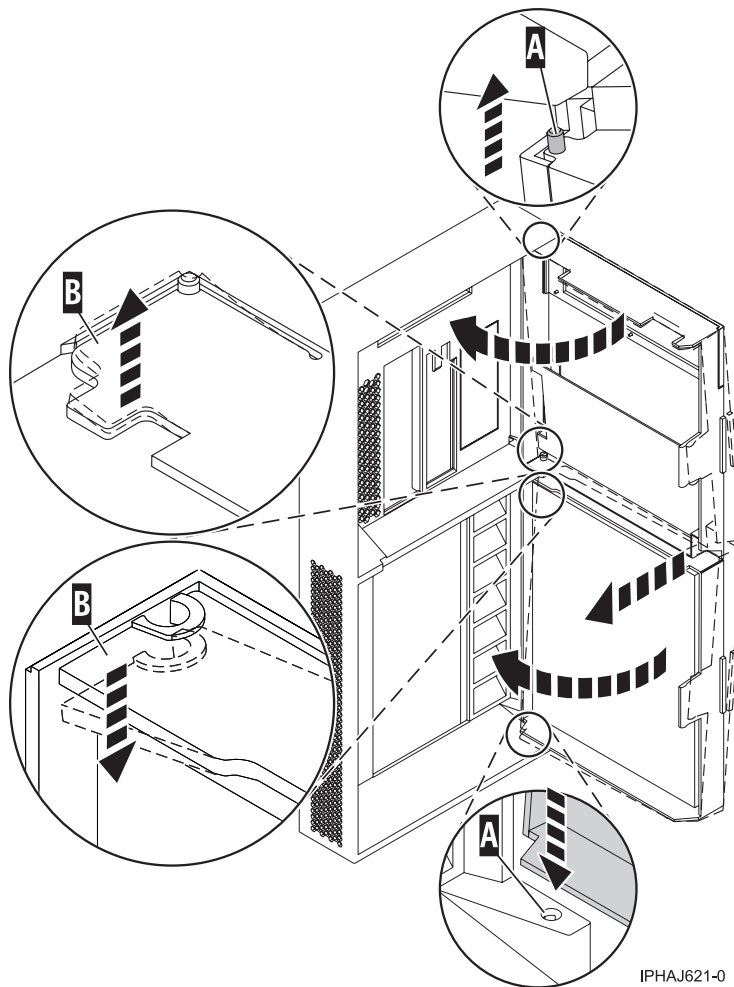


Figure 208. Installing the model 285 door

2. Rotate the door toward the system unit.
3. Press down on the back edge of the door, and seat the post B into its matching slot.
4. Close the door.

**Model 285, 51x, 52x, 55x, 710, or OpenPower 720 service access cover:**

You might need to remove and replace the service access cover to perform service or gain access to internal components. Use the instructions in this section to accomplish these tasks.

*Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720:*

You might need to remove the service access cover to perform service or gain access to internal components. Use the instructions in this section to accomplish this task.

**Tip:** Some of the figures in these procedures may not look exactly like the system unit that you have. However, the steps to perform the task are the same.

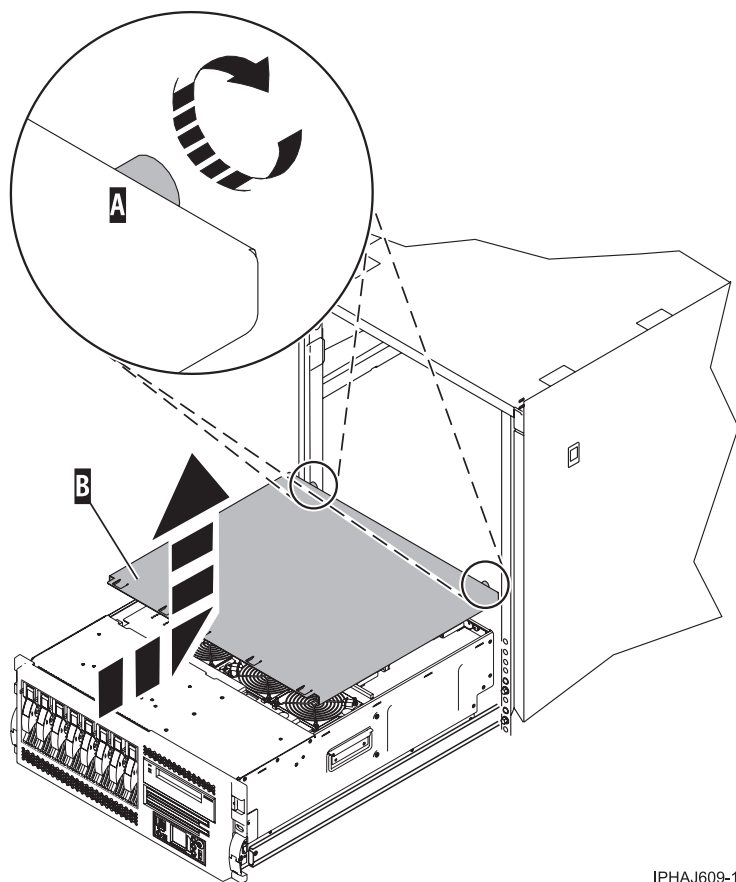
*Remove the service access cover from the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:*

You might need remove the service access cover to perform service or gain access to internal components. Use the procedure in this section to accomplish this task.

To remove the service access cover from a rack-mounted model follow these steps:

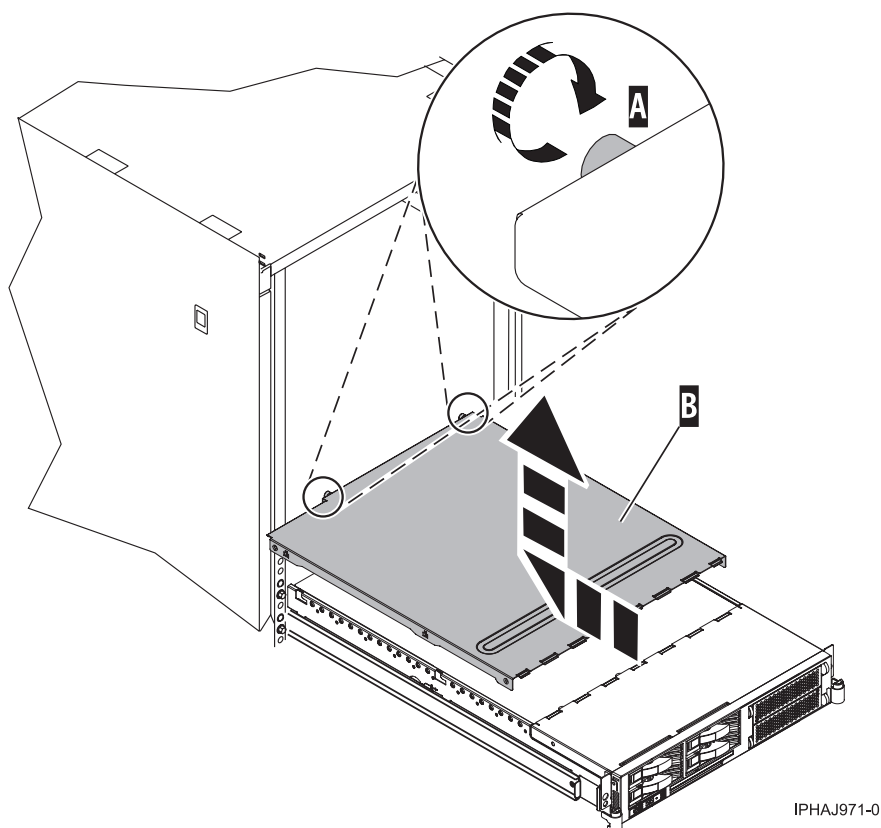
1. "Place the rack-mounted system or expansion unit in the service position" on page 392.
2. Loosen the two thumbscrews located at the back of the cover.
3. Slide the cover toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

**Attention:** For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.



IPHAJ609-1

*Figure 209. Remove the service access cover*



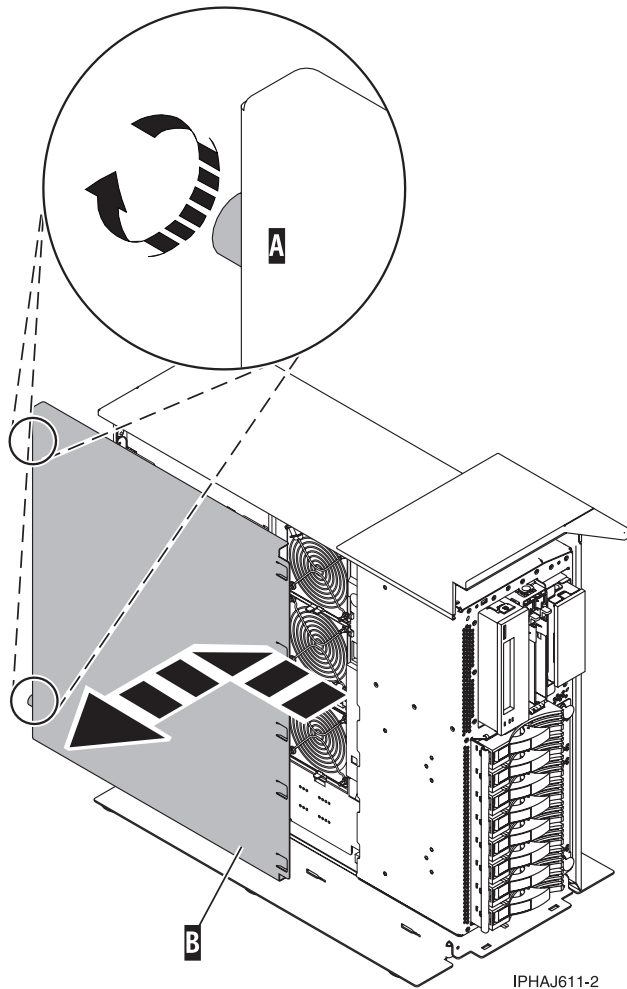
*Figure 210. Remove the service access cover*

*Remove the service access cover from the stand-alone model 285, 52x, 55x, or OpenPower 720:*

You might need remove the service access cove to perform service or gain access to internal components. Use the procedure in this section to accomplish this task.

To remove the service access cover from a stand-alone model do the following:

1. Loosen the two thumbscrews located at the back of the service access cover as shown in the following figure.



- Slide the service access cover toward the back of the system unit. When the front of the cover clears the front frame ledge, lift the cover off the system unit.

**Attention:** For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.

*Install the service access cover on the rack-mounted model 505:*

You might need to install the service access cover after performing service or accessing internal components. Use the procedure in this section to perform this task.

To install the service access cover on a rack-mounted model and follow these steps:

- Ensure that the service access panel C is open while installing the service access cover.
- Place the service access cover A on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit, as shown in the following figure.
- Hold the service access cover against the system unit, and slide it toward the front of the system. Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward.

The tabs on the service access cover slide beneath the upper chassis ledge, and the thumbscrew aligns with the screw hole at the back of the system unit.

- Tighten the thumbscrew B located at the back of the cover.

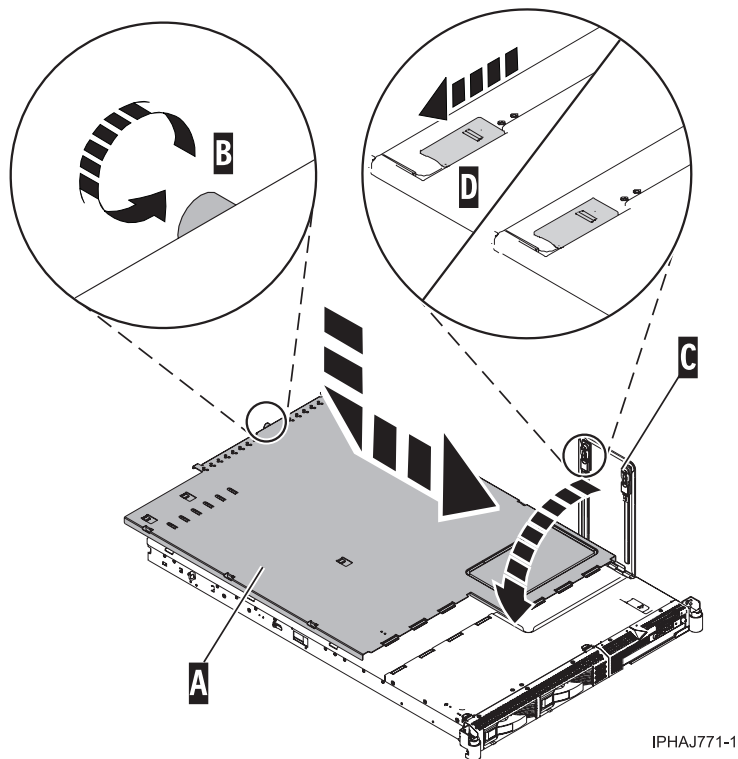


Figure 211. Install the service access cover on the rack-mounted model

5. Close the service access panel **C** and ensure the tabs **D** lock into place.

*Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720:*

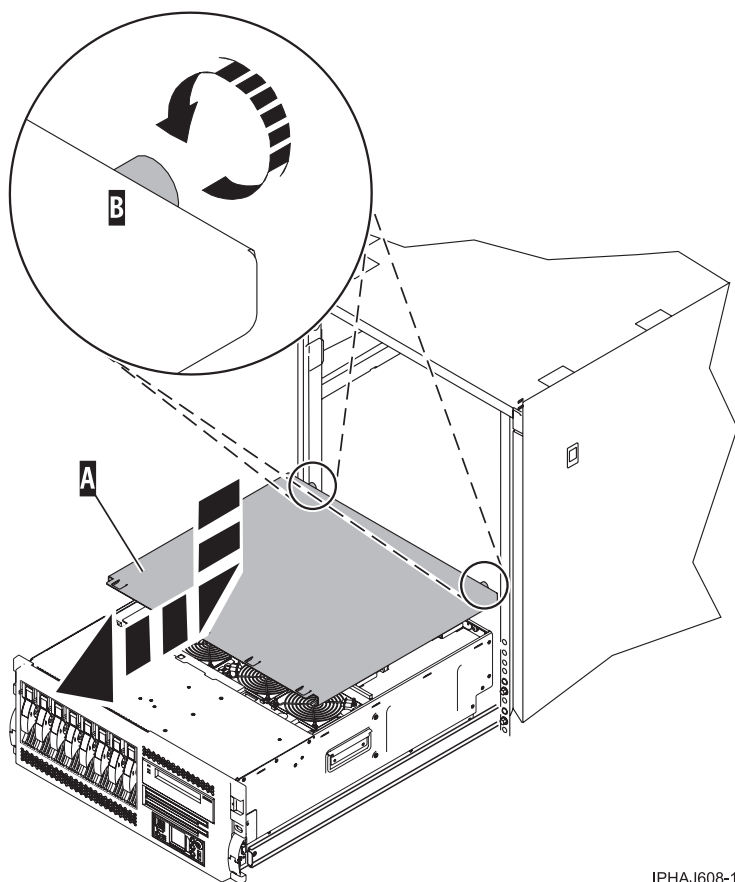
You might need to install the service access cover after performing service or accessing internal components. Use the instructions in this section to accomplish this task for your model.

