



System i and System p
Disk drive





System i and System p
Disk drive

Note

Before using this information and the product it supports, read the information in “Notices” on page 229 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 metallically 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 metallically 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.

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>.

About this topic

This topic provides users with instructions for installing, removing, and replacing a disk drive and a disk-drive backplane or enclosure.

For information about the accessibility features of this product, for users who have a physical disability, see "Accessibility features," on page 227.

Disk Drive

You might need to install, remove, or replace a disk drive, a disk-drive backplane, or an enclosure. You might also need to install, remove, and replace the field replaceable units (FRUs) in the SCSI disk-drive enclosure. This section includes procedures so that you can perform these tasks.

You can choose to perform these tasks yourself, or contact a service provider to perform the task for you. You might be charged a fee by the service provider for this service.

Note: Disk drives are sensitive devices and must be handled with care as follows:

- Avoid any impact to the disk drive.
- Always handle the disk drive by the sides of its carrier.
- Do not touch the circuit connector, or circuit board along the end of the device.

What's new for Capacity on Demand

Learn about new or updated information for the Capacity on Demand information.

Additions and changes were made to the Capacity on Demand feature tables for IBM System p and System i POWER6 models. *Utility CoD*, a new Capacity on Demand offering, has been announced and is now available on the new System i and System p POWER6 MMA.

New HMC Licensed Machine Code (Version 7) is required to manage POWER6 servers and associated Capacity on Demand features. HMC references (with the exception of Utility CoD) in this document are based on Licensed Machine Code (Version 6). For information about managing CoD using Version 7, see the System i and System p Operations Guide for the Hardware Management Console and Managed Systems Version 7 Release 3.1.0.

PDF file for disk drives

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3. Navigate to the directory in which you want to save the PDF.
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Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep2.html) .

Model 7037-A50 or 7047-185 disk drives

You might need to install, replace, or remove a disk drive from the server. This section includes procedures so that you can perform these tasks.

Install or replace disk drive with the system powered off

You might need to install or replace a Small Computer System Interface (SCSI) disk drive in a system with the power off. Use the procedure in this section to perform this task.

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)

Complete the following steps to install or replace a SCSI disk drive.

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.

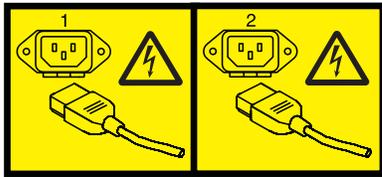
Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.

3. 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.

(L003)



or



4. If necessary, "Place the rack-mounted model 7047-185 or 7037-A50 in the service position" on page 202.
5. Remove the side cover. For instructions, see "Remove and replace model 7047-185 or 7037-A50 covers and doors" on page 183.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
6. Push the drive-cage release tab A up and rotate the drive cage all the way out of the system until it locks into place over the drive-cage retention tab, as shown in the following figure. The open ends of the drive slots and installed drives will face you.

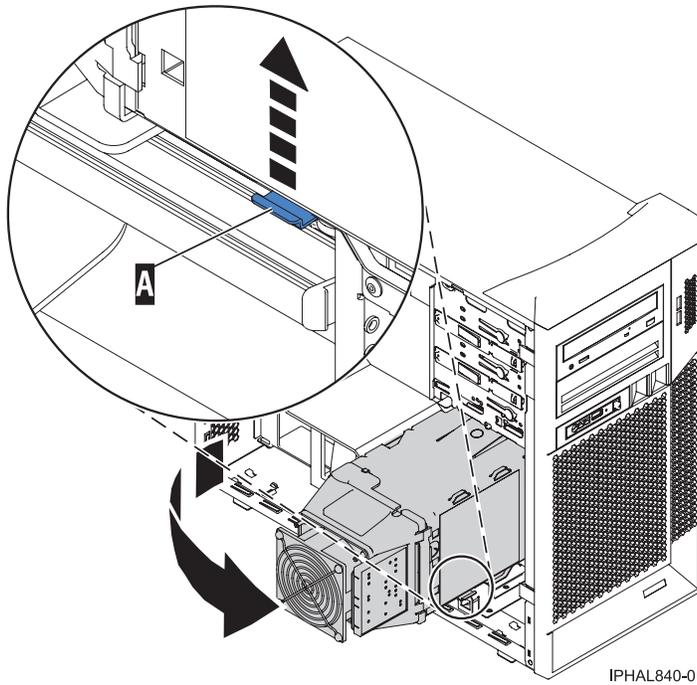


Figure 1. Rotating the drive cage out of the system

7. Slightly pull the fan assembly edge outward to release the tabs and rotate the fan assembly to the side, as shown in the following figure.

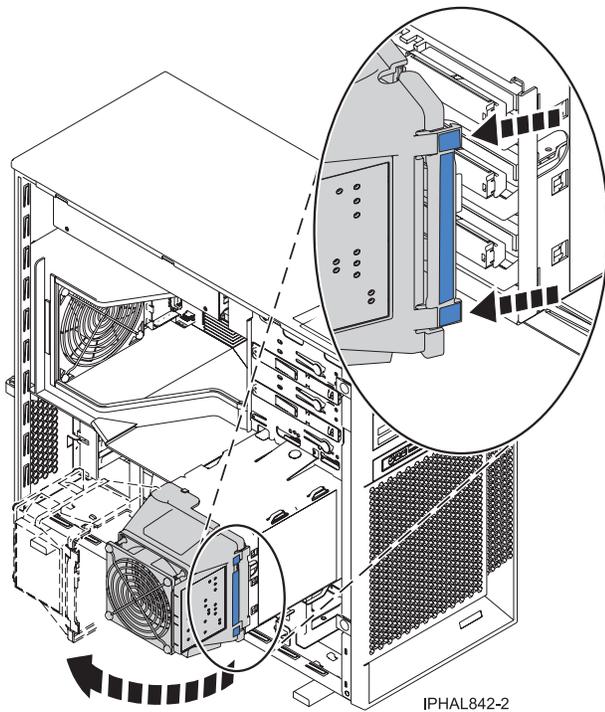
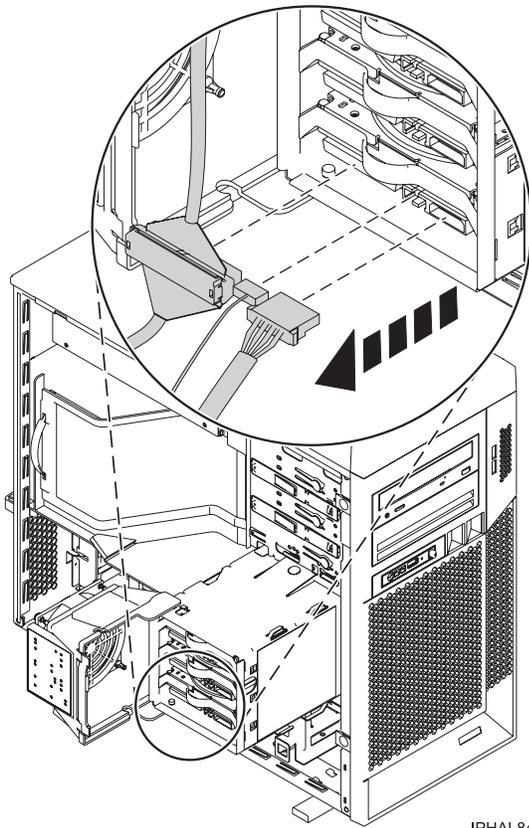


Figure 2. Opening the fan assembly

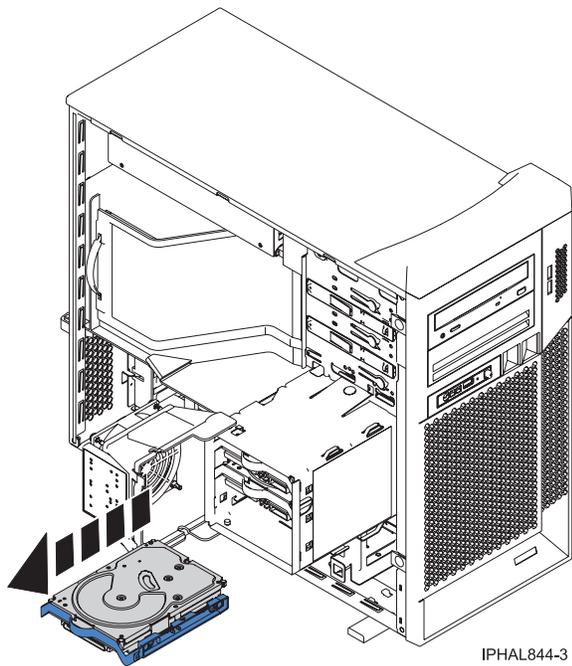
8. If your system has preinstalled hard disk drives in the drive cage, carefully disconnect the power and signal cables from the back of the drives.



IPHAL847-2

Figure 3. Unplugging cables from the disk drive

9. Remove the disk drive or the empty drive tray from the drive bay in which you want to install the drive. Grasp the blue drive tray and pull the drive out of the drive cage.



IPHAL844-3

Figure 4. Removing the drive tray

10. If you are replacing a disk drive, remove the drive tray from the disk drive that you pulled out of the system. Gently pull out on one side of the drive tray and pull the drive out of the drive tray, as shown in the following figure.