*Install the service access cover on the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:*

You might need to install the service access cover after performing service or accessing internal components. Use the procedure in this section to perform this task.

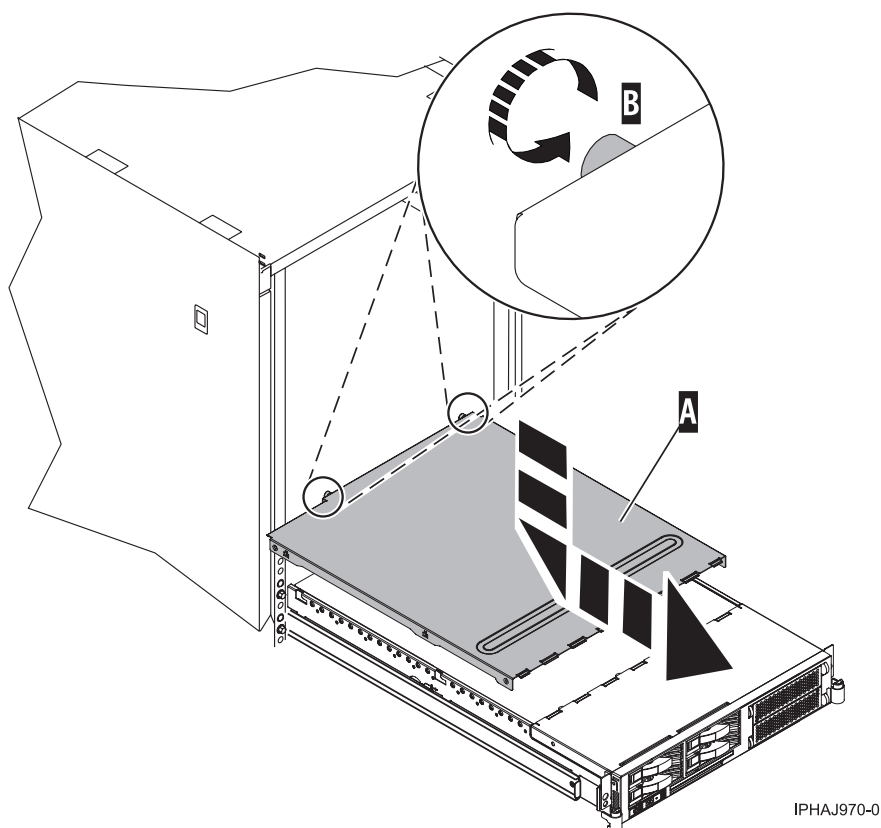
To install the service access cover on a rack-mounted model refer to Figure 212 on page 370 and Figure 213 on page 371, and follow these steps:

1. Place the service access cover **A** on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
2. Hold the service access cover against the system unit, and slide it toward the front of the system. Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward. The tabs on the service access cover slide beneath the upper chassis ledge, and the two thumbscrews align with the screw holes at the back of the system unit.
3. Tighten the thumbscrews **B** located at the back of the cover.



IPHAJ608-1

*Figure 212. Install the service access cover on the rack-mounted model*



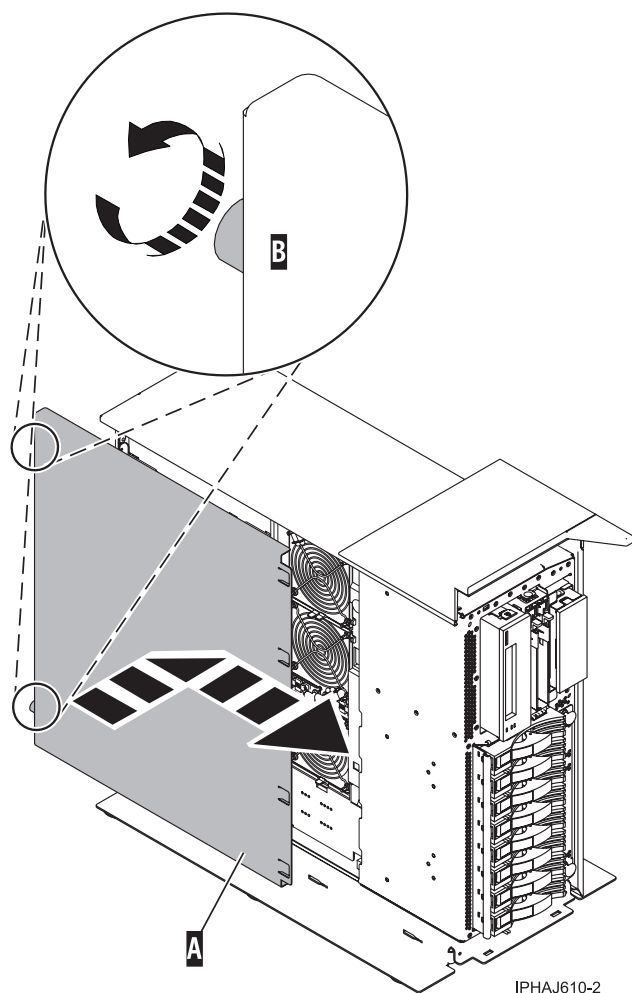
*Figure 213. Install the service access cover on the rack-mounted model*

*Install the service access cover on the stand-alone model 285, 52x, 55x, or OpenPower 720:*

You might need to install the service access cover after performing service or accessing internal components. Use the procedure in this section to perform this task.

To install the service access cover on a stand-alone model follow these steps:

1. Align the service access cover pins with the slots in the system. The flanges on the top and bottom of the cover wrap around the system frame, as shown in the following figure.
2. Hold the service access cover against the system unit **A** and slide it toward the front of the system.
3. Tighten the two thumbscrews **B** located at the back of the cover.



### Front cover for models 285, 52x, 55x, or OpenPower 720 and the 0595 expansion unit:

You might need to remove or replace covers to access components or perform service. Use the instructions in this section to accomplish these tasks.

*Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit:*

You might need to remove the cover to access components or perform service. Use the procedures in this section to accomplish this task.

*Remove the front cover from the rack-mounted model 285, 52x, 55x, or OpenPower 720 and the 0595 expansion unit:*

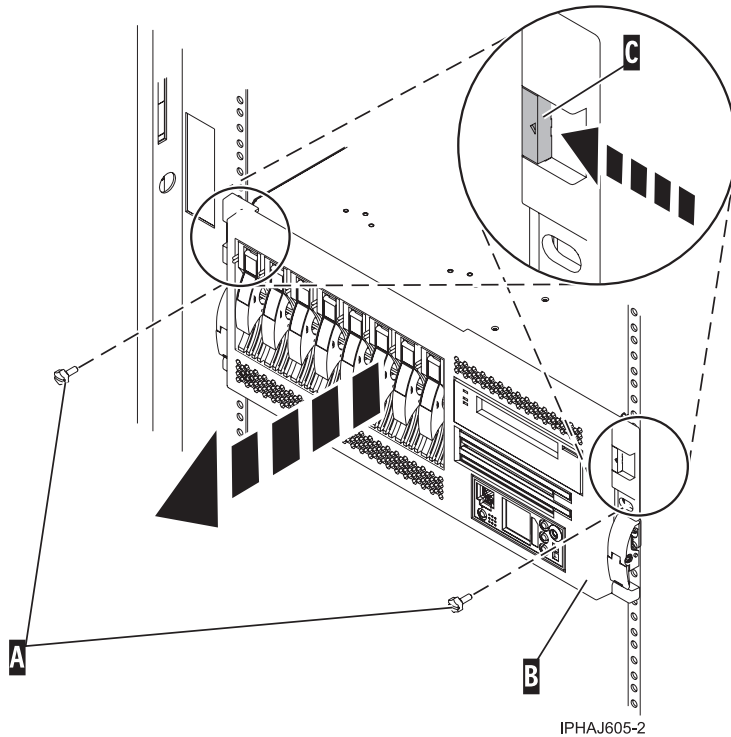
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the rack-mounted system or expansion unit front cover, follow these steps:

1. Open the front rack door.
2. Remove the two thumbscrews **A** that secure the system or expansion unit **B** to the rack as shown in the following figure.
3. Push both cover-release latches **C** in the direction of the arrows to release the cover from the system or expansion unit.



4. Pull the cover out and away from the system or expansion unit.



*Remove the front cover from the stand-alone model 285, 52x, 55x, or OpenPower 720:*

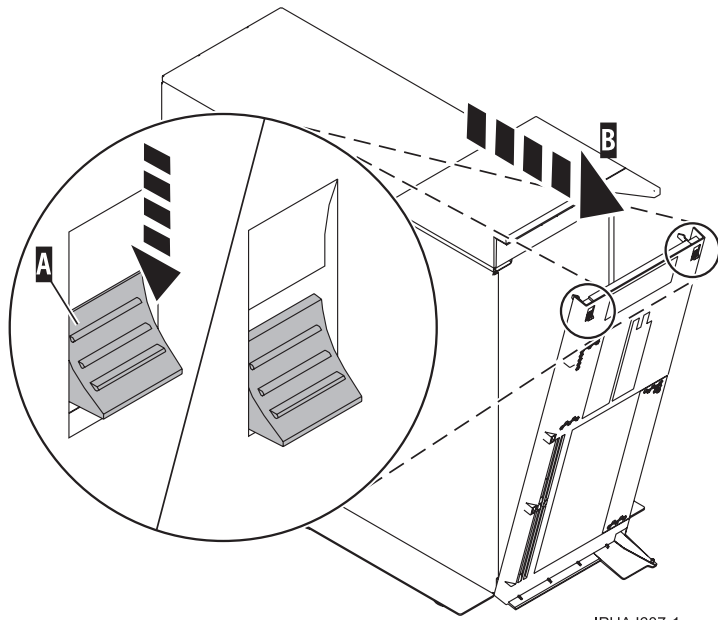
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the stand-alone front cover, follow these steps:

1. "Remove the door from the model 285, 52x, 55x, or OpenPower 720" on page 361.

**Tip:** If you have a large four slot filler in the bottom drive bays you must remove the filler before removing the front cover. You might also wish to remove any fillers in the two bottom drive bays for easier access to the cover.

2. Press down on the two cover-release levers.
3. Pull the top of the cover out and away from the system as shown in the following figure.



IPHAJ607-1

4. Gently pull the cover up and off the base, releasing the lower cover-locking tabs.

*Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit:*

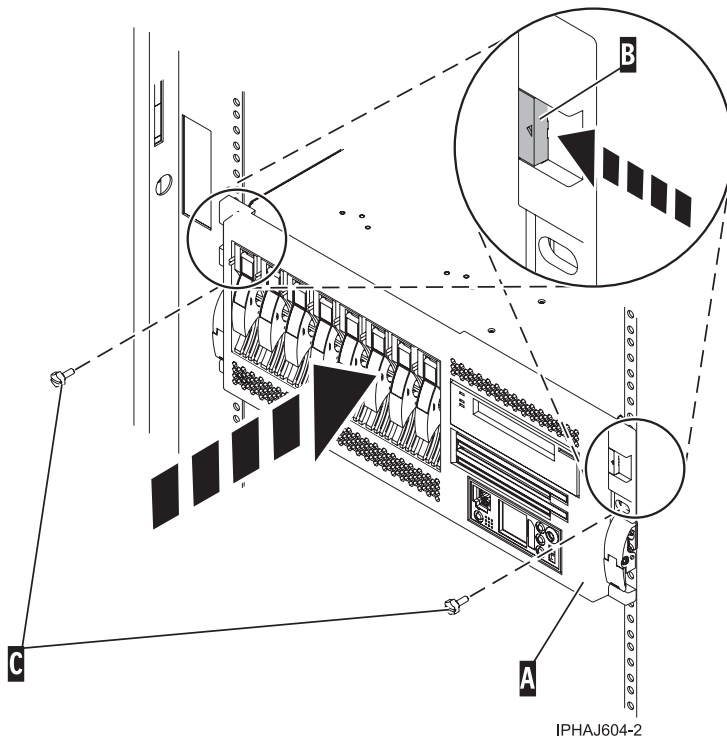
You might need to install the cover after accessing components or performing service. Use the procedures in this section to accomplish this task.