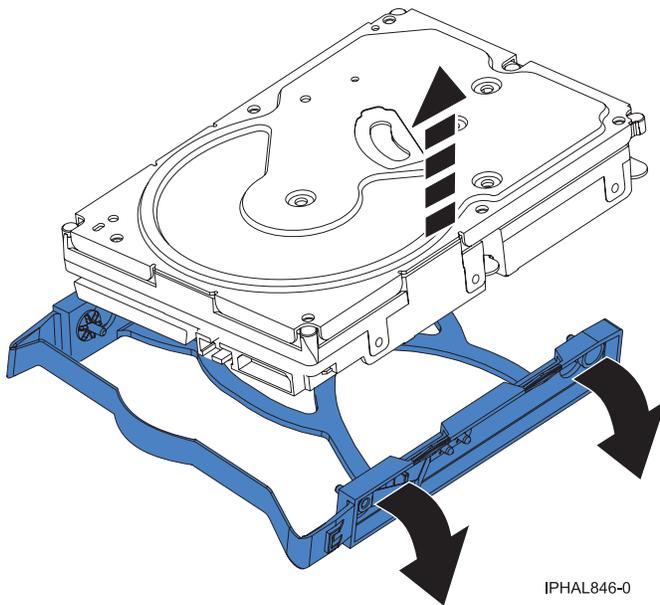


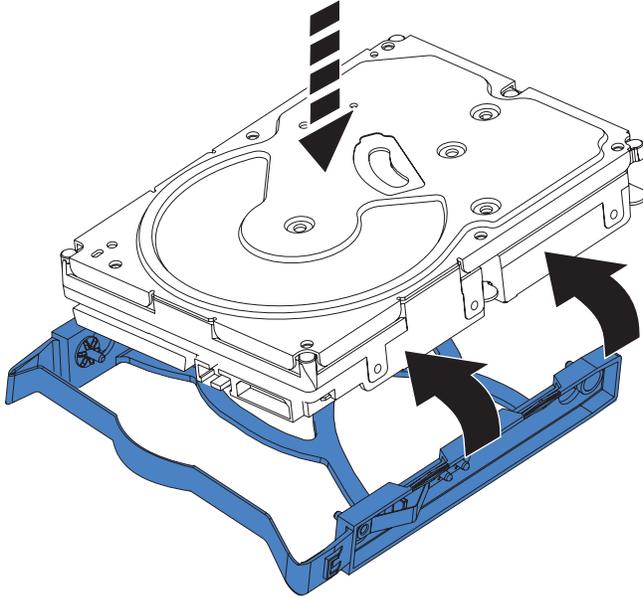
Figure 5. Removing the disk drive from the drive tray

11. Touch the protective package containing the new drive to any unpainted metal surface on the system. Then, remove the drive from the package and place it on a protective surface.
12. Determine the next available disk drive position in your system. For information, see “Disk drive locations” on page 138.

Note: When you have a system with an expansion unit, fill the slot positions in the system unit first. However, you can choose a different disk drive placement depending on your data protection strategy.

Install the disk drive

1. Select the slot where you want to install the disk drive.
2. Install the disk drive on to the drive tray by aligning the guide pins on the drive tray with the guide holes on both sides of the disk drive, as shown in the following figure.



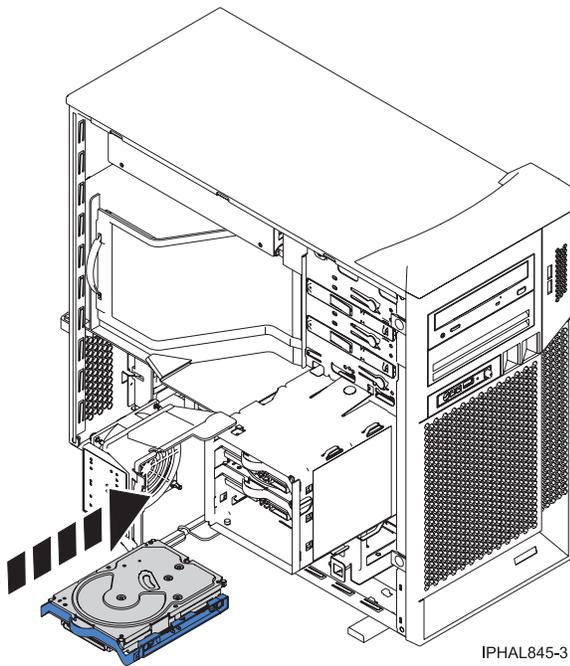
IPHAL849-0

Figure 6. Attaching the disk drive to the drive tray

3. Align the drive assembly with the guide rails in the drive bay.

Tip: Make sure that the connector end of the drive is facing you.

4. Gently slide the drive assembly into the drive bay until the drive snaps into place.



IPHAL845-3

Figure 7. Installing the disk drive

5. If you are installing more than one disk drive, repeat step 1 on page 6 through step 4 until all disk drives are installed.

Complete the installation

1. Connect the applicable signal cables into the back of the drive, as shown in the following figure.

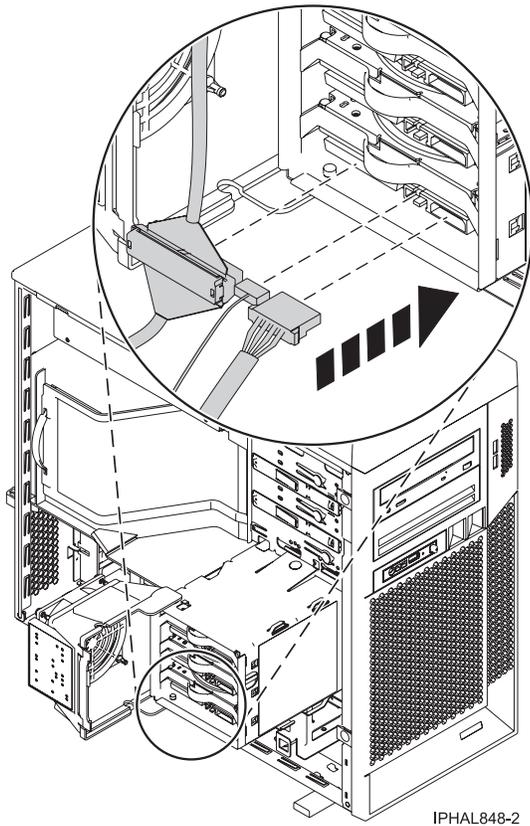


Figure 8. Plugging the cables in to the disk drive

2. Connect the power cables to the back of the drives. The connectors are keyed and can be inserted only one way.

Note: There are three cables to plug in to each drive.

3. Close the fan assembly over the disk-drive cage, as shown in the following figure.

Tip: Route the cables through the holes on either side of the fan assembly.

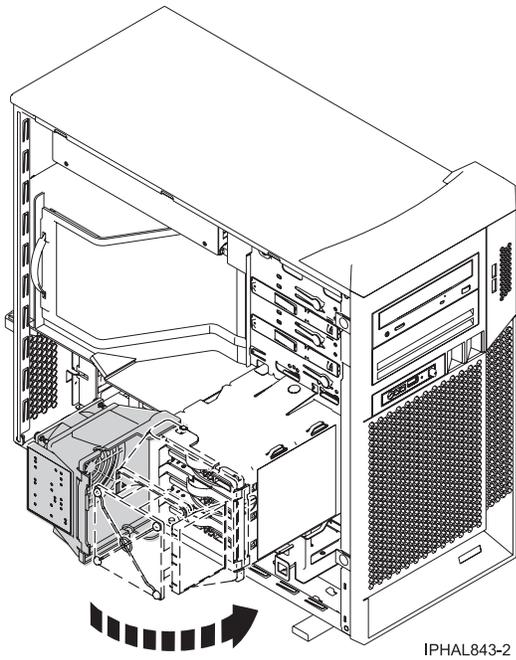


Figure 9. Closing the fan assembly

4. Push the disk-drive cage slightly forward, press the release tab **A**, and lower the cage into the system, as shown in the following figure.

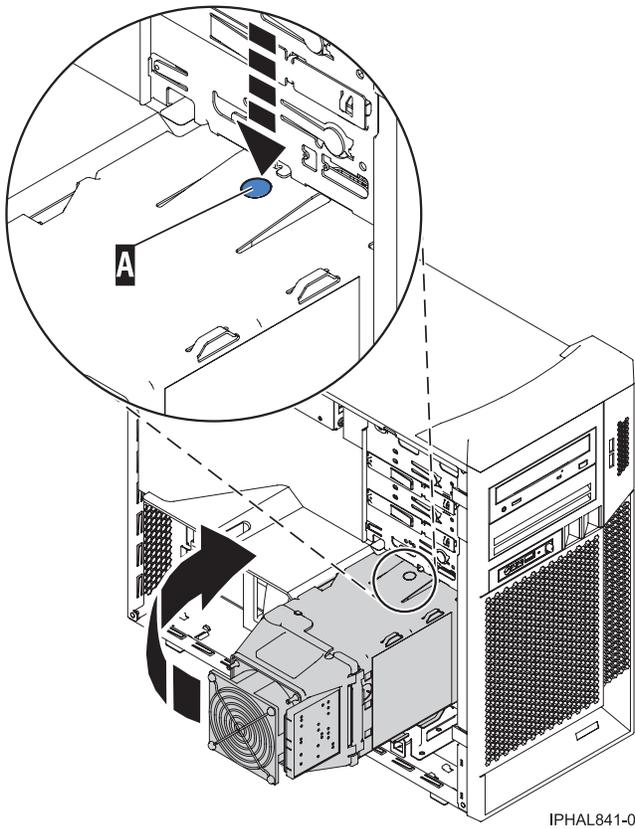


Figure 10. Rotating the drive cage into the system

5. Replace the side cover. For instructions, see “Remove and replace model 7047-185 or 7037-A50 covers and doors” on page 183.
6. If necessary, “Place the rack-mounted model 7047-185 or 7037-A50 in the operating position” on page 204.
7. Reconnect the power source to the system.
8. Start the system. For instructions, see “Start the system or logical partition” on page 167.
9. Verify that the new resource is functional. For instructions, see “Verify the installed part” on page 219.

Replace a disk drive in a model 9407-515

Use the procedure in this section to replace a disk drive if the operating system is i5/OS® and your system is using redundant array of independent disks (RAID) for disk protection.

If your operating system is not i5/OS or if you do not have RAID disk parity protection use the appropriate procedure from “Replace a disk drive” on page 53.

Attention: 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.

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)

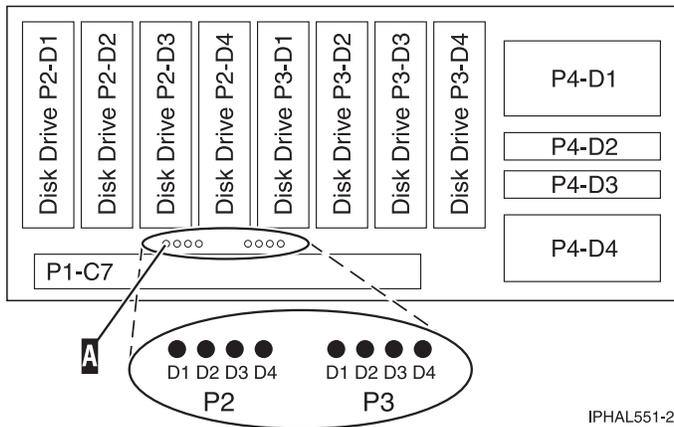
Remove the disk drive

1. Sign 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.
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 Time frame 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 the disk that has failed.
9. Select option 2, Display failing item information, to display the service action log entry.

10. Select option 2 by the Disk item, Display details, to display location information for the failing part to be replaced.
11. Select option 6, indicator on, to turn on the indicator light on the panel by the disk drives and physically locate the drive to be replaced.



IPHAL551-2

Figure 11. Concurrent maintenance lights

12. Choose the concurrent maintenance option. This option fills in the disk drive location on the concurrent maintenance display. Write this location down.

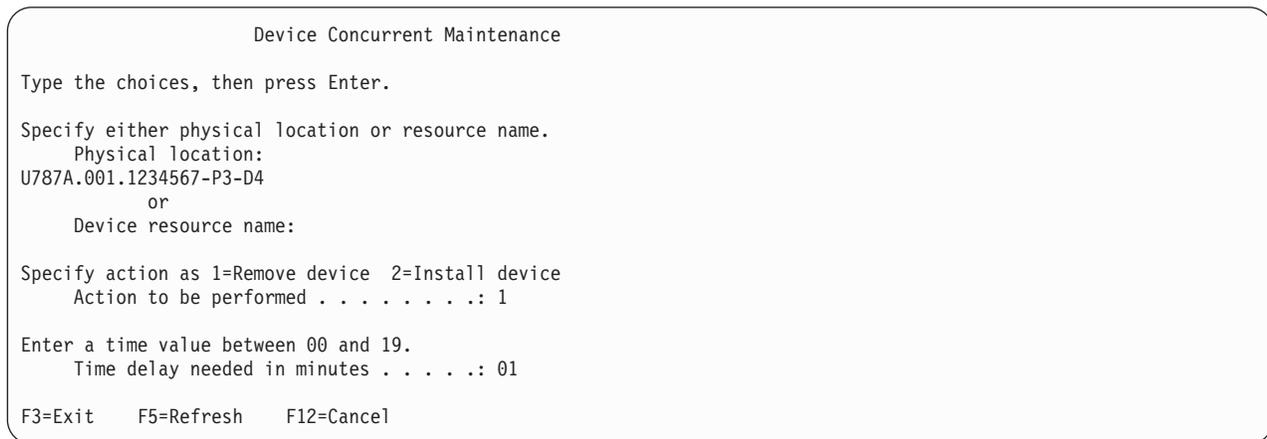


Figure 12. Example Device Concurrent Maintenance display

13. Select option 1 (Remove device) for the **Action to be performed**.
14. Set the time delay variable for one minute: 01 or up to nineteen minutes for enough time to locate the drive.

Important: Do not press Enter at this time. When you press Enter, after the delay you set, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive. If you do not remove the drive in this time this action will repeat two more times. If you have not removed the drive after the process repeats all three times you will have to start the concurrent maintenance procedure from the beginning.

15. Press Enter on the console.
16. When the concurrent maintenance light starts blinking, squeeze and pull the handle of the disk drive out toward you before you remove the disk drive, as shown in the following figure. If the handle is not all the way out, the disk drive cannot slide out.

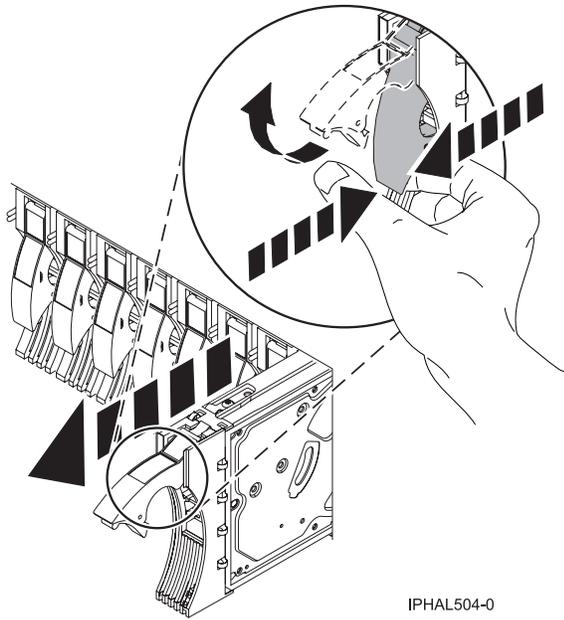
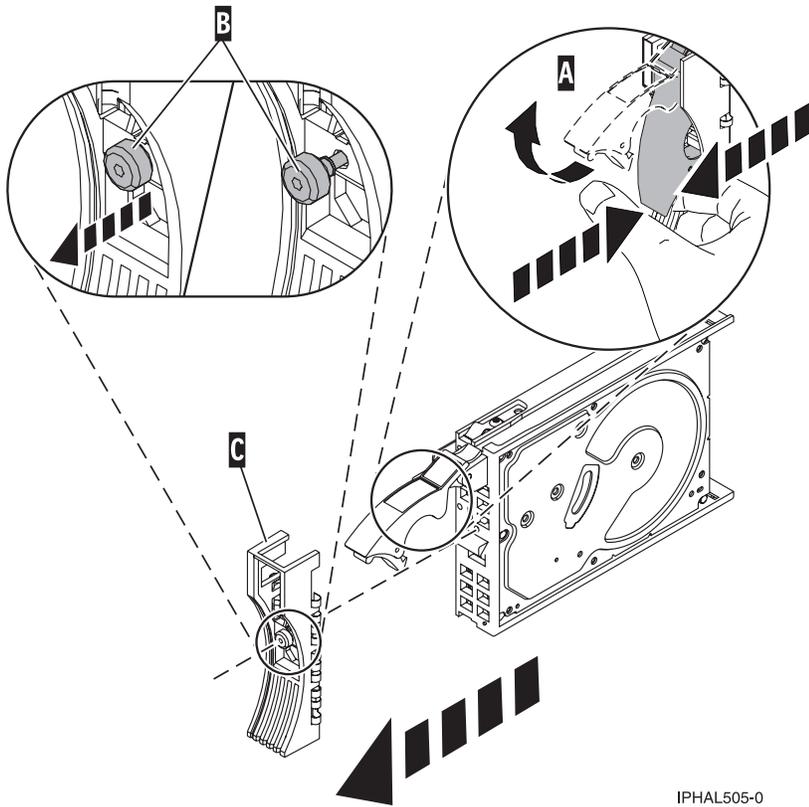


Figure 13. Removing a disk drive

17. Support the bottom of the disk drive as you slide it out of the system. Do not hold the disk drive by the handle.

Note: The concurrent maintenance light will stop blinking and remain off when the disk drive is removed.

18. Loosen and pull out on the thumbscrew **B** to remove the disk-drive bezel **C** from the failed disk drive, as shown in the following figure. You will need to attach this bezel to the replacement drive.

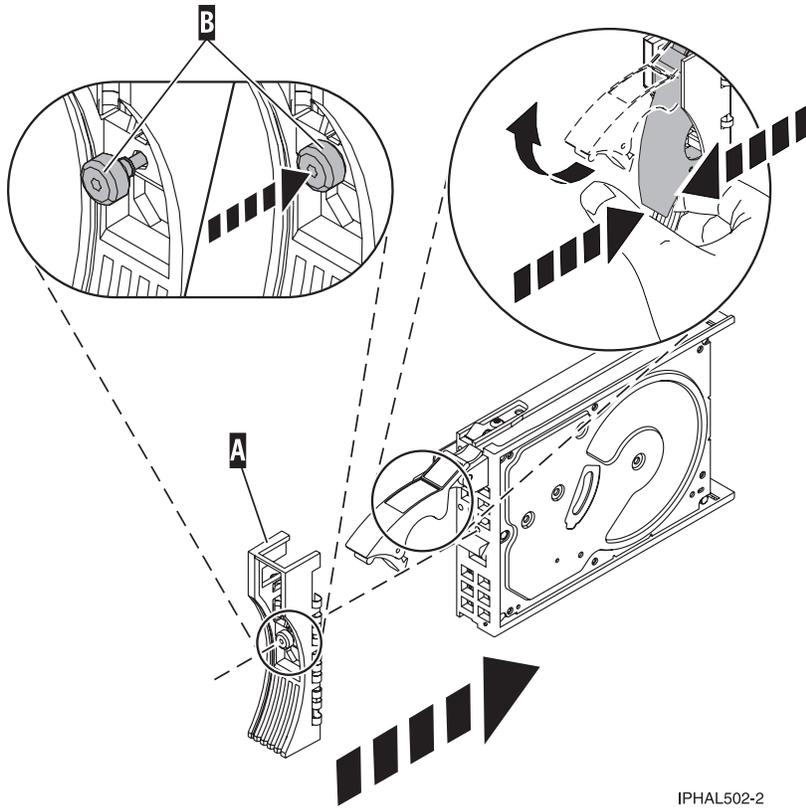


IPHAL505-0

Figure 14. Removing a disk-drive bezel

Replace the disk drive

1. Unlock the disk drive handle on the replacement disk drive by squeezing and pulling the handle out toward you before you install the disk drive. If the handle is not all the way out, the disk drive can not slide onto the disk drive bezel or into the system.
Attention: Disk drives are fragile. Handle with care.
2. Follow these steps to install the disk-drive bezel on the replacement disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.
 - b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



IPHAL502-2

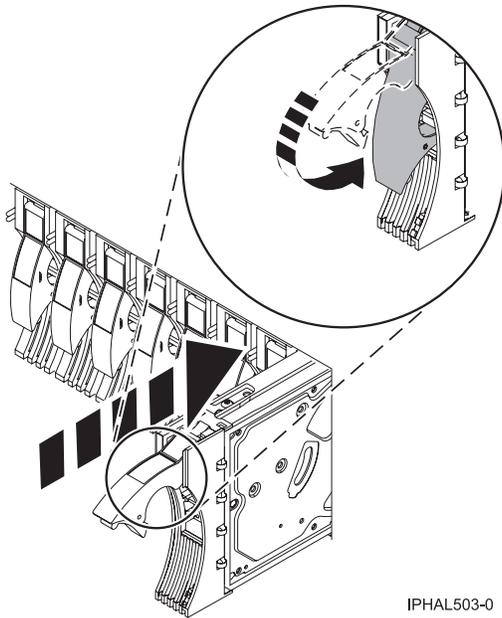
Figure 15. Installing a disk-drive bezel

3. Return to the console, the Concurrent Maintenance Results display is shown.
Press F12.
4. The physical location in step 12 on page 12 of this procedure should still appear on the display. If not, retype the physical location from step 12 on page 12.
5. Select option 2 (Install device) for the Action to be performed.
6. Set the time delay variable for one minute: 01 or up to nineteen minutes for enough time to locate the concurrent maintenance light.