*Install the front cover on the rack-mounted model 285, 52x, 55x, or OpenPower 720, or the 0595 expansion unit:*

You might need to install the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To install the front cover on a rack-mounted model follow these steps:

1. Position the cover on the front of the system or expansion unit so that the two thumbscrews **C** align with the screw holes on the front of the system or expansion unit **A**, as shown in the following figure.
2. Push the cover-release latches **B** in the direction of the arrows to attach the cover to the front of the system or expansion unit. The latches will hold the cover in place.



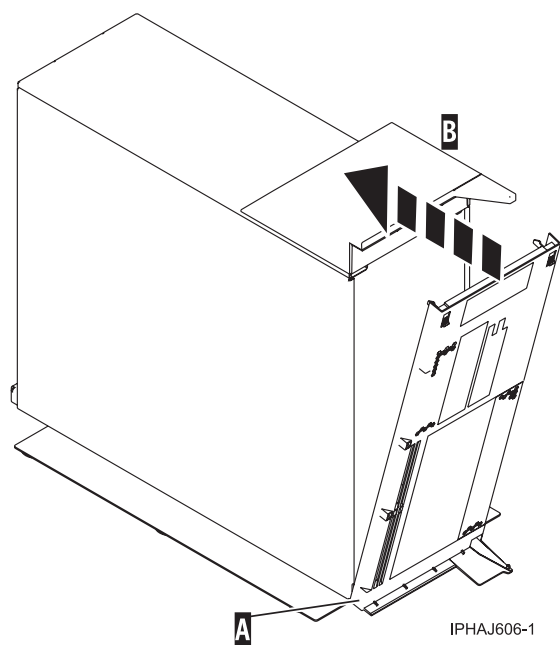
3. Tighten the thumbscrews.
4. Close the front rack door.

*Install the front cover on the stand-alone model 285, 52x, 55x, or OpenPower 720:*

You might need to install the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To install the stand-alone model front cover, follow these steps:

1. Place the two lower cover-locking tabs into the retaining slots located on the base of the system unit as shown in the following figure.



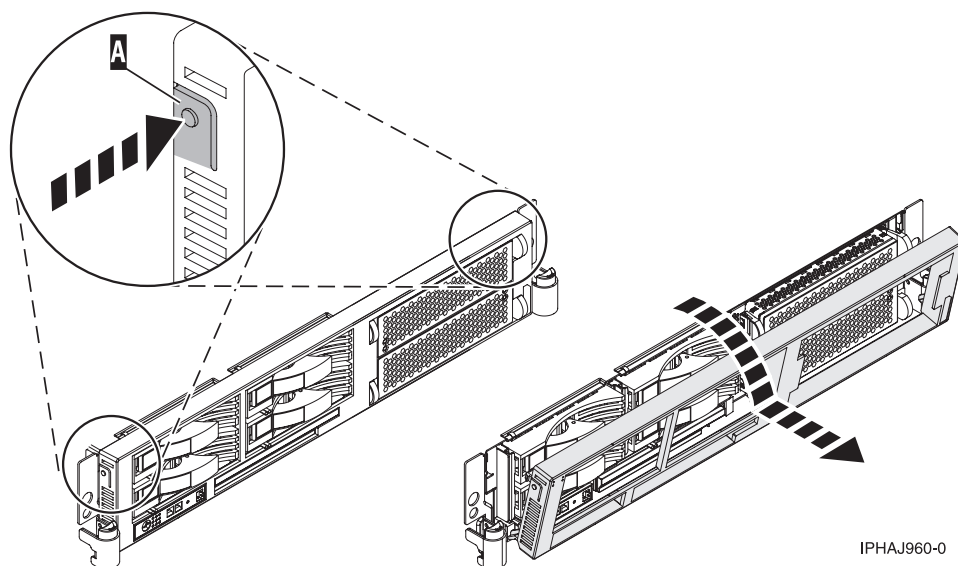
2. Rotate the cover up toward the top of the system, ensuring that the aligning pins are aligned with their matching slots located on the system.
3. Gently push the cover in until the two cover-release levers are seated in their respective slots.
4. "Install or replace the door on the model 285, 52x, 55x, or OpenPower 720" on page 363.

#### Remove the front cover from the model 51x or 710:

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the front cover, follow these steps:

1. If necessary, open the front rack door.
2. Push both cover-release latches **A** down to release the cover as shown in the following figure.



3. Pivot the cover from the bottom and swing the top of the cover out.

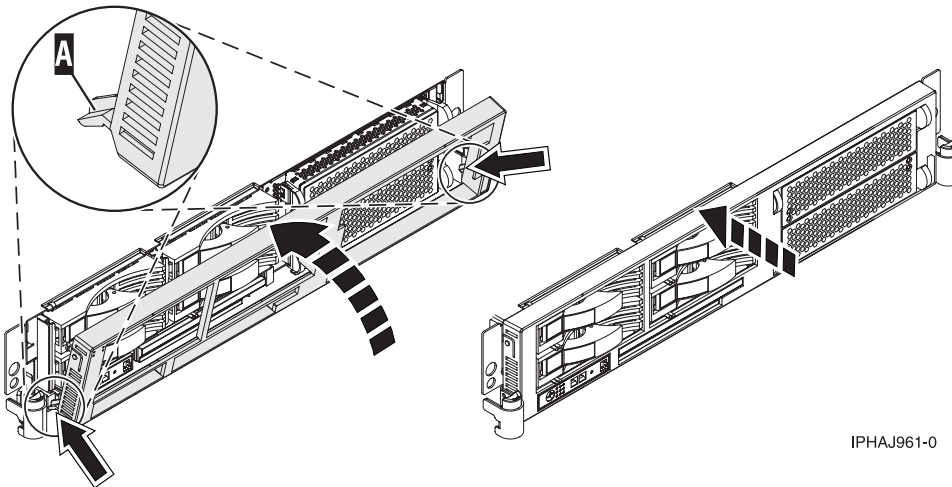
4. Pull the bottom of the cover up and then away from the system unit. This releases the two tabs located on the bottom of the cover.
5. Put the cover in a safe place.

*Install the front cover on the model 51x or 710:*

You might need to install the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To install the front cover, follow these steps:

1. If necessary, open the front rack door.
2. Insert the two tabs **A** located on the bottom edge of the cover into their locking slots, located on the system unit frame as shown in the following figure.



3. Pivot the front cover up toward the top of the system unit frame.
4. Align the tabs to the matching slots located on the front of the system unit frame.
5. Gently push the tabs into the slots until the cover seats against the front of the system unit.
6. Close the front rack door.

**Place the model 51x or 710 in the service position:**

You might need to place a system into the service position to perform service or gain access to internal components. Use the instructions in this section to perform this task.

**Note:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

## 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)

## DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

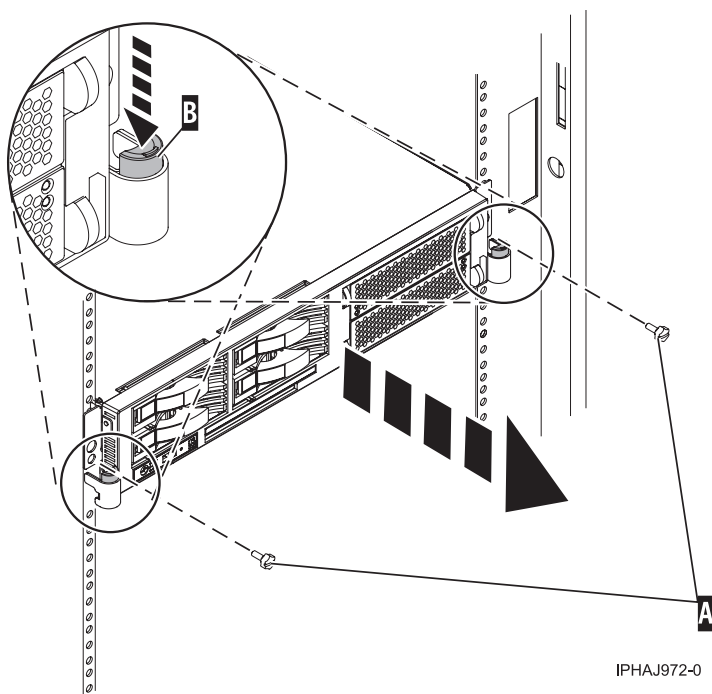
#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

To place the rack-mounted system unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews **A** that secure the system unit to the rack as shown in the following figure.



3. Release the rack latches **B** on both the left and right sides as shown in the previous figure.
4. Review the following note, and then slowly pull the system unit out from the rack until the rails are fully extended and locked.

**Note:**

- If the procedure you are performing requires you to unplug cables from the back of the system unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system unit from being pulled out too far.

**Place the model 51x or 710 in the operating position:**

You might need to place a system into the operating position to make the system available for use. Use the procedure in this section to perform this task.

**Tip:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

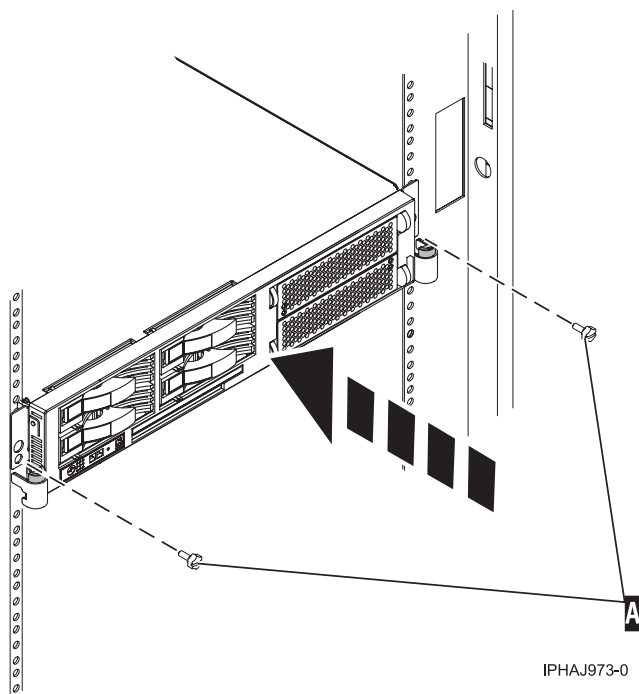
To place the system unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches, located near the middle of each rail, and push the system unit into the rack. Both rack latches should lock into position.

**Important:** Ensure that the cables at the rear of the system unit do not catch or bind as you push the unit back into the rack.

2. Replace and tighten the two thumbscrews **A** that secure the system unit to the rack as shown in the following figure.





3. Close the front rack door.

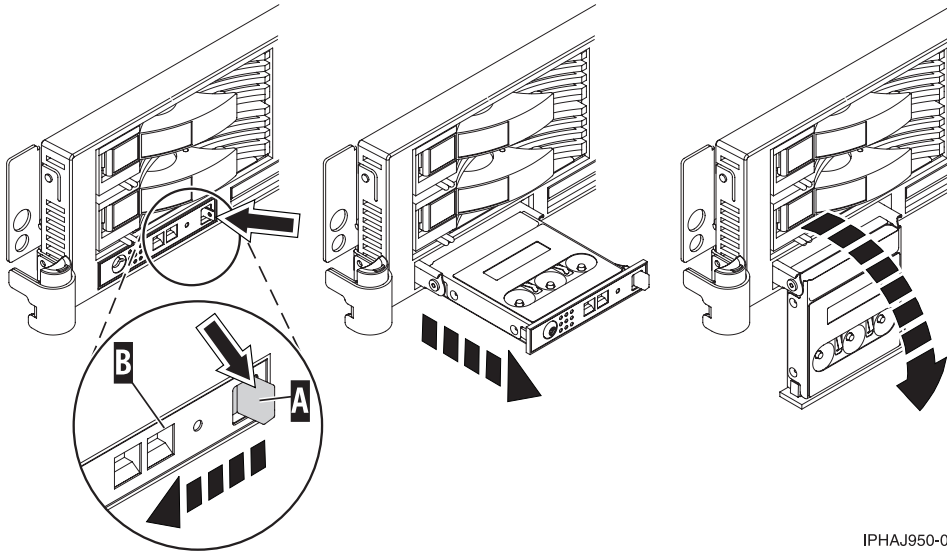
**Gain access to the model 51x and OpenPower 710 control panels:**

Since only part of the control panel is visible from the front of the server, you can use this procedure to gain access to all of the control panel's features, including the display.

Because only part of the control panel is visible from the front of the server, the following procedure describes how to gain access to all of the control panel's features, including the display.

To access all of the control panel's features, complete the following steps:

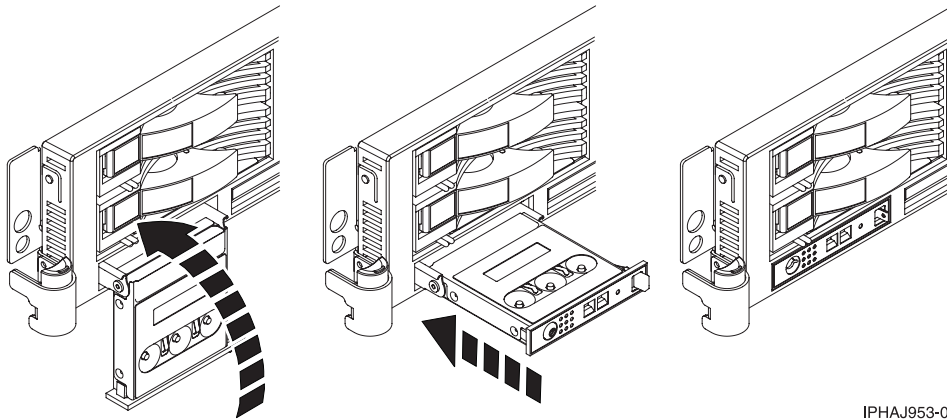
1. Press inward on the spring-loaded tab **A** located on the right side of the control panel **B** so that it pops out slightly, as shown in the following figure.