Important: Do not press Enter at this time. When you press Enter, after the delay you set, this light comes on and begins to blink rapidly. You then have nine seconds to insert the disk drive. If you do not insert the drive in this time this action will repeat two more times. If you have not inserted the drive after the process repeats all three times you will have to start the concurrent maintenance procedure from step 6 on page 11.

7. Press Enter on the console.
8. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.
9. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
10. With the drive handle in the unlocked position, slide the disk drive halfway into the system or expansion unit.
11. When the light starts blinking, slide the disk drive all the way in. Then, lock the disk drive in place by pushing in the disk drive handle, as shown in the following figure.

Note: The light stops blinking and remains on when you have installed the disk drive properly.



IPHAL503-0

Figure 16. Installing a disk drive

Complete the procedure

1. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press Enter.
2. If you return to the Service Action Log display, exit the service action log.
3. When the Hardware Service Manager display is shown, press F3.
4. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.
5. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
6. Use the following steps to restore device parity protection (RAID) on the disk drive.
 - a. Select **Rebuild disk unit data** on the Work with Disk unit recovery display. Press Enter.
 - b. Select **1** to rebuild the disk drive displayed (the disk drive displayed is the disk drive that you **removed**) on the Rebuild Disk Unit Data display. Press Enter.
 - c. Press Enter on the Confirm Rebuild Disk Unit Data display.
 - d. Press F5 to refresh the display until the **Percent complete** shows 5%.
 - e. When the display shows at least 5% complete, you can either continue to monitor this display to completion, or press F3 (Exit) to return to the Work with disk units display.
 - f. Press F3 (Exit) to return to the System service tools display.
 - g. Press F3 (Exit) to return to the Exit SST display and press Enter.

Install a disk drive

You might need to install a Small Computer System Interface (SCSI) disk drive in the sever or expansion unit. Use the procedures in this section to perform this task.

Your system or logical partition can either be powered off or powered on when you install the disk drive.

Install a disk drive with the AIX system or logical partition powered on

You might need to install a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the AIX® operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: The powered-on procedure is a complex set of steps that must be performed precisely as instructed to avoid potential data loss or system damage. You might also consider the powered-off procedure, which is a simpler task that involves less risk of data loss or system damage. For instructions, see “Install a disk drive with the system or logical partition powered off” on page 44.

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.

Related information

General AIX diagnostic information

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.

2. Remove the system unit door, remove the expansion unit door, or open the rack. For instructions, select the appropriate procedure:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
4. Determine the next available disk drive position in your system or expansion unit. For information, see “Disk drive locations” on page 138.

Note: When you have a system with an expansion unit, fill the slot positions in the system unit first. However, you can choose a different disk drive placement depending on your data protection strategy.

5. Record the position where the new disk drive will be installed. For example, the next available disk drive slot might be P3-D4.
6. Perform the following steps to install a disk drive.

Install the disk drive

1. Log in as root user or use CE Login. For information on CE Login, go to General AIX diagnostic information.
2. At the command line, type `diag` and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. On the Tasks Selection display, select **Hot Plug Task**.
6. Select **SCSI and SCSI RAID Hot Plug Manager**.
7. Select **Attach a Device to a SCSI Hot Swap Enclosure Device**. A list of empty slots in the SCSI hot swap enclosure device is shown.
8. Select the slot where you want to install the disk drive and press Enter.
 The disk drive slot enters the Identify state. The concurrent maintenance light for the slot begins flashing. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:
 - “Disk-drive concurrent maintenance lights for model 505” on page 153
 - “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
 - “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
 - “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
9. If the slot you want to use contains a disk-drive filler, complete the following step.
 Pull the disk-drive filler from the slot that you want to use, as shown in Figure 17 on page 19 or Figure 18 on page 19

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

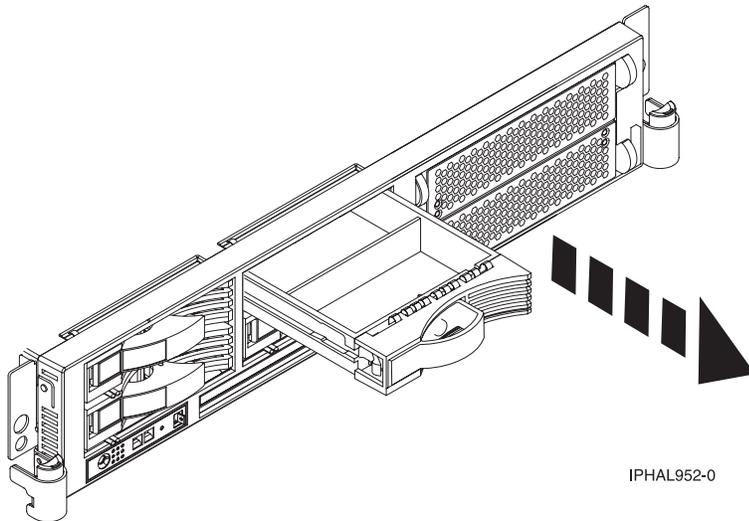


Figure 17. Removing a disk-drive filler from a model 51x or 710

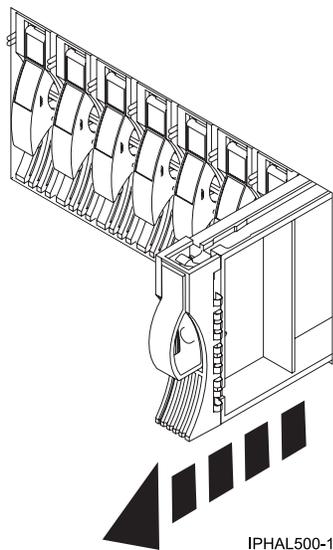
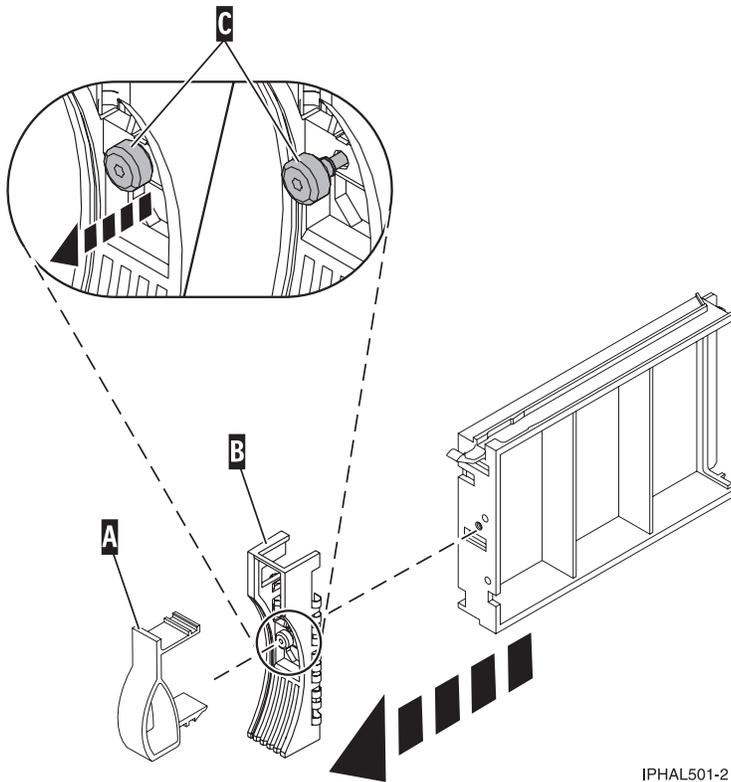


Figure 18. Removing a disk-drive filler from a model .285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

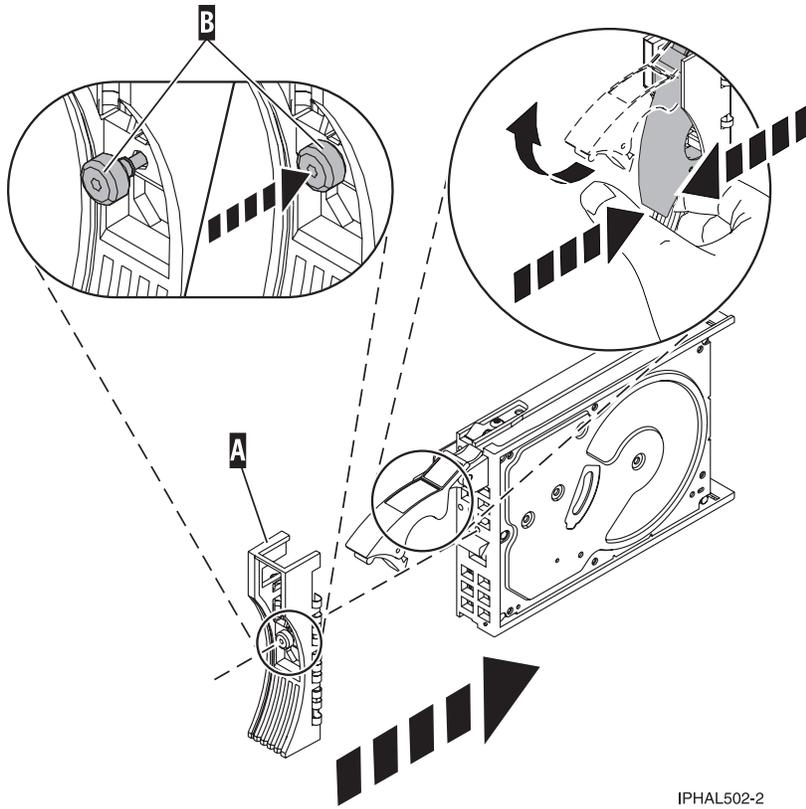
10. If the slot you want to use contains a disk-drive filler, complete the following step.
Remove the disk-drive bezel latch **A** from the front of the filler, as shown in the following figure.



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Figure 19. Removing a disk-drive bezel from a disk-drive filler

11. If the slot you want to use contains a disk-drive filler, complete the following step.
Loosen, and then pull out on the thumbscrew **C** to release the bezel **B** from the front edge of the filler.
12. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
13. Remove the disk drive from the static-protective package.
14. Unlock the disk drive handle by squeezing it and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
15. If the disk drive you are installing does not have a bezel preinstalled, then complete the following step.
Attach the disk-drive bezel **A** to the disk drive, as shown in the following figure.



IPHAL502-2

Figure 20. Installing a disk-drive bezel on a disk drive

16. If the disk drive you are installing does not have a bezel preinstalled, then complete the following step.
Press in and then tighten the thumbscrew **B** to secure the bezel **A** to the disk drive.
17. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
18. Slide the disk drive into the system unit until it stops, as shown in Figure 21 on page 22 or Figure 22 on page 22.
19. Push the disk drive handle in until it locks. The light on the disk drive will turn on.

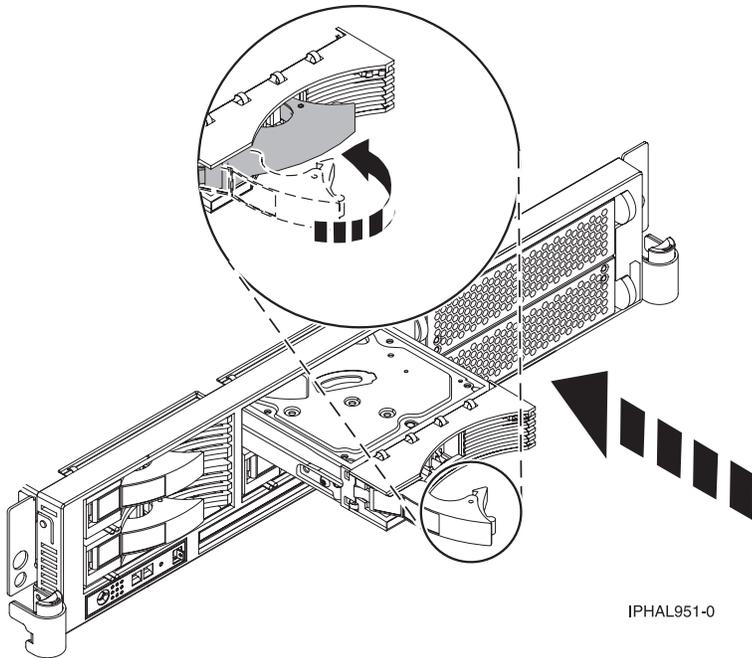


Figure 21. Installing a disk drive in model 51x or 710

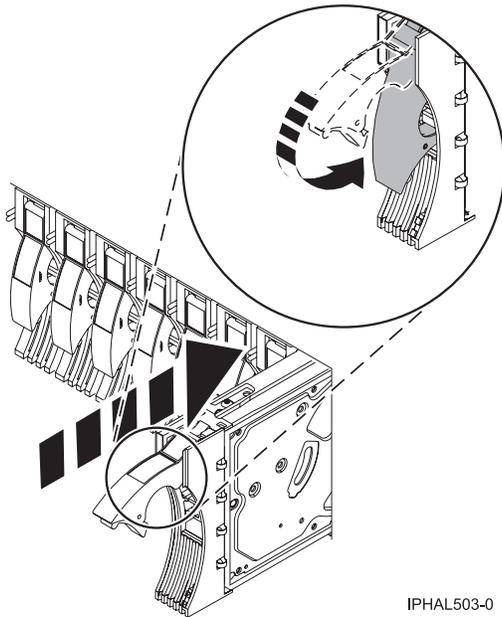


Figure 22. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

20. Press Enter.
21. If you are installing more than one disk drive, repeat step 1 on page 18 through step 20 until all disk drives are installed.
22. Cancel to get to the SCSI and SCSI RAID Hot Plug Manager menu.
23. Select **Configure Added/Replaced Devices**.
24. Exit to the command line.

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
2. Install or close the system, expansion unit, or rack door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. Verify the installed part. For instructions, see “Verify an installed feature or replaced part on an AIX system or logical partition” on page 219.
4. To prepare the newly installed disk drive for use, go to “Prepare a disk drive for use in an AIX system or logical partition” on page 158.

Install a disk drive with the i5/OS system or logical partition powered on

You might need to install a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the i5/OS operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: The powered-on procedure is a complex set of steps that must be performed exactly to avoid potential data loss or system damage. You might also consider the powered-off procedure, which is a simpler task that involves less risk of data loss or system damage. For instructions, see “Install a disk drive with the system or logical partition powered off” on page 44.

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.

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:

- “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - “Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit” on page 181
 - If you have a front cover from any other models, remove the front cover.
4. Determine the next available disk drive position for your system or expansion unit. For information, see “Disk drive locations” on page 138.

Tip: When you have a system with an expansion unit, fill the slot positions in the system unit first. However, you can choose a different disk drive placement depending on your data protection strategy.

If you are using logical partitions, go to Load source placement rules for i5/OS logical partitions for specific load-source disk drive locations.

5. Record the position where the new disk drive will be installed. For example, the next available disk drive slot might be P3-D4.
6. If your system is managed by a Hardware Management Console (HMC), use the HMC to complete the steps for installing the disk drive. For instructions, see “Install a feature using the Hardware Management Console” on page 211. If you do not have an HMC, do the following steps to install a disk drive.

Prepare to install the disk drive

1. Record the physical location where the new disk drive will be installed.

The physical location has the following form: U787A.001.AAAXXXX-P3-D4 where P3-D4 is the position of the disk drive in the system unit or expansion unit. Find the U787A.001.AAAXXXX location information from the control panel display on the system unit or expansion unit.

If you cannot find the location information from the control panel, find the feature code (FC) and sequence number (SN or SEQ) on the label that appears on the front of the system unit or expansion unit, as shown in the following figure.



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Figure 23. Example of a system or expansion unit label

In this example, U787A.001.AAAXXXX-P3-D4, U787A.001 comes from the feature code (FC) on the label, AAAXXXX comes from the last seven digits of the sequence number (SN or SEQ) on the label, and P3-D4 is the slot where you are installing the disk drive as shown in “Disk drive locations” on page 138.

In the example, U5074.001.AAAXXXX-DB3-D32, you would install a disk drive in the expansion unit with type 5074, model 001, sequence number AAAXXXX, and disk drive position DB3-D32.

2. Sign on to service level authority.
3. Type `strsst` on the command line of the i5/OS session and press Enter.
4. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Remember: 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. If the slot you want to use contains a disk-drive filler, follow these steps.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
- a. Pull the disk-drive filler from the slot, as shown in the following figure.

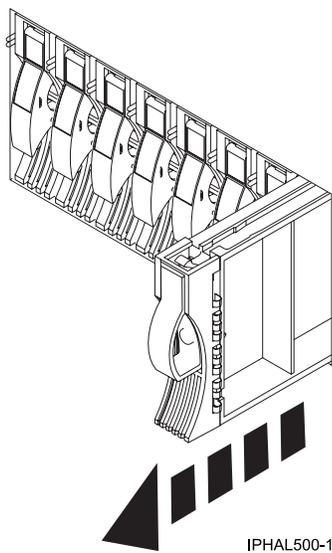
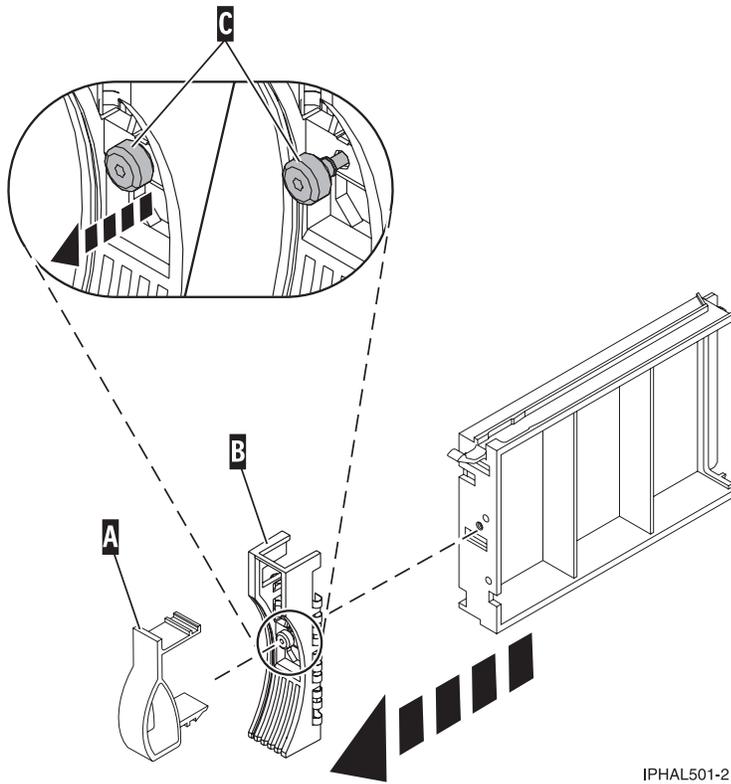


Figure 24. Removing a disk-drive filler

- b. Pull off the disk drive bezel latch A from the front of the filler, as shown in the following figure.



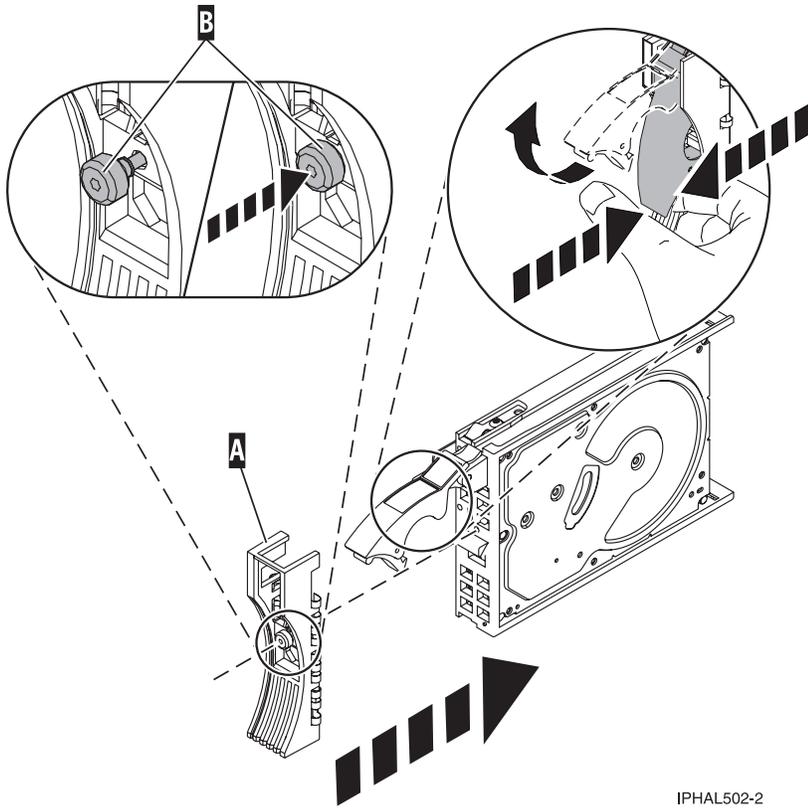
IPHAL501-2

Figure 25. Removing a disk-drive bezel

- c. Loosen, and then pull out the thumbscrew **C** to release the disk-drive bezel **B** from the front edge of the filler.