IPHAJ950-0

Figure 214. Gain access to the control panels

2. Pull the control panel out, toward the front of the system, until it can be pivoted downward on its hinge.
3. To move the control panel back into the device enclosure, lift the control panel up to align it with the opening and push it into place until you feel the tab lock, as shown in the following figure.



IPHAJ953-0

Figure 215. Close the control panels

## Model 570

In the course of installing, removing, or replacing a PCI adapter you might need to perform related procedures such as removing the system unit covers or removing the system unit from a rack. Use the procedures in this section to perform these types of tasks.

### Front cover for the model 9116-561 or 570:

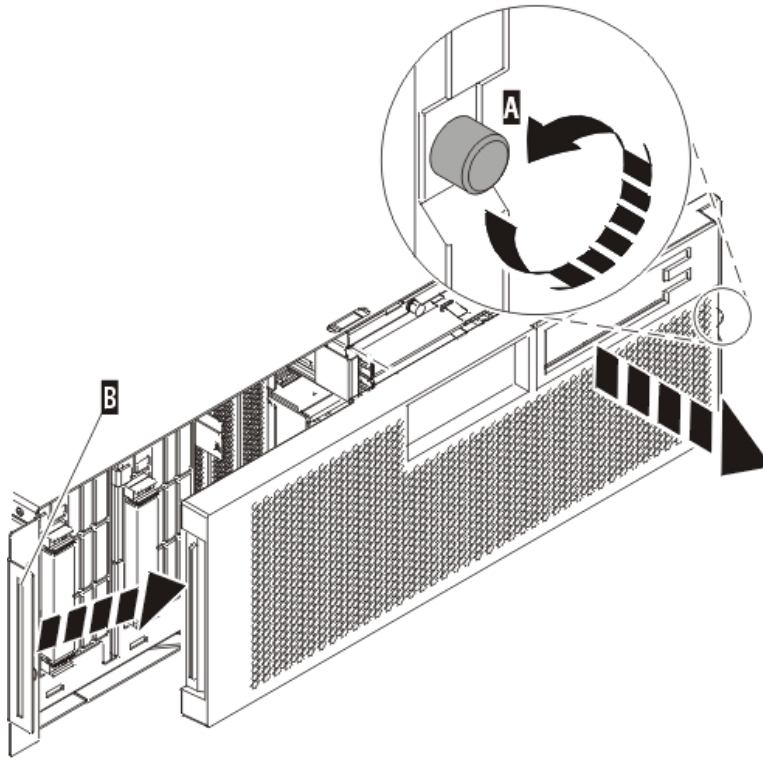
You might need to remove and replace the cover to access components or perform service. Use the procedures in this section to accomplish these tasks.

*Remove the front cover from the model 9116-561 or 570:*

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the front cover follow these steps:

1. If necessary, open the front rack door.
2. Loosen the thumbscrew on the right side of the cover as shown in the following figure.



IPHA1701-1

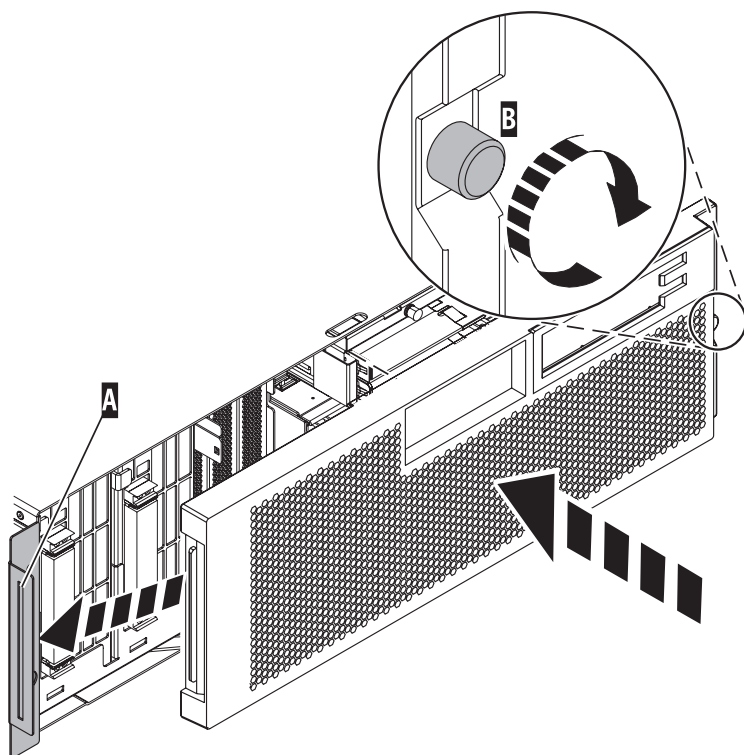
3. Slide the cover to the right and remove it from the system unit.

*Install the front cover on the model 9116-561 or 570:*

You might need to install the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

To install the front cover follow these steps:

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot on the left side of the system unit as shown in the following figure.



IPHAJ500-1

2. Tighten the thumbscrew on the right side of the cover.
3. Close the front rack door.

## Expansion units

In the course of installing, removing, or replacing a PCI adapter you might need to perform related procedures such as removing the expansion units covers or removing the unit from a rack. Use the procedures in this section to perform these types of tasks.

### Expansion unit cover or door:

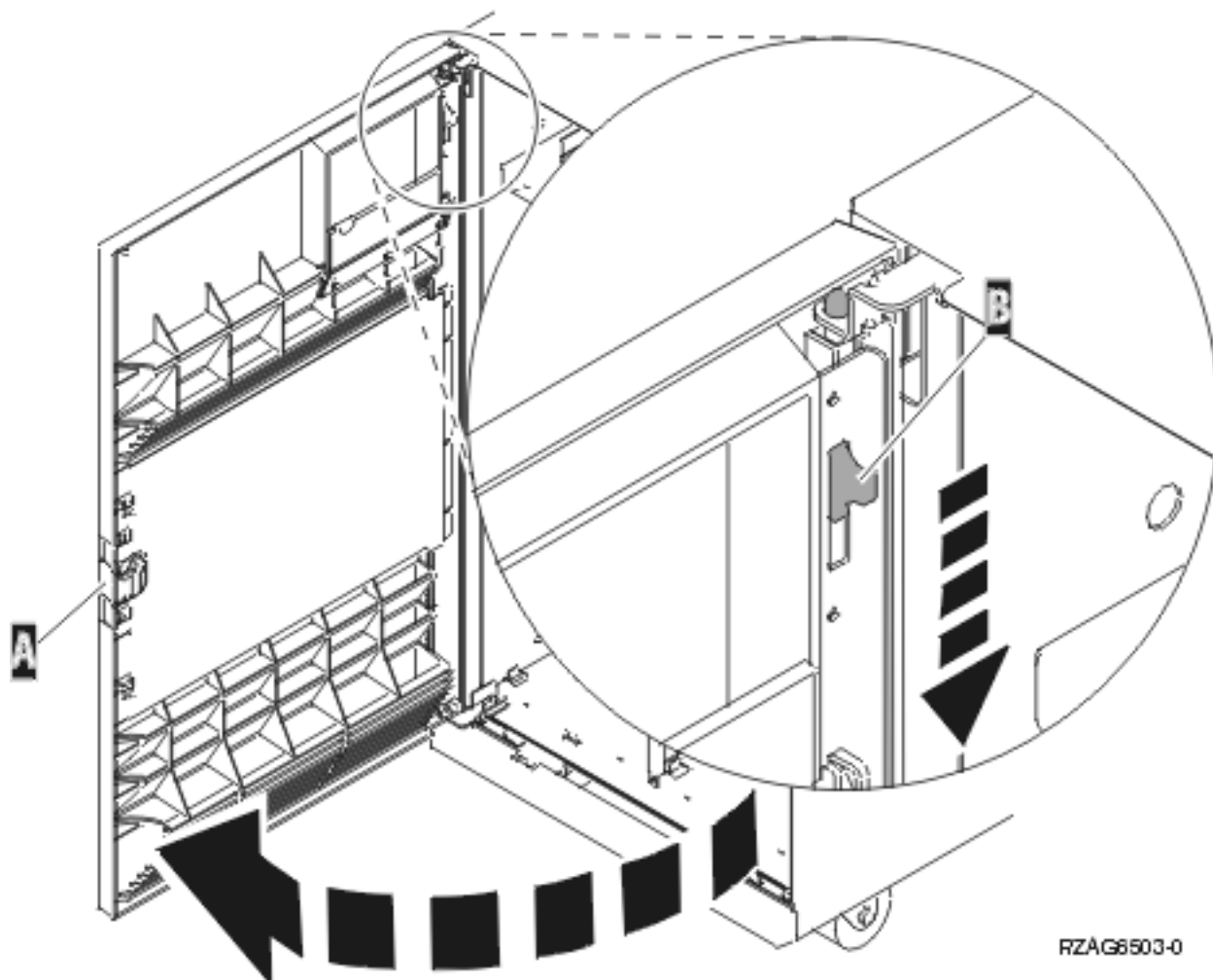
You might need to remove, replace, or install covers or doors on an expansion unit as a part of accessing components or servicing your unit. This section includes instructions to accomplish these tasks.

*Remove the front door from the 5074 or 5094 expansion unit:*

You might need to remove the door to access components or perform service. Use the instructions in this section to accomplish this task.

To remove the front door from the expansion unit, follow these steps:

1. Open the front door **A** as shown in the following figure.
2. Press the latch **B** to remove the door.



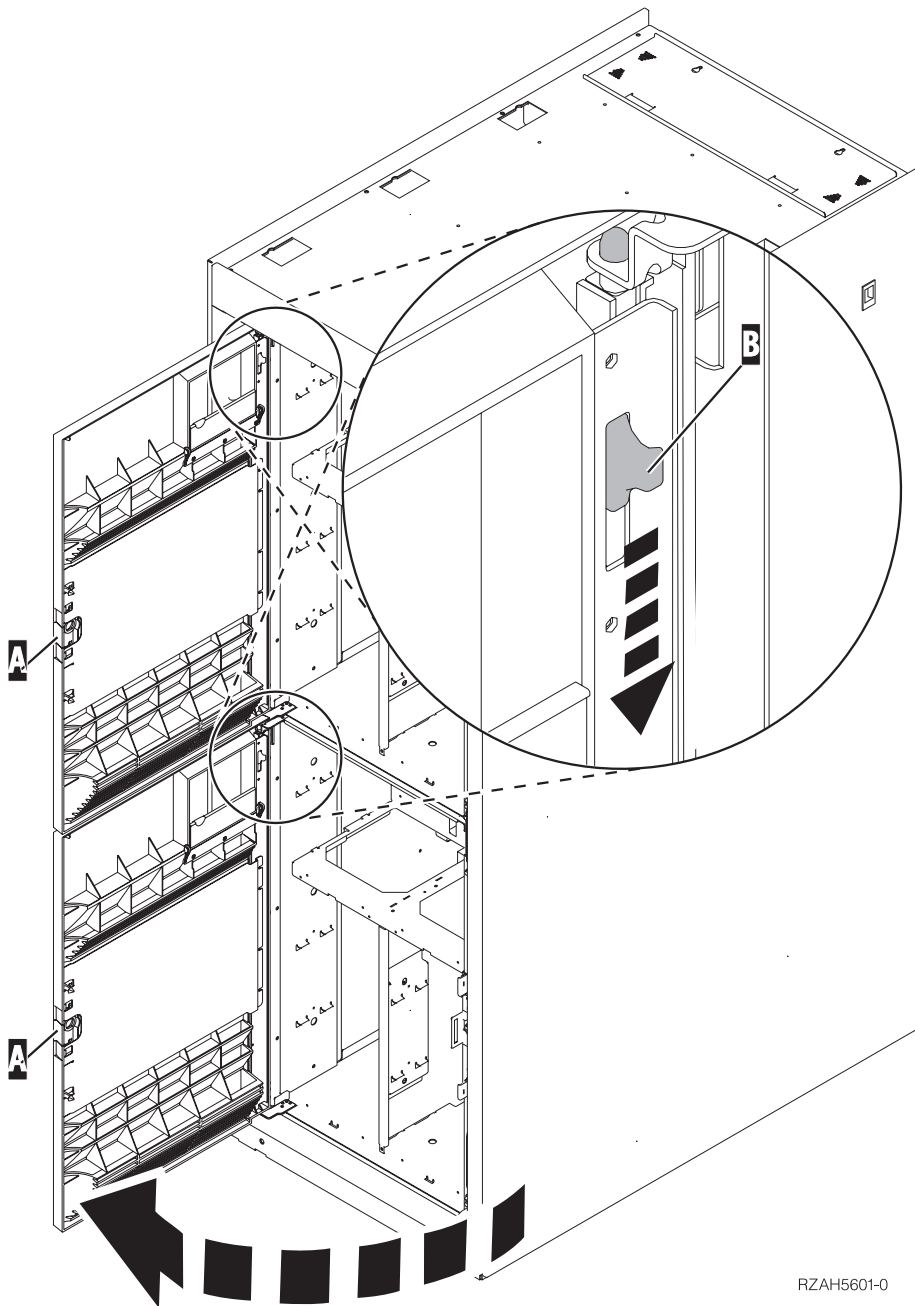
*Figure 216. Removing the expansion unit front door*

*Remove the front door from the 5079 or 5294 expansion unit:*

You might need to remove the door to access components or perform service. Use the instructions in this section to accomplish this task.