Install the disk drive

1. Find the package that contains the new disk drive.
 - Attention:** Disk drives are fragile. Handle with care.
2. Remove the disk drive from the protective package. Record the serial number (use the last 4 digits) of the disk drive.
3. Unlock the disk drive handle by squeezing it and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
4. Follow these steps to install the disk-drive bezel on the new disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.



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Figure 26. Installing a disk-drive bezel on a disk drive

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
5. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
6. Slide the disk drive halfway into the system or expansion unit.
7. Select **Device Concurrent Maintenance** from the Hardware Service Manager display. Press Enter. The Device Concurrent Maintenance is displayed, as shown in the following figure.

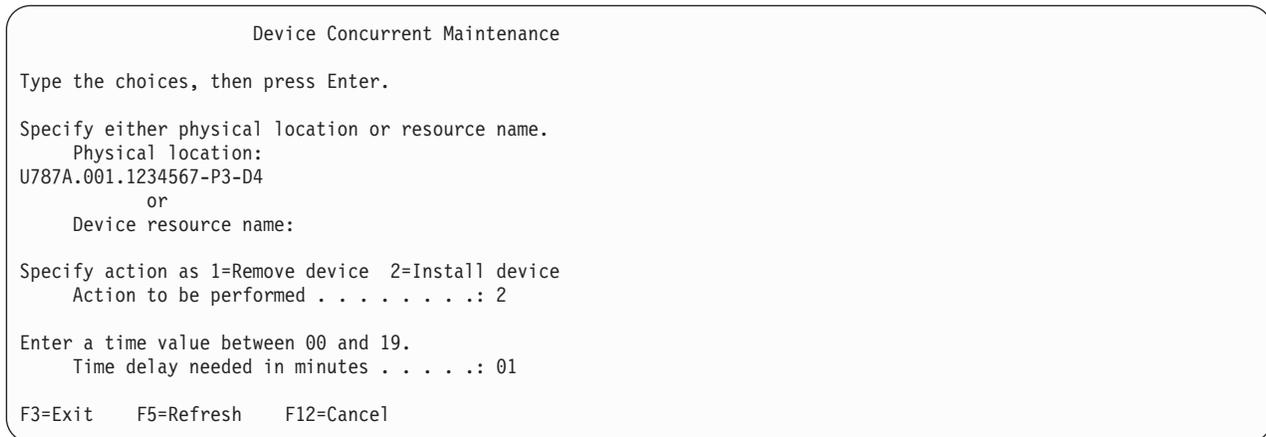


Figure 27. Example Device Concurrent Maintenance display

8. In the **Specify either physical location or resource name** field, type the physical location that you had previously recorded in this procedure, as shown in Figure 27.
9. Select option 2 (Install device) for the Action to be performed.

10. Set the time delay for one minute - 01.

Important: Do not press Enter at this time.

11. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are installing. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:
 - “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
 - “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
 - “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
12. Press Enter on the console.

Important: When you press Enter, after a one minute delay, the light comes on and begins to blink rapidly. You then have nine seconds to slide the disk drive all the way in and then lock it in place by pushing in the disk drive handle.

13. When the concurrent maintenance light starts blinking, slide the disk drive all the way in and lock it in place by closing the latch, as shown in the following figure.

Note: The light stops blinking and remains on when you have installed the disk drive properly.

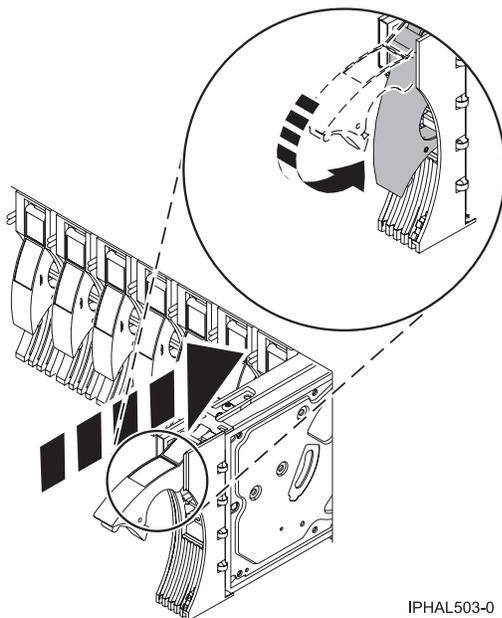


Figure 28. Sliding the disk drive in to the system unit

14. If you are installing more than one disk drive, perform step 1 on page 25 through 13 until all disk drives are installed.

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190

- “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, install the front cover.
2. Install or close the front door of the system, expansion unit or rack. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
 3. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press Enter.
 4. When the Hardware Service Manager display is shown, press F12 twice and then press Enter.
 5. To complete this procedure, go to “Configure a disk drive in an i5/OS system or logical partition” on page 158.

Install a disk drive with the Linux system or logical partition powered on

You might need to install a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the Linux[®] operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: Be sure you read these instructions carefully and understand the complexity of the powered-on procedure before you begin.

If any of the following steps apply to you, go to “Install a disk drive with the system or logical partition powered off” on page 44.

- You are installing a disk drive in a 5791, 5794, or 7040-61D expansion unit.
- You are installing a disk drive that will be connected with the 6203 or 6204 SCSI adapter.
- You do not feel comfortable using the powered-on procedure.

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.

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171

- “Expansion unit cover or door” on page 175
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.
 4. Look at the front of the system or expansion unit and determine the next available disk drive position. For information, see “Disk drive locations” on page 138.

Note: When you have a system with an expansion unit, fill the slot positions in the system unit first. However, you can choose a different disk drive placement depending on your data protection strategy.

5. Record the position where the new disk drive will be installed. For example, the next available disk drive position might be P3-D4.

Install a SCSI disk drive in a system or expansion unit using Linux kernel 2.4 or Linux kernel 2.6.

Install a disk drive using Linux kernel 2.4

If you are installing a disk drive in a location that is controlled by Linux kernel 2.4, follow the procedure in this section to perform this task.

Install the disk drive:

1. If the slot you want to use contains a disk-drive filler, complete the following procedure:
 - Attention:**
 - Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
 - a. Pull the disk-drive filler from the slot, as shown in Figure 29 on page 33 or Figure 30 on page 33.

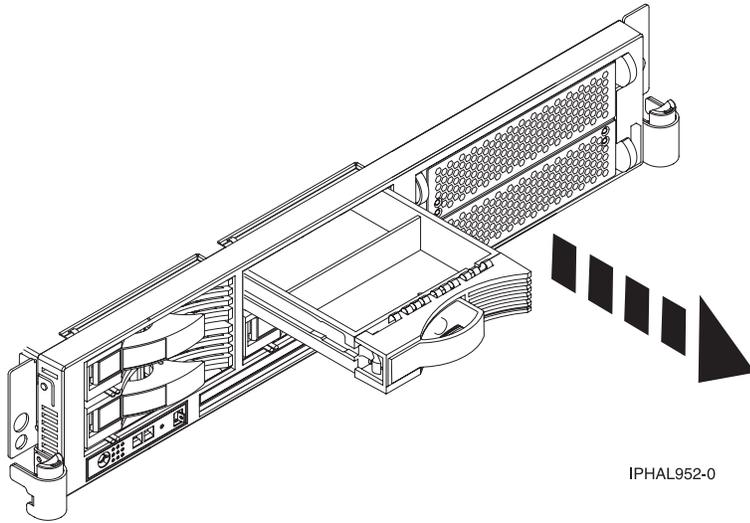


Figure 29. Removing a disk-drive filler from model 51x or 710

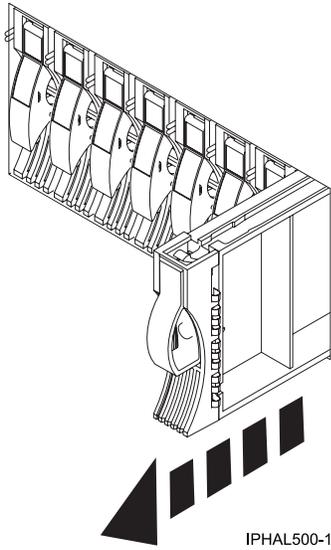
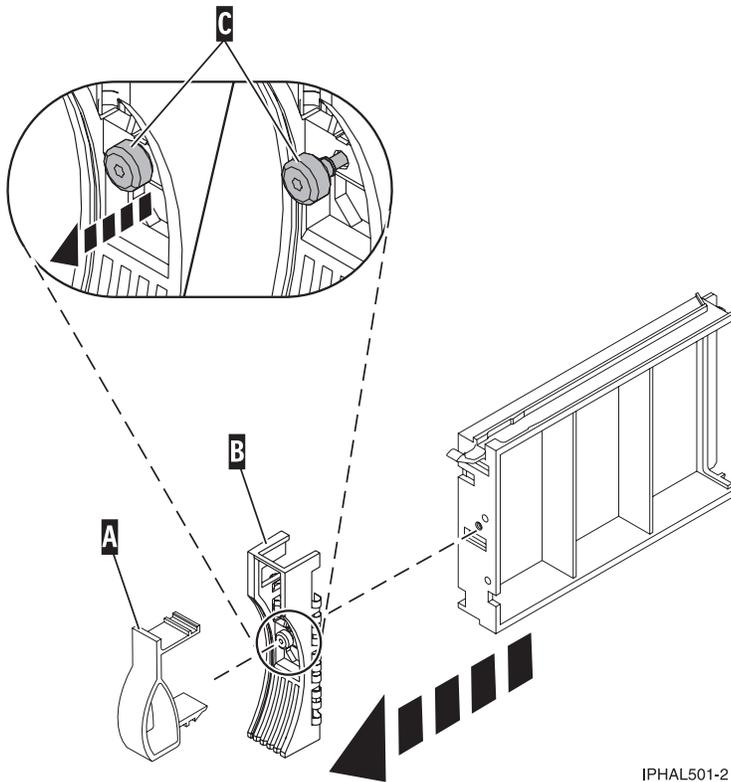


Figure 30. Removing a disk-drive filler from model 285, 52x, 9116-561, 570, 720, or 7311-D20

- b. Pull off the disk-drive bezel latch A from the front of the filler, as shown in the following figure.