To remove the front door from the expansion unit, follow these steps:

1. Open the front door **A** as shown in the following figure.
2. Press the latch **B** to remove the door.



RZAH5601-0

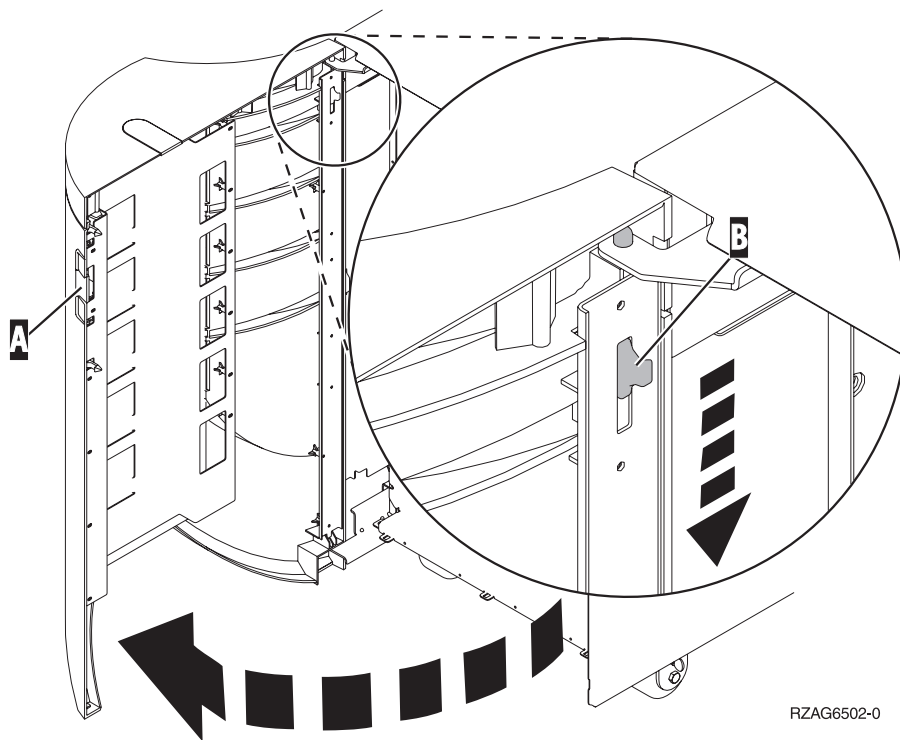
*Figure 217. Removing the expansion unit front door*

*Remove the back door from the 5074, 5079, and 5094 expansion unit:*

You might need to remove the door to access components or perform service. Use the instructions in this section to accomplish this task.

To remove the back door from the expansion unit, follow these steps:

- Open the back door **A** as shown in the following figure.
- Press the latch **B** to remove the door.

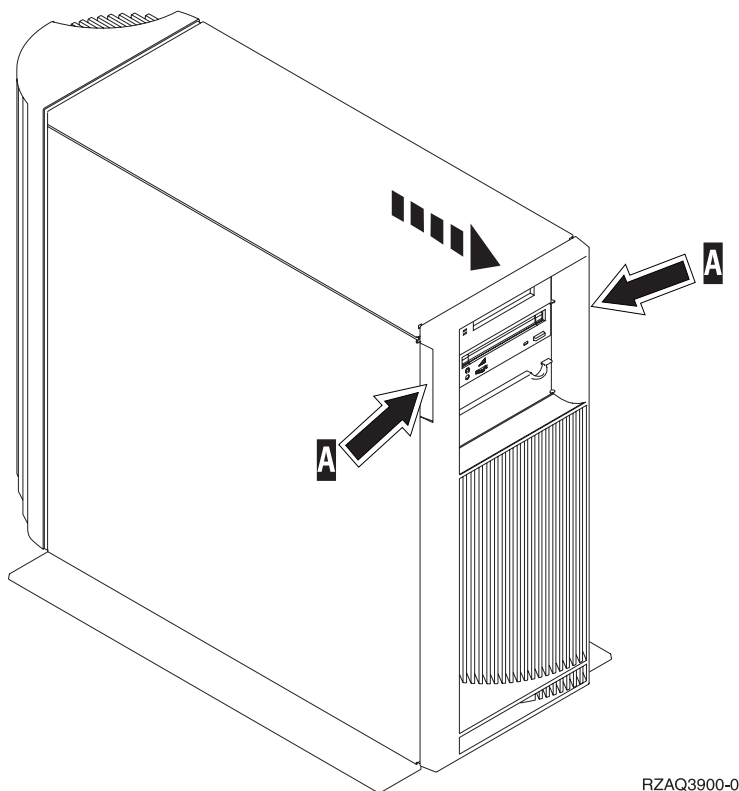


*Figure 218. Removing the expansion unit back door*

*Remove the front cover from the 5095 expansion unit:*

You might need to remove the cover to access components or perform service. Use the instructions in this section to accomplish this task.

To remove the front cover from the expansion unit, grip the sides of the cover **A** and pull the cover toward you, as shown in the following figure.



RZAQ3900-0

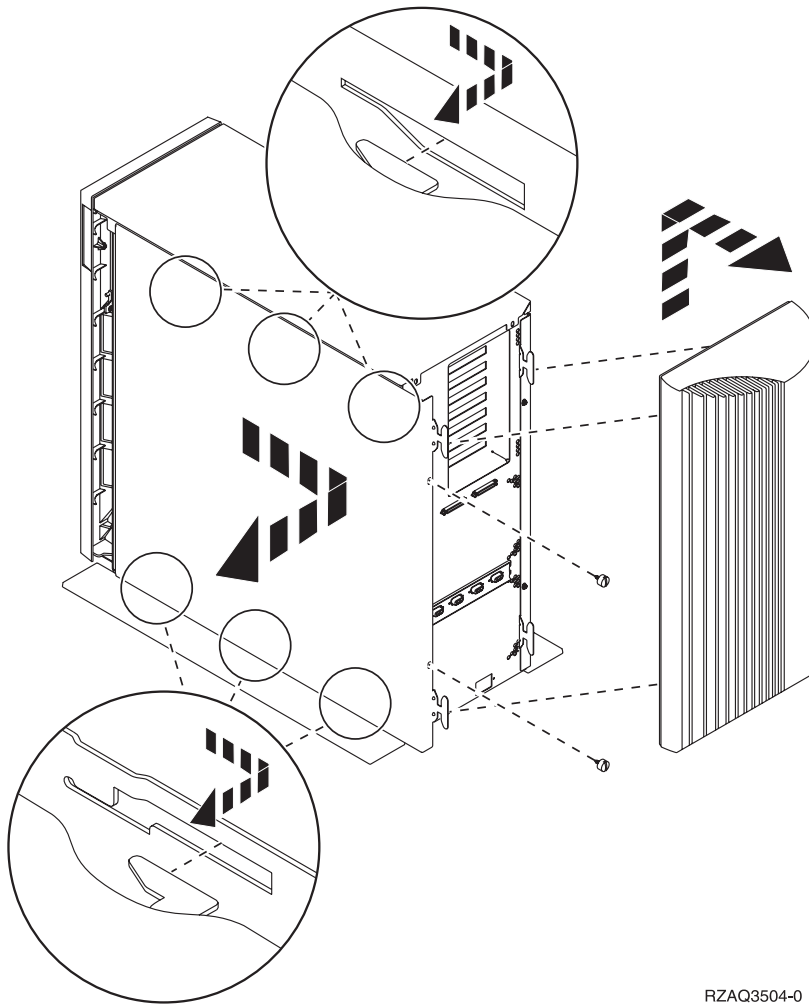
*Remove the back door and cover from the 5095 expansion unit:*

You might need to remove the door and cover to access components or perform service. Use the instructions in this section to accomplish this task.

To remove the back door and cover from the expansion unit, follow these steps:

1. Place your hand near the bottom of the back cover and lift up and out.  
**Attention:** If you remove the cover while the server is powered on, errors might occur due to electromagnetic interference.
2. Remove the left cover, view from back, by loosening the thumbscrews and sliding the cover from front to back until it stops.





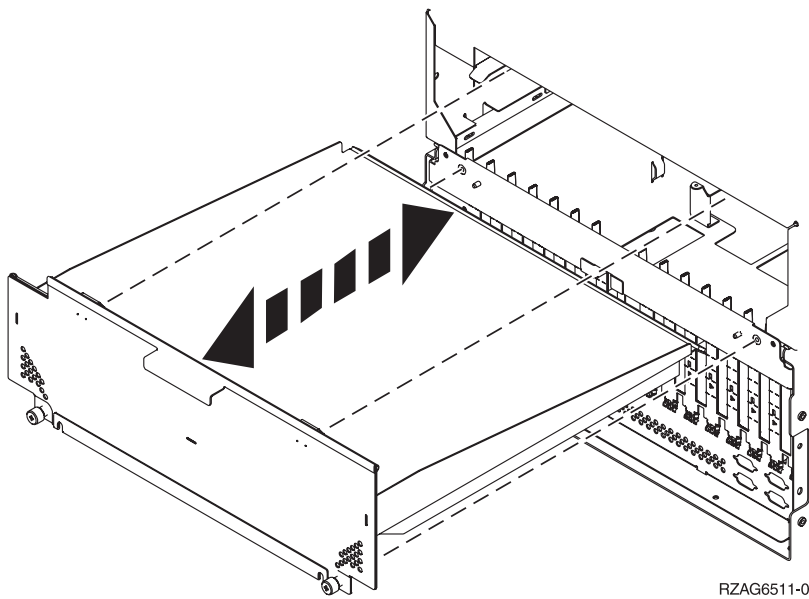
RZAQ3504-0

### 3. Pull the cover out.

*Remove the back cover from the 0588 expansion unit:*

You might need to remove the cover to access components or perform service. Use the instructions in this section to accomplish this task.

Open the back cover and remove the air flow shield, as shown in the following figure.



*Remove and install the front cover on the 5791 or 5794 expansion unit:*

You might need to remove and install the front cover to access components or perform service. This section includes instructions to accomplish these tasks.

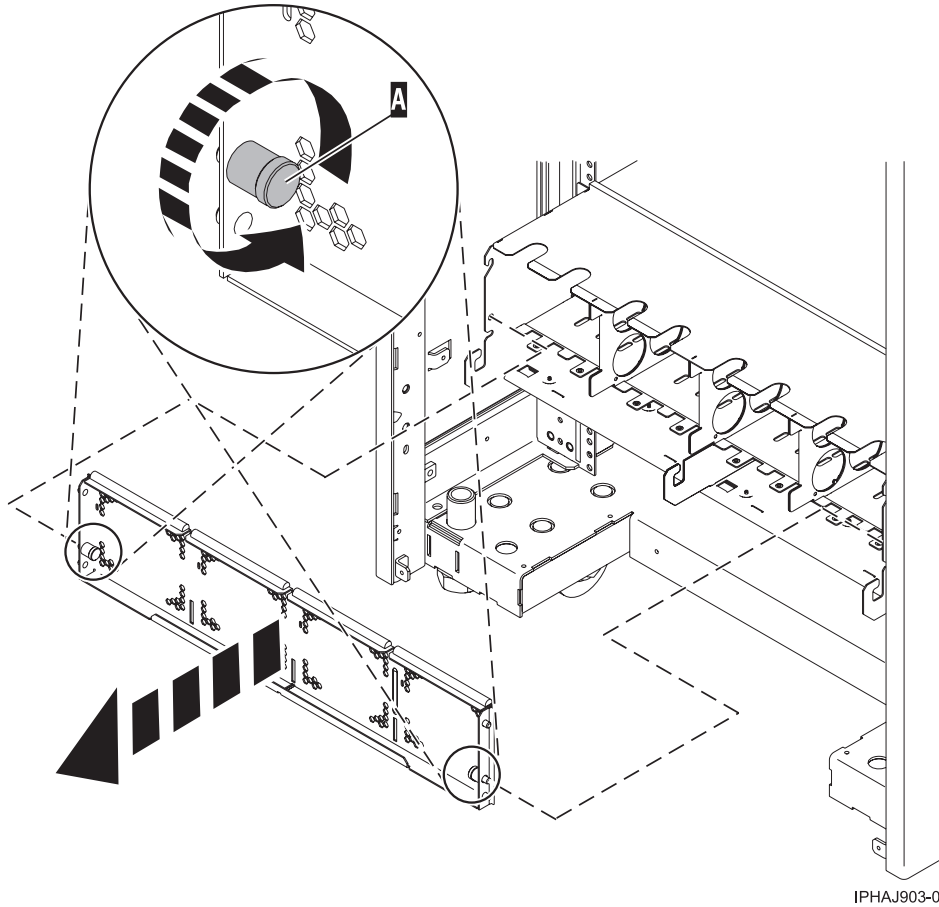
*Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit:*

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the front cover, follow these steps:

1. Open the rack front door, if necessary.

2. Pull in the knobs on the left and right of the front cover as shown in the following figure:



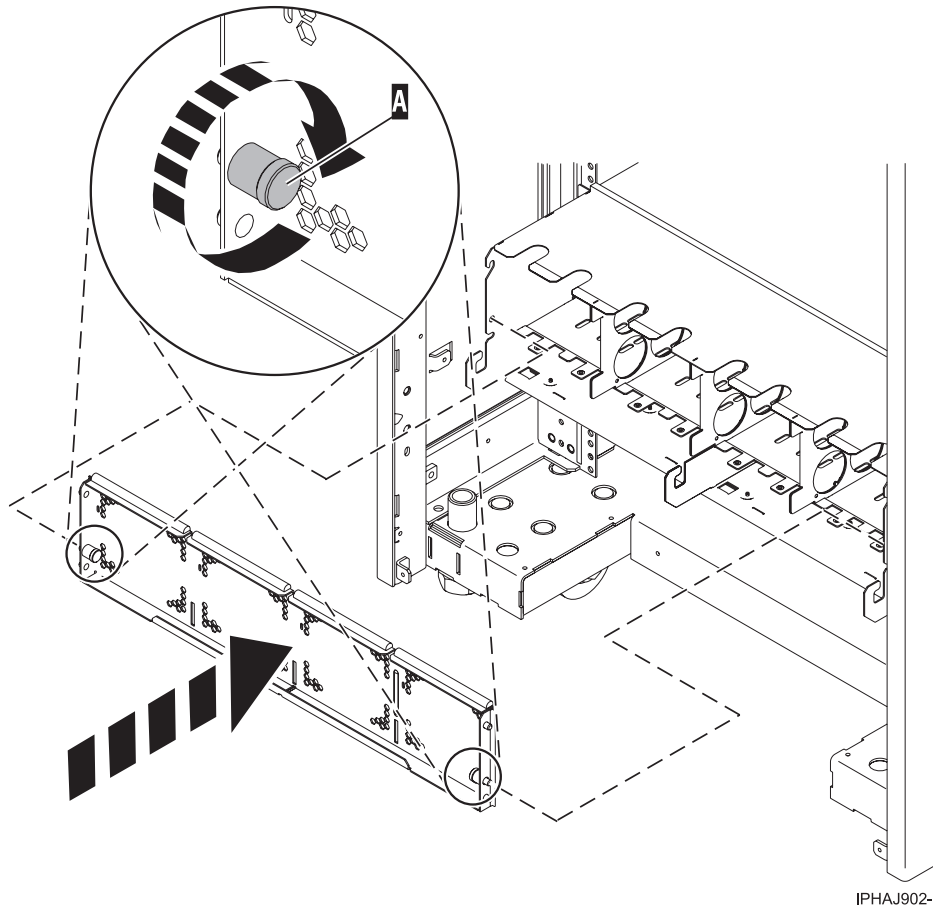
3. Pull the cover out and away from the expansion unit.

*Install the front cover on the 7311-D11, 5791, or 5794 expansion unit:*

You might need to install the cover after accessing components or performing service. Use the instructions in this section to accomplish this task.

To install the front cover, follow these steps:

1. Position the cover on the front of the expansion unit so that the pins on the cover line up with the slots on the front of the expansion unit as shown in the following figure:



2. Pull in the knobs on the left and right of the front cover.
3. Push the cover on to the front of the expansion unit.
4. Release the knobs on the left and right of the front cover.

#### **Open the model 0595, 5095, or D20 service access cover:**

Learn how to open the service access cover to service the system unit.

The following procedure describes how to open the service access cover for the model 0595, 5095, or D20 expansion units.

To open the service access cover, do the following:

1. Ensure the expansion unit in the service position as described in “Place the rack-mounted system or expansion unit in the service position.”
2. Loosen the three thumbscrews located on the cover at the back of the system.
3. Lift the cover into the open position.

#### **Place the rack-mounted system or expansion unit in the service position or operating position**

You might need to place a system or expansion unit into the service position or operating position to perform service or gain access to internal components. Use the instructions in this section to perform these tasks.

#### **Place the rack-mounted system or expansion unit in the service position:**

You might need to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position. Use the procedure in this section to accomplish this task.

**Note:** Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

## **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)

## **DANGER**

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

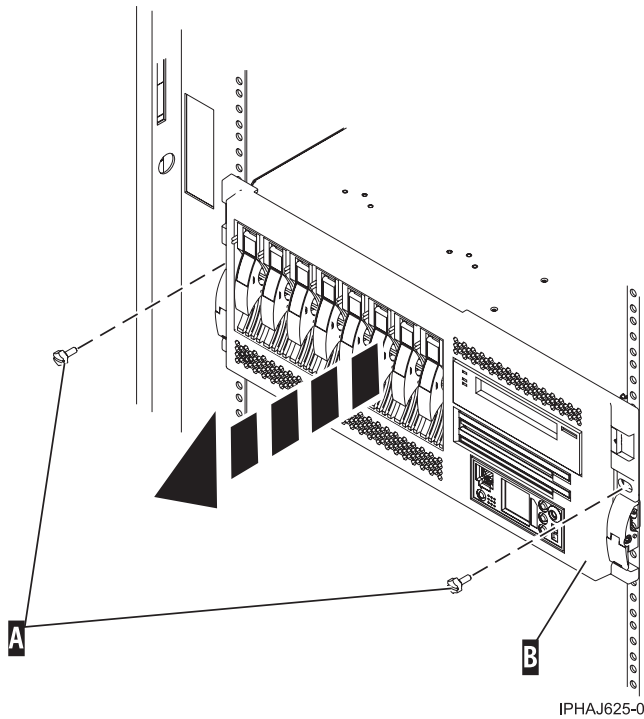
#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

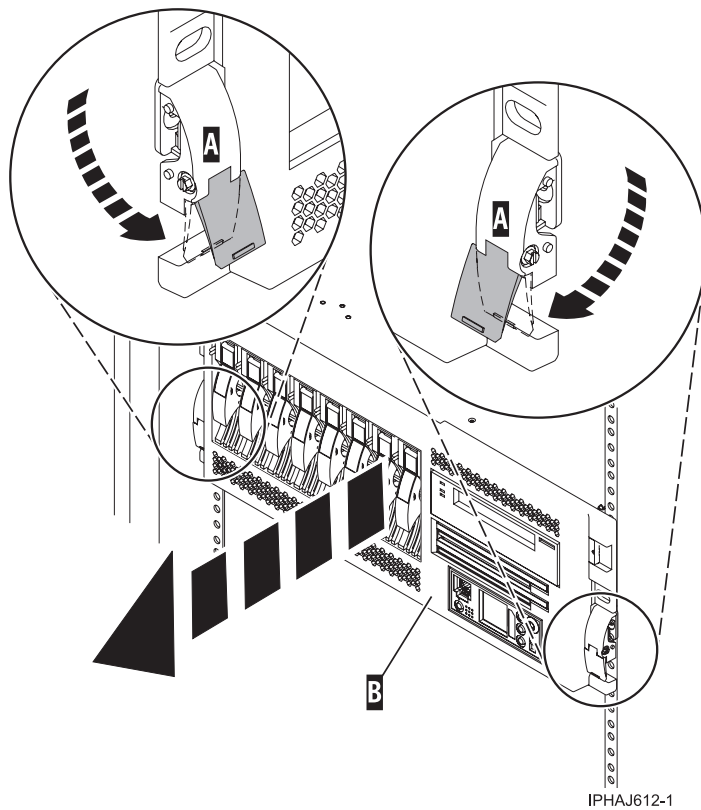
(R001)

To place the rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews **A** that secure the system or expansion unit **B** to the rack as shown in the following figure.



3. Release the rack latches A on both the left and right sides as shown in the following figure.



4. Review the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

**Note:**

- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

### Place the rack-mounted system or expansion unit in the operating position:

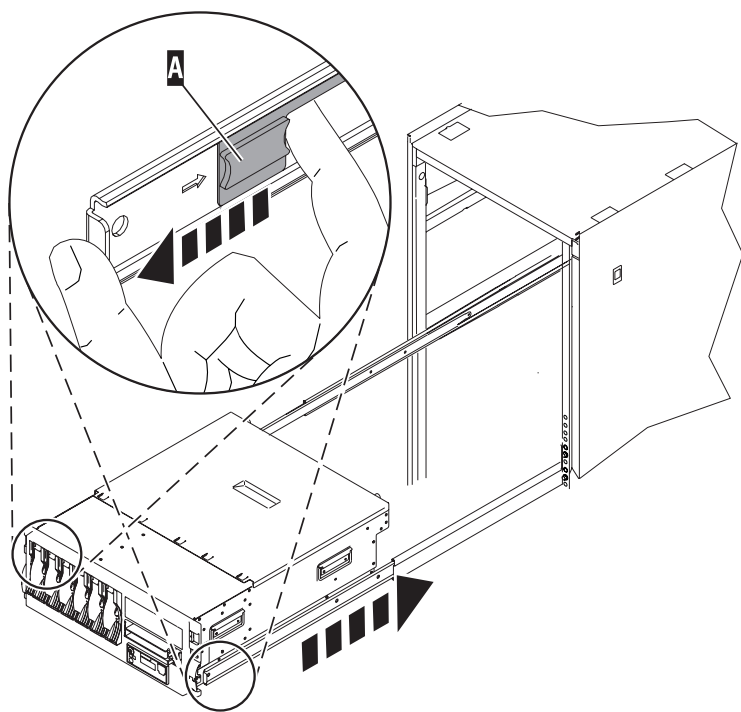
You might need to place the rack-mounted system or expansion unit in the operating position to make the unit available for use. Use the instructions in this section to accomplish this task.

**Tip:** Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system or expansion unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches **A**, located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

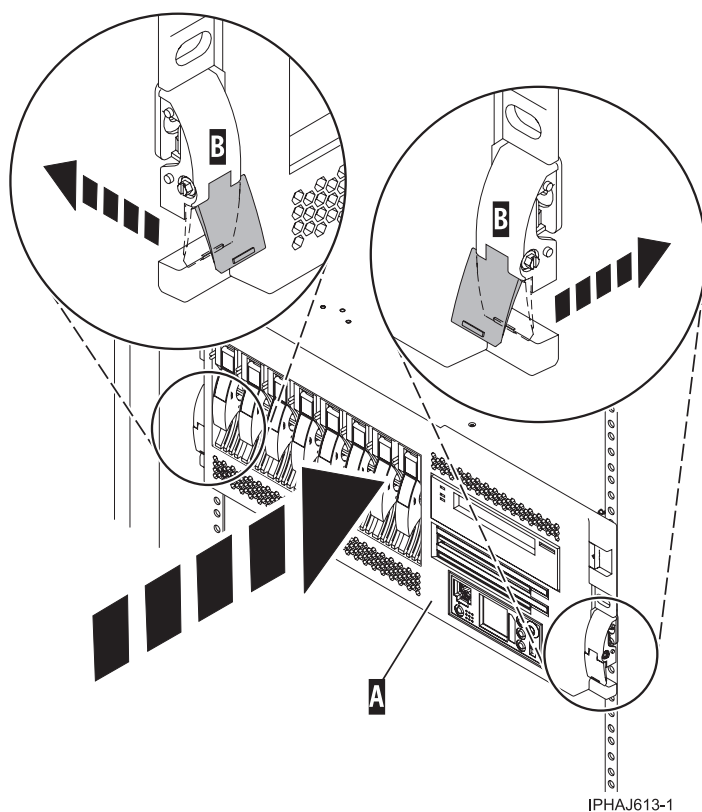
**Note:** Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.



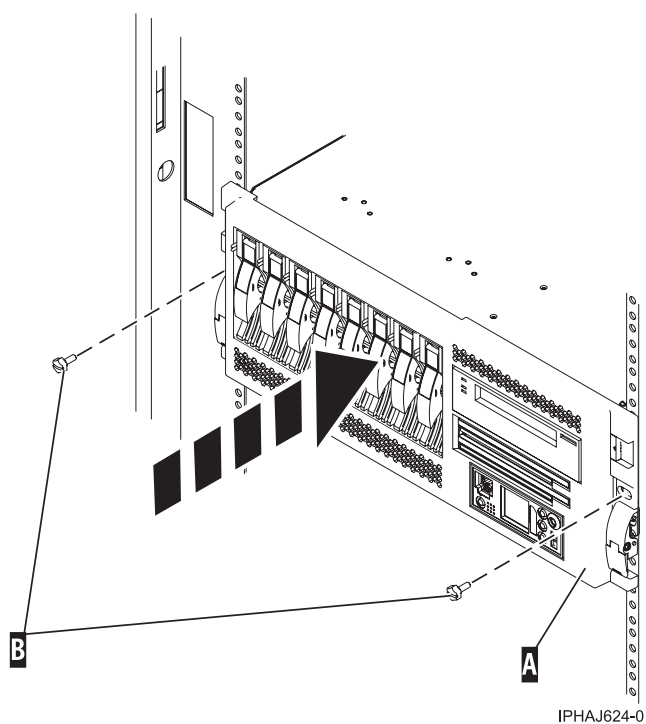
IPHBF509-1

- a. Both rack latches **B** should lock into position as shown in the following figure.





2. Replace and tighten the two thumbscrews **B** that secure the system or expansion unit **A** to the rack as shown in the following figure.



3. Close the front rack door.

## Start or stop the system or logical partition

Learn how to start or stop a system or logical partition.

### Start the system or logical partition:

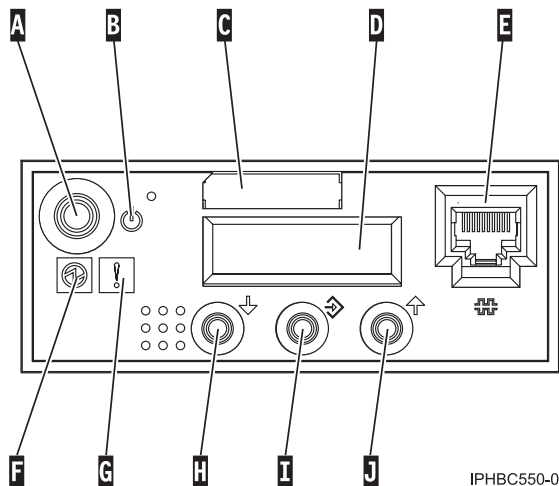
You might need to start a system or logical partition. You can use this procedure to start the system or logical partition.

*Start a system that is not managed by a Hardware Management Console:*

You can use the power button or the Advanced System Management Interface to start a system that is not managed by a Hardware Management Console.

To start a system that is not managed by a Hardware Management Console (HMC), follow these steps:

1. On a rack-mounted system unit, open the front rack door, if necessary. On a stand-alone system unit, open the front door.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:
  - All system power cables are connected to a power source.
  - The power-on light **F**, as shown in the following figure, is slowly blinking.
  - The top of the display **D**, as shown in the following figure, shows 01 V=F.



**Tip:** The system attention light **G**, as shown in the previous figure, does not appear on the control panel on the model 570.