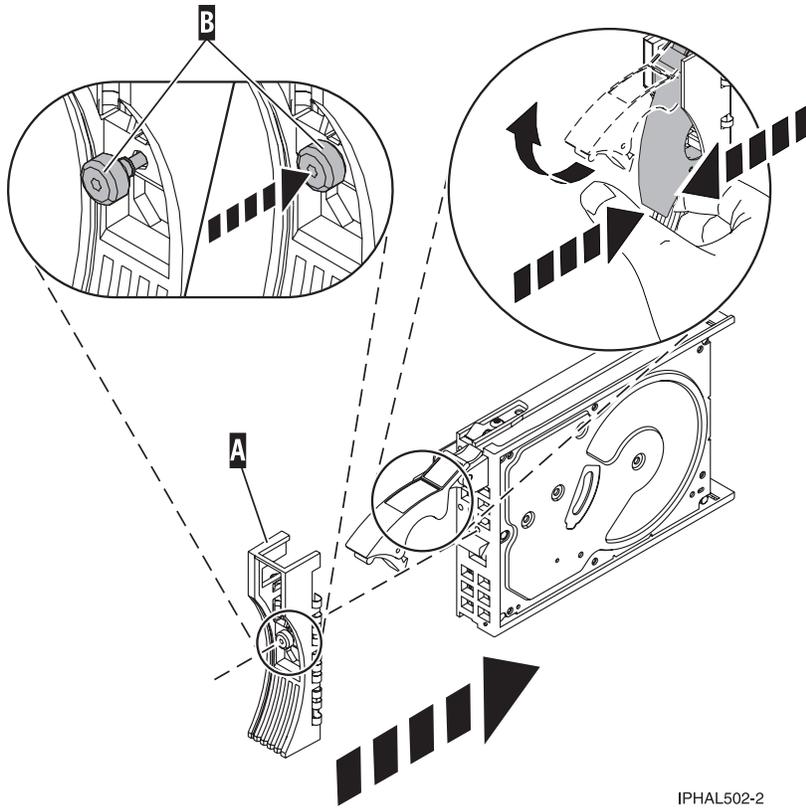


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Figure 31. Removing the disk-drive bezel

- c. Loosen, and then pull out on the thumbscrew **C** to release the disk-drive bezel **B** from the front edge of the filler.
2. Find the package that contains the new disk drive.

Attention: Disk drives are fragile. Handle with care.
3. Remove the disk drive from the static-protective package. Record the serial number (use the last 4 digits) of the disk drive.
4. Unlock the disk drive handle by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
5. If your disk drive does not have a bezel preinstalled, follow these steps to install the disk-drive bezel on the new disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.



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Figure 32. Installing a disk-drive bezel

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
6. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
7. Slide the disk drive into the system.

Slide the disk drive all the way in to the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 33 on page 36 or Figure 34 on page 36.

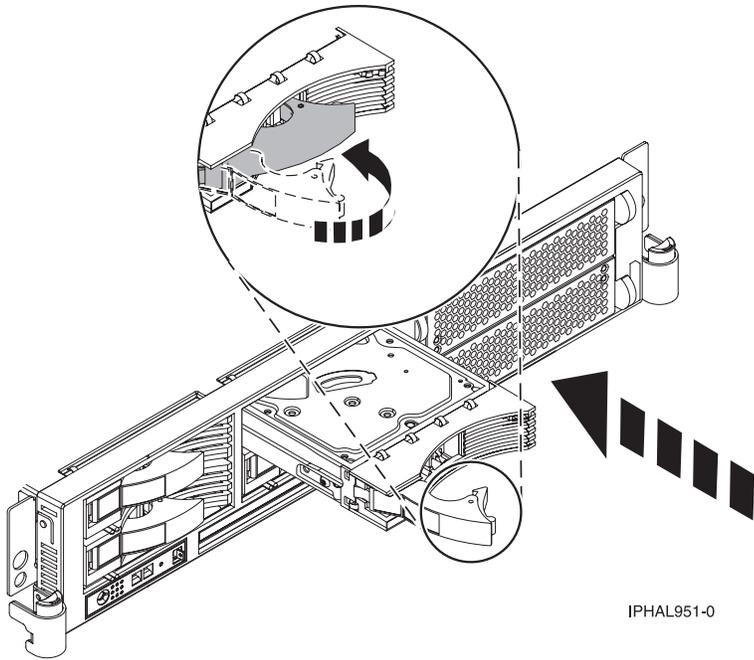


Figure 33. Installing a disk drive in model 51x and 710

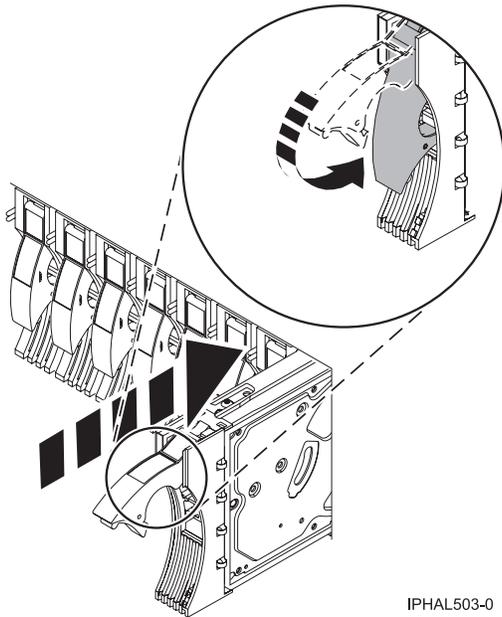


Figure 34. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

Note: The concurrent maintenance light stops blinking and remains on when you have installed the disk drive correctly.

To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

- “Disk-drive concurrent maintenance lights for model 505” on page 153
- “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
- “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153

- “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
8. If you are installing more than one disk drive, repeat step 1 on page 32 through step 7 on page 35, until all disk drives are installed.
 9. Log in as root user.
 10. Wait 30 seconds after installing the disk drive, and then type `iprconfig` on the command line of the Linux session. Press Enter. The Work with Disk Units display is shown.
 11. Select **Display disk hardware status** from the Work with Disk Units display. Press Enter. A Display Disk Hardware Status display is shown, similar to the following figure.

```

Display Disk Hardware Status

Serial  Vendor  Product          Resource      Hardware
Number  ID       ID              Model Name        Status
03132041 IBM     2780001         001  /dev/iplr3   Operational
000015A5 IBM     ST373453LC      079                DPY/Active
E3V1WEAB IBM     IC35L036UCDY10-0 070                DPY/Active
E3V0J55B IBM     IC35L036UCDY10-0 079                DPY/Active
E3V1W1UB IBM     IC35L036UCDY10-0 070                DPY/Active
04B81193 IBM     3C98D203        210  /dev/sdi     Operational
000227CE IBM     ST336605LC      020  /dev/sdh     Operational
00000001 IBM     570B001         001  /dev/iplr2   Operational
00006719 IBM     ST336607LC      020  /dev/sdd     Operational
E3V0E77B IBM     IC35L036UCDY10-0 020  /dev/sde     Operational
0007E0C4 IBM     ST373453LC      020  /dev/sdf     Operational
00000001 IBM     5702001         001  /dev/iplr1   Operational
03060038 IBM     5703001         001  /dev/iplr0   Operational
More...

Press Enter to continue.

e=Exit      q=Cancel    r=Refresh  f=PageDn   b=PageUp
d=Display disk unit details  p=Display device parity status

```

Figure 35. Display Disk Hardware Status display

12. Locate the disk drive that you installed. The serial number might be 0.
 - If the disk drive is displayed as a model 50 disk, you are done. If not, follow these steps:
 - a. Find the `/dev/sdx` name associated with the disk drive that you installed.
 - b. Exit to the command line.
 - c. Type `sg_map` on the command line and press Enter.
 - d. Using the output from running the `sg_map` command, correlate the `/dev/sdx` device to a `/dev/sgx` device.
 - e. Type `sg_inq /dev/sgx` on the command line using the `/dev/sgx` value from the previous step. Press Enter.
 - f. Type `iprconfig` on the command line and press Enter.
 - g. Select **Display disk hardware status** from the Work with Disk Units display. Press Enter.
 - h. The serial number for the newly installed disk drive will be displayed on the Display Hardware Status display.
13. Record the resource name, when you configure the disk drive.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:

- “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
 3. Configure the newly installed disk drive for your environment. For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

Install the disk drive using Linux kernel 2.6

If you are installing a disk drive in a location that is controlled by Linux kernel 2.6, follow the procedure in this section to perform this task.

Install the disk drive:

1. Log in as root user.
2. Type `lsslot` on the command line of the Linux session and press Enter.
A display similar to the following figure, is shown.

```
x0537p1:~ # lsslot
# Slot      Description      Linux Name      Device(s)
U787A.001.DNZ00XV-P1-C1 Logical I/O Slot 0000:00:02.0  ethernet
U787A.001.DNZ00XV-P1-C2 Logical I/O Slot 0000:00:02.2  pci
U787A.001.DNZ00XV-P1-C3 Logical I/O Slot 0001:00:02.2  pci1069,b166
U787A.001.DNZ00XV-P1-C4 Logical I/O Slot 0000:00:02.6  pci1069,b166
U787A.001.DNZ00XV-P1-C5 Logical I/O Slot 0001:00:02.6  pci1014,0180
U787A.001.DNZ00XV-P1-T5 Logical I/O Slot 0000:00:02.4  ethernet
U787A.001.DNZ00XV-P1-T7 Logical I/O Slot 0000:00:02.3  usb
U787A.001.DNZ00XV-P1-T10 Logical I/O Slot 0001:00:02.4  scsi
U787A.001.DNZ00XV-P1-T12 Logical I/O Slot 0001:00:02.3  ide
U9111.520.10D3C6C-V1-C0 Virtual I/O Slot 30000000      vty
```

Figure 36. Find the Linux Name for the location for which you want to install the disk drive.

3. Note the Linux Name for the slot that contains the adapter under which you want to install the disk drive.
4. Type `iprconfig` on the command line of the Linux session and press Enter. The IBM Power RAID Configuration Utility display is shown.
5. Select **Work with disk unit recovery** from the IBM Power RAID Configuration Utility display. Press Enter.
6. Select **Concurrent add device** from the Work with Disk Unit Recovery display. Press Enter.
A Concurrent Device Add display, similar to the following figure, is shown.