3. Press the power button **A**, as shown in the previous figure, on the control panel.

**Note:** On the OpenPower 710 or model 9110-510, the power button is on the operations panel.

4. Observe the following after pressing the power button:
  - The power-on light begins to blink faster.
  - The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
  - Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

**Tip:** If pressing the power button does not start the system, use the following to start the system using the Advanced System Management Interface (ASMI).

- Set up access to the ASMI. For instructions, see [Accessing the ASMI](#).
- Start the system using the ASMI. For instructions, see [Powering the system on and off](#).

*Start the system or logical partition using the Hardware Management Console:*

You can use the Hardware Management Console (HMC) user interface to start the system or logical partition after the required cables are installed and the power cables are connected to a power source.

For instructions on working with the HMC, see [Managing the Hardware Management Console](#). For instructions on starting a logical partition, see [Activating a partition profile](#). For instructions on starting the system, see [Powering on the managed system](#).

Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

### **Stop the system or logical partition:**

Learn how to stop a system or logical partition.

**Attention:** Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in the data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

To stop the system or logical partition, select the appropriate procedure:

*Stop the system that is not managed by a Hardware Management Console:*

You might need to stop the system to perform another task. Use these instructions to stop the system using the power button or Advanced System Management Interface.

The following procedure describes how to stop a system that is not managed by a Hardware Management Console (HMC).

After you stop the operating system, or if you need to use the control panel power button to power off the system see, [Using the control panel power button to power off](#).

### **Prepare to stop the system**

Before you stop the system, do the following:

1. If an Integrated xSeries Adapter (IXA) is present on the system, shut it down using i5/OS options.
2. Ensure that all jobs are completed and end all applications.
3. Ensure that the operating system is stopped. Failure to do so can result in the loss of data.
4. Record the IPL type and IPL mode from the control panel display to help you return the system to this state when the installation or replacement procedure is completed.
5. Write down the information displayed on the control panel if you are stopping your system due to an error or to make a repair. For more information, see [Collecting reference codes and system information](#).

### **Stop the system**

To stop a system, follow these steps:

1. Log in to the system as a user with the authority to run the shutdown or pwrdownsys (Power Down System) command.
2. At the command line, enter one of the following commands:

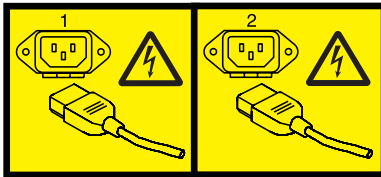
- If your system is running AIX, type **shutdown**.
- If your system is running i5/OS, type **pwrdownsys \*immed**.
- If your system is running Linux, type **shutdown -h now**.

The command stops the operating system. The system power turns off, the power-on light begins to slowly blink, and the system goes into a standby state.

3. Set the power switches of any devices connected to the system to off.
4. Unplug any power cables that are attached to the unit from electrical outlets. Ensure that you unplug power cables from peripheral devices, such as printers and expansion units.

**Important:** The system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

(L003)



or



*Stop the system or logical partition using the Hardware Management Console:*

You can use the Hardware Management Console (HMC) user interface to stop the system or a logical partition. For instructions on stopping the system, see *Powering off the managed system*, or you can also find instructions at

## Identify a failing part

Use the instructions in this section to learn how to locate and identify a failing part on your system or expansion unit using the appropriate method for your system.

### Identify a failing part on an AIX system or logical partition:

Use the instructions in this section to learn how to locate a failing part, and then activate the indicator light for that part on a system or logical partition running AIX.

*Locate a failing part in an AIX system or logical partition:*

You might need to use AIX tools, before activating the indicator light, to locate a part that is failing. Use the procedure in this section to accomplish this task.

1. Log in as root user or celogin-.
2. At the command line, type diag and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the **Display Previous Diagnostic Results** display, select **Display Diagnostic Log Summary**. A **Display Diagnostic Log** display appears. This display contains a chronological list of events.
6. Look in the T column for the most recent S entry. Select this row in the table and press Enter.
7. Choose **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see “Activate the indicator light for the failing part.”

*Activate the indicator light for the failing part:*

You might need to use the indicator light to help you physically locate a part. Use the procedure in this section to accomplish this task.

1. Log in as root user.
2. At the command line, type diag and press Enter.
3. From the **Function Selection** menu, select **Task Selection**. Press Enter.
4. From the **Task Selection** menu, select **Identify and Attention Indicators**. Press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

### Identify a failing part on an i5/OS system or logical partition:

You might need to activate or deactivate the indicator light using i5/OS to assist in locating a failing part. Use the instructions in this section to accomplish these tasks.

*Activate the failing-part indicator light:*

You might need to search the service action log for an entry that matches the time, reference code, or resource of a problem, and then activate the indicator light for a failing part. Use the procedure in this section to accomplish this task.

1. Signed on to an i5/OS session, **with at least service level authority**.
2. 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. Alternatively, if the system is managed by a Hardware Management Console (HMC), use the Service Focal Point utilities to get to the Dedicated Service Tools (DST) display.

3. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

**Remember:** The service tools password is case-sensitive.

4. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
5. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
6. Select **Work with service action log** from the Hardware Service Manager display. Press Enter.
7. On the Select Timeframe display, change the **From: Date and Time** field to a date and time prior to when the problem occurred.
8. Search for an entry that matches one or more conditions of the problem:
  - Reference code
  - Resource
  - Date and Time
  - Failing item list
9. Select option 2, Display failing item information, to display the service action log entry.
10. Select option 2, Display details, to display location information for the failing part to be replaced. The information displayed in the date and time fields is the date and time for the first occurrence of the specific reference code for the resource displayed during the time range selected.
11. If location information is available, select option 6, indicator on, to turn on the failing part's indicator light.

**Tip:** If the failing part does not contain a physical indicator light, a higher-level indicator light will be activated. For example, the indicator light for the backplane or unit that contains the failing part might be lit. In this case, use the location information to locate the actual failing part.

12. Look for the enclosure indicator light to locate the enclosure that contains the failing part.

*Deactivate the failing-part indicator light:*

If you turned on the indicator light during a removal and replacement procedure, turn it off to complete that procedure. Use the instructions in this section to accomplish this task.

1. Select option 7, Indicator off, to turn off the indicator light.
2. If all problems have been resolved, use the **Acknowledge all errors** function at the bottom of the service action log display.
3. Close the log entry by selecting option 8, Close a new entry, on the service action log report display.

### **Identify a failing part on a Linux system or logical partition:**

Use the instructions in this section to learn how to identify a failing part using one of a number of methods on a system or logical partition running Linux.

*Locate a failing part and activate the indicator light:*

If the service aids have been installed on a system or logical partition running Linux, you can use the instructions in this section to locate the failing part, and then activate the indicator light for that part.

*Locate a failing part in a Linux system or logical partition:*

If you do not know the location code of the failing part, use the instructions in this section to locate the failing part.

To locate the failing part in a system or logical partition running Linux, follow these steps:

1. Log in as root user.
2. At the command line, type `grep diagela /var/log/platform` and press Enter.
3. Look for the most recent entry that contains a system reference code (SRC).
4. Record the location information.

*Activate the indicator light for the failing part:*

If you know the location code of the failing part, activate the indicator light to help you locate which part to replace. Use the procedure in this section to accomplish this task.

To activate the indicator light, follow these steps:

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s identify -l<location code>` and press Enter. Substituting the location code of the failing unit for `<location code>`.
3. Look for the system attention light to identify the enclosure that contains the failing part.

*Deactivate the failing-part indicator light:*

After you complete a removal and replacement procedure, use this task to deactivate the failing-part indicator light.

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s normal -l<location code>` and press Enter. Substitute the location code of the failing unit for `<location code>`.
3. Look for the system attention light to identify the enclosure that contains the failing part.

*Identify a failing part using stand-alone eServer diagnostics:*

If the operating system is stopped or if you need to stop the system or logical partition to replace the failing part, use the procedure in this section to identify a failing part.

You can use stand-alone diagnostics to identify a failing part in a Linux system, expansion unit, or logical partition. You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the Network Installation Management (NIM) Server, see *Running the stand-alone eServer diagnostics from a Network Installation Management server*.

#### **Prerequisites:**

- If this server is directly attached to another server or attached to a network, be sure communications with the other servers are stopped.
- Ensure that no other activity is running on the logical partition. Stand-alone eServer diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- You must have access to the system console to use stand-alone eServer diagnostics.

To use stand-alone diagnostics from a CD-ROM, follow these steps:

1. Stop all jobs and applications, and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power.

**Note:** The next step starts the server or logical partition from the eServer stand-alone diagnostic CD-ROM. If the CD-ROM or DVD-ROM drive is not available as the startup device on the server or logical partition on which you are working, follow these steps:

- a. Access the Advanced System Management Interface (ASMI). See Managing your server using the Advanced System Management Interface for information on using the ASMI.
  - b. On the ASMI main menu, click **Power/Restart Control**.
  - c. Click **Power On/Off System**.
  - d. Select the **Service mode boot** from **default boot list** option in the AIX or Linux logical partition mode boot list.
  - e. Click **Save settings** and power on the system. As soon as the optical drive has power, insert the AIX diagnostic diskette.
  - f. Go to step 5.
4. Turn on the system unit power and insert the diagnostics CD-ROM into the CD-ROM drive.
  5. After the keyboard POST indicator displays on the firmware console and before the last POST indicator (speaker) displays, press the 5 key on either the directly attached keyboard or the ASCII terminal. This indicates that a service mode boot should be initiated using the default service mode boot list.
  6. Enter any requested password.
  7. At the Diagnostic Operating Instructions display, press Enter.

**Tip:** If the Diagnostic Operating Instructions display does not appear, contact your support center for assistance.

8. If the terminal type is requested, use the **Initialize Terminal** option on the **Function Selection** menu to initialize the operating system.

#### Identify a failing part using the Advanced System Management Interface:

If the Linux operating system is running on the system or logical partition, use the procedure in this section to identify a failing part.

To activate the indicator light for a failing part, follow these steps:

1. If the unit ID does not match the label on the system or expansion unit, update the configuration information.
  - For information on setting up the ASMI refer to Accessing the Advanced System Management Interface.
  - For information on using the ASMI, refer to Managing your server using the Advanced System Management Interface
2. Turn on the failing part indicator light. For instructions, see Changing service indicators.

#### Verify the installed part

Use the instructions in this section to learn how to verify a newly installed or replaced part on your system, logical partition, or expansion unit by selecting the appropriate procedure for the operating system or console.

#### Verify an installed feature or replaced part on an AIX system or logical partition:

If you installed feature or replaced a part you might want to use the tools in AIX to verify that the feature or part is recognized by the system or logical partition. Use the procedure in this section to accomplish this task.

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:

- Verify the installed feature using AIX
- Verifying the replaced part using AIX

Verify the installed feature using AIX:



1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. Select **Advanced Diagnostics Routines**. Press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
5. When the **Advanced Diagnostic Selection** menu appears, do one of the following:
  - To test a single resource, select the resource that you just installed from the list of resources and press Enter.
  - To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
7. Did the diagnostics run to completion and display the message No trouble was found?
  - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. You can learn more about these codes in Reference codes. Review the installation procedures to ensure that the new feature is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system is running in LPAR mode, note the logical partition in which you installed the feature. Contact your service provider for assistance.
  - **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part using AIX

To verify the operation of a newly installed feature or replacement part, follow these steps:

1. Did you replace the part using either AIX or the online diagnostics service aid's concurrent (hot-swap) service operation?
  - No:** Go to step 2.
  - Yes:** Go to step 5 on page 406.
2. Is the system powered off?
  - Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see Performing a slow boot.
  - No:** Go to step 4.
3. Start the system and wait until the AIX operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.
 

Did the AIX login prompt display?

  - **Yes:** Go to step 4
  - **No:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. You can learn more about these codes in the Reference codes. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system does not start or you have no login prompt, see: Problems with loading and starting the operating system.

If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.
4. At the command prompt, type `diag -a` and press Enter to check for missing resources. If you see a command prompt, go to step 5 on page 406.
 

If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:

  - a. Select the resource and press Enter.
  - b. Select **Commit**.

- c. Follow any instructions that are shown.
  - d. If a *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.
  - e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and go to AIX fast-path problem isolation.
  - f. If no SRN is shown, go to 5.
5. Test the part by doing the following:
- a. At the command line, type `diag` and press Enter.
  - b. From the **Function Selection** menu, select **Advanced Diagnostics Routines**. Press Enter.
  - c. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
  - d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced, and any devices that are attached to the part you replaced. Press Enter.
- Did the **Resource Repair Action** menu appear?
- No:** Go to step 6.
- Yes:** Go to step 7.
6. Did the *Testing Complete, No trouble was found* message appear?
- **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
  - **Yes:** Select **Log Repair Action**, if not previously logged, from 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`. Press Enter.
- Tip:** This action changes the indicator light for the part from the fault state to the normal state. Go to step 9 on page 407
7. 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 appears. After replacing a part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the AIX error log to indicate that a system-detectable part has been replaced.
- Note:** On systems with a indicator light for the failing part, this changes the indicator light to the normal state.
- Follow these steps:
- a. 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 does not appear on the Resource List, select `sysplanar0`. Press Enter.
  - b. Select **Commit** after you make your selections. Did another *Resource Repair Action* display appear?
- No:** If the *No Trouble Found* display appears, go to step 9 on page 407
- Yes:** Go to step 8.
8. The parent or child of the resource you just replaced may also require that you run the Resource Repair Action option 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 appears. After replacing that part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the AIX error log to indicate that a system-detectable part has been replaced.

**Note:** This changes the indicator light for the part from the fault state to the normal state.

Follow these steps:

- a. From the *Resource Repair Action* menu, select the parent or child of the resource that has been replaced. If the repair action was to reseal a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**. Press Enter.
- b. Select **Commit** after you make your selections.
- c. If the *No Trouble Found* display appears, go to step 9.
9. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
10. Did you do any hot-plug procedures before doing this procedure?
  - No:** Go to step 11.
  - Yes:** Go to step 12.
11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?
  - No:** Contact your service provider. **This ends the procedure.**
  - Yes:** Go to step 12.
12. Are the indicator lights still on?
  - **No. This ends the procedure.**
  - **Yes.** Turn off the lights. See one of the following for instructions:
    - Identify a failing part using stand-alone eServer diagnostics
    - Running the stand-alone eServer diagnostics from a Network Installation Management server
    - Changing service indicators with the ASMI menus

#### Verify the presence of an installed part on an i5/OS system or logical partition:

If you have installed a new feature or part, verify that the system recognizes the feature or part by using the i5/OS system service tools. Use the procedure in this section to accomplish this task.

1. Deactivate the failing item indicator light and close the service action log entry. For instructions, see "Deactivate the failing-part indicator light" on page 402.
2. Be sure you are signed on **with at least service level authority**.
3. 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. Alternatively, if the system is managed by Hardware Management Console (HMC), use the Service Focal Point Utilities to get to the Dedicated Service Tools (DST) display.

4. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

**Note:** The service tools password is case-sensitive.

5. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
6. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
7. Select **Logical hardware resources (buses, IOPs, controllers)** from the Hardware Service Manager display. This option allows you to display and work with logical resources. Logical hardware resources are the functional resources of the system used by the operating system.
8. Press Enter.

When you select one of the options from the Logical Hardware Resources display, you can do the following:

- Display logical hardware resource status
- Display or change logical hardware resource information
- Display associated packaging hardware resources

For more information on collecting information and performing specific functions using the options and function keys from the Logical Hardware Resources display or for details on the symbols that appear next to the Resource Description field, see the online Help information.

#### **Verify the installed part on a Linux system or logical partition (run AIX diagnostics):**

If you have installed a new part, use the instructions in this section to learn how to verify that the system recognizes the part.

To verify the newly installed or replaced part, choose one of the following:

#### **Verify an installed part using the eServer stand-alone diagnostics:**

If you have installed or replaced a part, verify that the system recognizes the new part. Use the procedure in this section to accomplish this task.

You can use stand-alone diagnostics to verify an installed part in a Linux system, expansion unit, or logical partition. You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the Network Installation Management (NIM) server, see *Running the eServer stand-alone diagnostics from a Network Installation Management server*.

#### **Prerequisites**

- If this server is directly attached to another server or attached to a network, be sure communication with the other servers is stopped.
- eServer stand-alone diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- eServer stand-alone diagnostics require access to the system console.

To use stand-alone diagnostics, follow these steps:

1. Stop all jobs and applications and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power. The next step boots the server or logical partition from the eServer stand-alone diagnostics CD-ROM. If the optical drive is not available as the boot device on the server or logical partition on which you are working, follow these steps:
  - a. Access the ASMI. See *Managing your server using the Advanced System Management Interface* for information on using the ASMI.
  - b. On the ASMI main menu, click on **Power/Restart Control**.
  - c. Click on **Power On/Off System**.
  - d. Select the **Service mode boot from default boot list** option in the AIX/Linux logical partition mode boot drop-down menu.
  - e. Click on **Save settings and power on**. As soon as the optical drive has power, insert the eServer standalone diagnostic CD-ROM.
  - f. Go to step 5.
4. Turn on the system unit power and immediately insert the diagnostics CD-ROM into the optical drive.
5. After the **keyboard** POST indicator displays on the system console and before the last POST indicator (**speaker**) displays, press the numeric 5 key on the system console to indicate that a service mode boot should be initiated using the default service mode boot list.
6. Enter any requested password.
7. At the *Diagnostic Operating Instructions* display, press Enter.

**Note:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system will not boot or you have no login prompt go to Problems with loading and starting the operating system.

**Note:** If you received an SRN or any other reference code when you attempted to start the system, you can learn more about these codes in Reference codes.

8. If the terminal type is requested, you must use the **Initialize Terminal** option on the *Function Selection* menu to initialize the operating system before you can continue.
9. From the Function Selection menu, select **Advanced Diagnostics Routines**. Press Enter.
10. From the Diagnostic Mode Selection menu, select **System Verification**. Press Enter.
11. When the Advanced Diagnostic Selection menu appears, select **All Resources**, or test only the part you replaced, and any devices that are attached to the part you replaced, by selecting the diagnostics for the individual part. Press Enter.
12. Did the *Testing Complete, No trouble was found* message appear?
  - **No:** There is still a problem. Contact your service provider.
  - **Yes:** Go to step 13.
13. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
14. If the indicator lights are still on, follow these steps:
  - a. Select **Identify and Attention Indicators** from the *Task Selection* menu to turn off the system attention and indicator lights. Press Enter.
  - b. Select **Set System Attention Indicator to NORMAL** and press Enter.
  - c. Select **Set All Identify Indicators to NORMAL** and press Enter.
  - d. Choose **Commit**.

**Note:** This changes the system attention and identify indicators from the *Fault* state to the *Normal* state.

- e. Exit to the command line.

#### Verify the presence of an installed part using Hardware Management Console (HMC):

If you have installed or replaced a part, use the Hardware Management Console (HMC) to update your HMC records after you have completed a service action on your server. Use the procedure in this section to accomplish this task. If you have reference codes, symptoms, or location codes that you used during the service action, locate the records to use during this procedure.

1. At the HMC, examine the service action event log for any open service action events. See Viewing serviceable events for details.
2. Are there any service action events that are open?
  - No:** If the system attention LED is still on, use the HMC to turn off the LED. See Activating and Deactivating LEDs. **This ends the procedure.**
  - Yes:** Continue with the next step.
3. Record the list of open service action events.
4. Examine the details of the open service action event. Is the error code associated with this service action event the same as you gathered earlier.
  - **Yes:** Continue with the next step.
  - **No:** Choose from the following options:
    - Review the other serviceable events and find one that does match and continue with the next step.

- If the log does not match what you had gathered earlier, contact your service provider.
- 5. Select and highlight the service action event from the Error Associated With This Serviceable Event window.
- 6. Click **Close Event**.
- 7. Add comments for the serviceable event. Include any unique additional information. Click **OK**.
- 8. Did you replace, add, or modify a FRU of the open service action event?
  - **No:** Select the **No FRU Replaced for this Serviceable Event** option and click **OK** to close the service action event.
  - **Yes:** Perform the following steps:
    - a. From the FRU list, select a FRU that you need to update.
    - b. Double-click the FRU and update the FRU information.
    - c. Click **OK** to close the service action event.
- 9. If you continue to have problems, contact your service provider.

#### Verify the presence of an installed part using the Advanced System Management Interface:

If you have installed or replaced a part, verify that the system recognizes the new part and turn off the failing part indicator light. Use the procedure in this section to accomplish this task using the Advanced System Management Interface (ASMI).

For information on accessing up the ASMI, refer to Accessing the Advanced System Management Interface

Use the instructions from Changing service indicators to turn off the indicator light.

#### Install a feature using the Hardware Management Console

You might need to use the Hardware Management Console to install a feature. Use the procedure in this section to perform this task.

- If you are using if you are using an HMC with Version 6 or earlier use the following steps 1
- If you are using a an HMC with Version 7 or later use the steps in the next section “Install a feature using the HMC Version 7 or later” on page 411

1. In the navigation area, expand **Management Environment**.
2. Expand the managed system into which you are installing a feature.
3. Expand **Service Applications**.
4. Select **Service Focal Point**.
5. In the contents area, select **Install/Add/Remove Hardware**.
6. In the **Install/Add/Remove Hardware** window, highlight system or unit into which you are installing a feature.
7. Click **Selected**.
8. From the Selected menu, select **Add FRU**.
9. In the **Enclosure type** field, select the system or expansion unit into which you are installing a feature.
10. In the FRU types for selected enclosure, select the feature you are installing.
11. Click **Next**.
12. Follow the instructions to install the feature.

**Note:** The HMC might open the information center instructions for installing the feature. If so, follow these instructions to install the feature.



### Install a feature using the HMC Version 7 or later

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system you will install the part in.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Add FRU**.
7. In the **Add/Install/Remove Hardware** window select the system or enclosure into which you are installing the feature.
8. Select the type of feature you are installing from the menu and click **Next**.
9. Select the location code for where you will install the feature and click **Add**.
10. Once the FRU is in pending actions click **Launch Procedure** and follow the instructions to install the feature.

**Note:** The HMC might open external instructions for installing the feature. If so, follow these instructions to install the feature.

### Remove a part using the Hardware Management Console

You might need to use the Hardware Management Console to facilitate removing a part from your managed system. Use the procedure in this section to accomplish this task.

- If you are using if you are using an HMC with Version 6 or earlier use the following steps 1.
- If you are using a an HMC with Version 7 or later use the steps in the next section "Remove a part using the HMC Version 7 or later."

To use the Hardware Management Console user interface to remove a part in a system or expansion unit that is managed by a Hardware Management Console (HMC), follow these steps:

1. In the navigation area, expand the **Management Environment**.
2. Expand the managed system in which you are replacing a part.
3. Expand **Service Applications**.
4. Select **Service Focal Point**.
5. In the contents area, select **Install/Add/Remove Hardware**.
6. In the **Install/Add/Remove Hardware** window, click System Processor.
7. From the Selected menu, select **Remove FRU**.
8. In the **Installed enclosure types** field, select the system or expansion unit from which you are removing a part.
9. In the Available FRU types for selected enclosure, select the part you are removing.
10. Click **Next**.
11. Follow the instructions to remove the part.

**Note:** The HMC might open the information center instructions for removing the part. If so, follow these instructions to remove the part.

### Remove a part using the HMC Version 7 or later

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system from which you are removing a part.
4. In the Tasks area expand **Serviceability**.

5. Expand **Hardware**.
6. Select **Remove FRU**.
7. In the **Add/Install/Remove Hardware - Remove FRU, Select FRU Type** window select the system or enclosure from which you are removing the part from the list.
8. Select the type of part you are removing from the menu and click **Next**.
9. Select the location of the part you are removing and click **Add**.
10. Once the part is listed in **Pending Actions** click **Launch Procedure** and follow the instructions to remove the part.

**Note:** The HMC might open external instructions for removing the part. If so, follow these instructions to remove the part.

## Replace a part using the Hardware Management Console

You might need to use the Hardware Management Console to replace a part in your managed system. Use the procedure in this section to accomplish this task.

To use the Hardware Management Console Version 6 or earlier, follow these steps, 1

1. In the navigation area, expand the **Management Environment**.
2. Expand the managed system in which you are replacing a part.
3. Expand **Service Applications**.
4. Select **Service Focal Point**.
5. In the contents area, select **Repair Serviceable Event**.
6. Select the system and click **OK**.
7. In the window, click the problem number for the part you want to replace.
8. Follow the instructions to replace the part.

**Note:** The HMC might open the information center instructions for replacing the part. If so, follow these instructions to replace the part.

## Exchange a part using the HMC Version 7

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system in which you are exchanging a part.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Exchange FRU**.
7. In the **Replace Hardware - Replace FRU, Select FRU Type** window select the system or enclosure in which you will exchange a part from the list.
8. Select the type of part you will exchange from the menu and click **Next**.
9. Select the location code of the part you will exchange from the menu and click **Add**.
10. Once the part is listed in **Pending Actions** click **Launch Procedure** and follow the instructions to exchange the part.

**Note:** The HMC might open external instructions for replacing the part. If so, follow these instructions to replace the part.



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## 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.

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

See the IBM Accessibility Center at <http://www.ibm.com/able/> for more information about the commitment that IBM has to accessibility.



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## Electronic emission notices

### Class A Notices

The following Class A statements apply to the IBM System i models and IBM System p servers with the exception of those that are specifically identified as Class B.

### Federal Communications Commission (FCC) statement

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

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

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

### Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

### Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A respecte est conforme à la norme NMB-003 du Canada.

### European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

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

European Community contact:  
IBM Technical Regulations  
Pascalstr. 100, Stuttgart, Germany 70569  
Tele: 0049 (0)711 785 1176  
Fax: 0049 (0)711 785 1283  
E-mail: tjahn@de.ibm.com

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

## VCCI Statement - Japan

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

## Electromagnetic Interference (EMI) Statement - People's Republic of China

### 声 明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

## Electromagnetic Interference (EMI) Statement - Taiwan

### 警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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

**IBM Taiwan Contact Information:**

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

## Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

## Germany Compliance Statement

### Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

### Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

### **Electromagnetic Interference (EMI) Statement - Russia**

**ВНИМАНИЕ!** Настоящее изделие относится к классу А.  
В жилых помещениях оно может создавать  
радиопомехи, для снижения которых необходимы  
дополнительные меры

### **Class B Notices**

The following Class B statements apply to model 9111-520 (stand-alone version), 9131-52A (stand-alone version), 7047-185 and the 9111-285.

### **Federal Communications Commission (FCC) statement**

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

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

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

### **Industry Canada Compliance Statement**

This Class B digital apparatus complies with Canadian ICES-003.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe B respecte est conforme à la norme NMB-003 du Canada.



## European Community Compliance Statement

This product is in conformity with the protection requirements of EC Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

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

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for an interference caused by using other than recommended cables and connectors.

European Community contact:  
IBM Technical Regulations  
Pascalstr. 100, Stuttgart, Germany 70569  
Tele: 0049 (0)711 785 1176  
Fax: 0049 (0)711 785 1283  
E-mail: tjahn@de.ibm.com

## VCCI Statement - Japan

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをして下さい。

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

This is a Class B product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

## IBM Taiwan Product Service Contact Information

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

## Electromagnetic Interference (EMI) Statement - Korea

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거 지역에서는 물론 모든 지역에서 사용할 수 있습니다.

## Radio Protection for Germany

### Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

### Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse B.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.**

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