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

Figure 37. Example Concurrent Device Remove display

7. Type option 1 next to the location into which you want to install the disk drive and press Enter. The Verify Device Concurrent Add display is shown. A concurrent maintenance light indicates the slot where the disk drive can be installed.
8. Press Enter on the Verify Device Concurrent Add display to verify the location.
9. If the slot you want to use contains a disk-drive filler, follow these steps:

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
- a. Pull the disk-drive filler from the slot as shown in Figure 38 or Figure 39 on page 40.

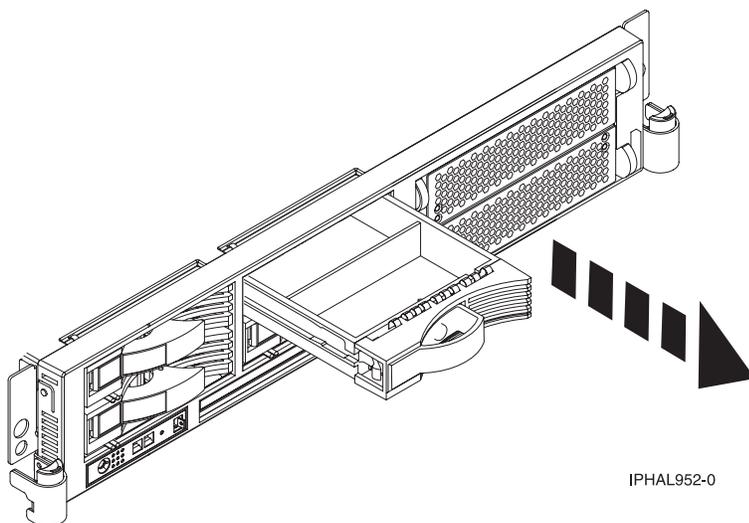


Figure 38. Removing a disk-drive filler from model 51x and 710

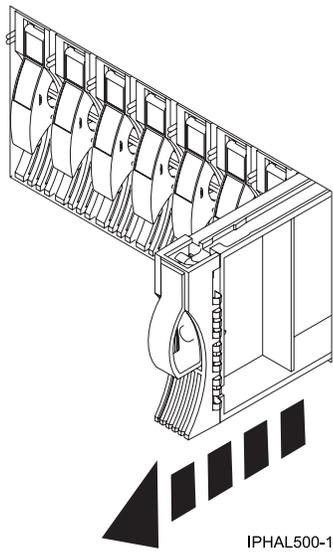


Figure 39. Removing a disk-drive filler from model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

b. Pull off the disk-drive bezel latch **A** from the front of the filler, as shown in the following figure.

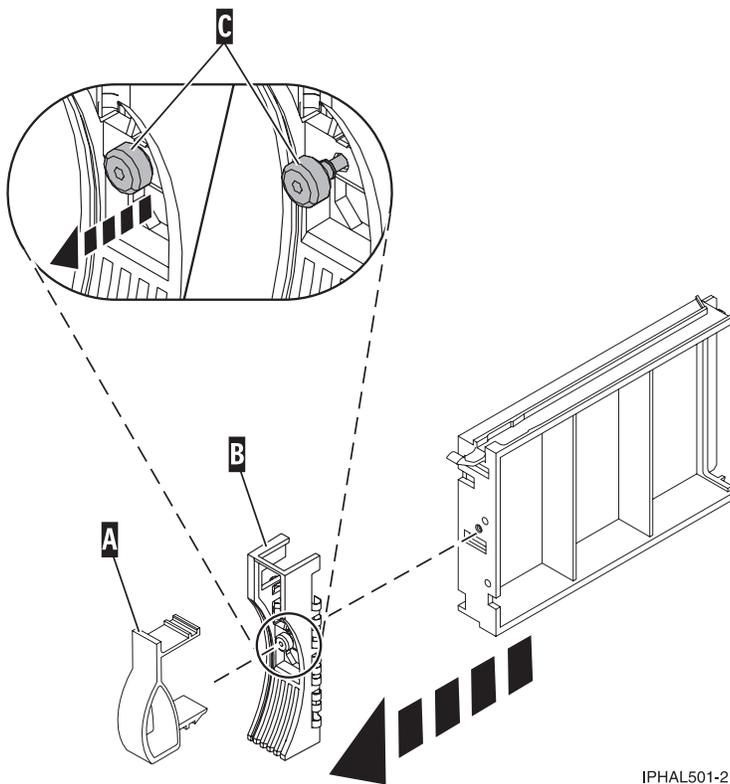


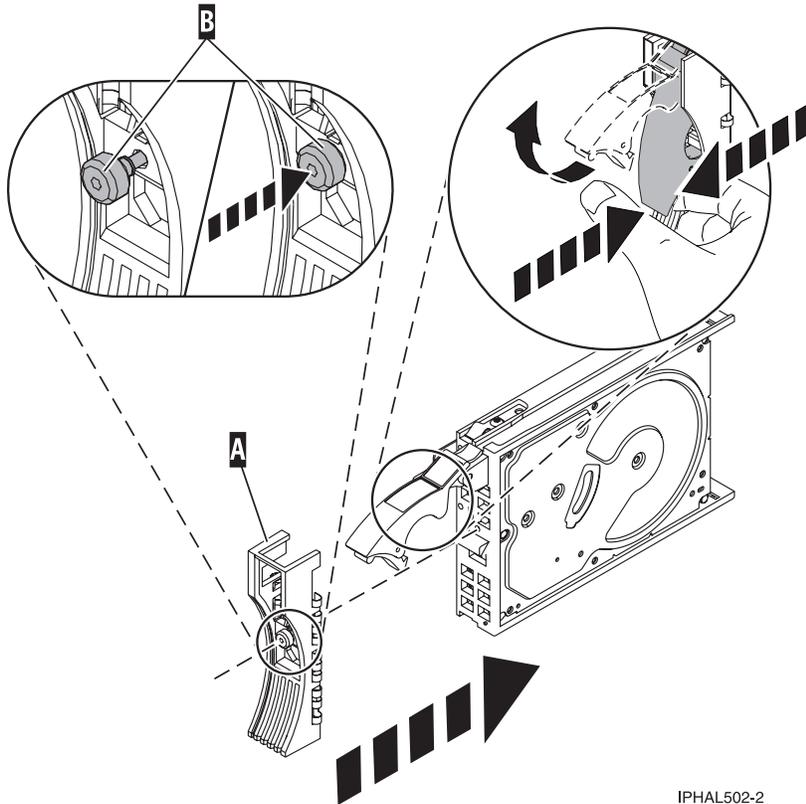
Figure 40. Removing a disk-drive bezel from the disk drive.

c. Loosen, and then pull out on the thumbscrew **C** to release the disk-drive bezel **B** from the front edge of the filler.

10. Find the package that contains the new disk drive.

Attention: Disk drives are fragile. Handle with care.

11. Remove the disk drive from the static-protective package. Record the serial number (use the last 4 digits) of the disk drive.
12. Unlock the disk drive handle by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive cannot slide into the system or expansion unit.
13. If your disk drive does not have a bezel preinstalled, follow these steps to install the disk-drive bezel on the new disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.



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Figure 41. Attaching the disk-drive bezel to the disk drive.

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
14. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
15. The Complete Device Concurrent Add display is shown.
16. Slide the disk drive into the system.
Slide the disk drive all the way in into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 42 on page 42 or Figure 43 on page 42.

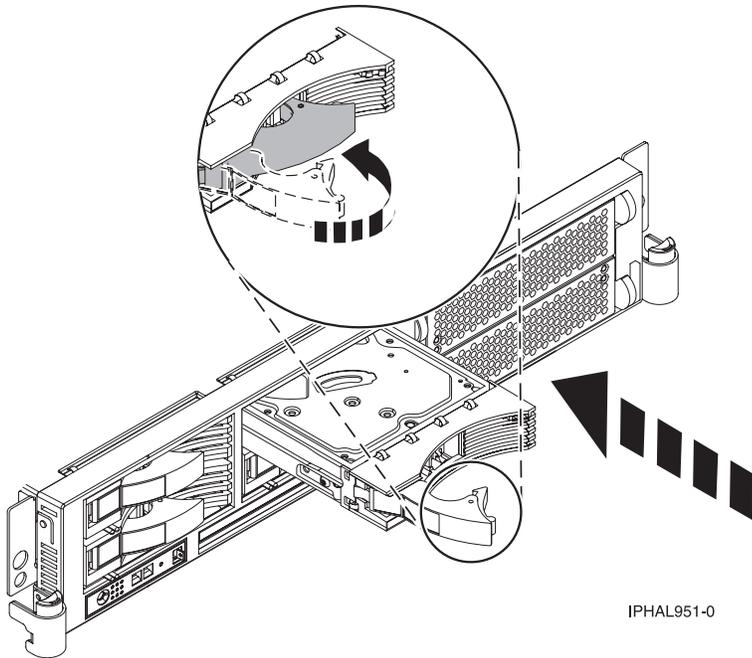


Figure 42. Installing a disk drive in model 51x and 710

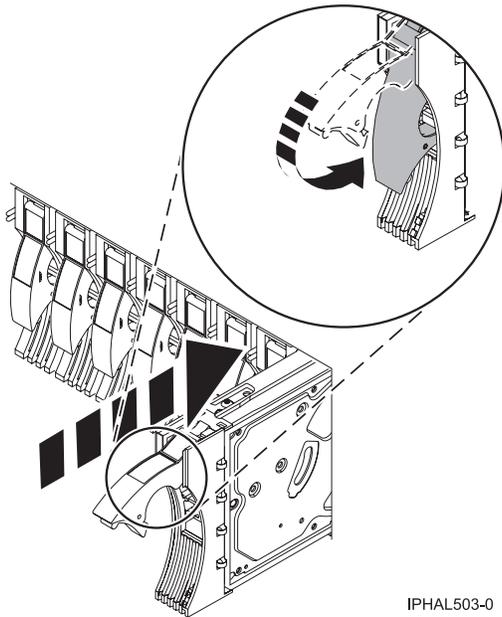


Figure 43. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

17. Press Enter. The concurrent maintenance light stops blinking and remains on when you have installed the disk drive properly.

To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

- “Disk-drive concurrent maintenance lights for model 505” on page 153
- “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
- “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153

- “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
18. If you are installing more than one disk drive, repeat step 2 on page 38 through step 17 on page 42 until all disk drives are installed.

Verify that the new disk drive is operational:

To verify that the new disk drive is operational, follow these steps:

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

The Display Hardware Status display is shown, similar to the following figure.

Display Hardware Status			
Type option, press Enter.			
1=Display hardware resource information details			
OPT Name	PCI/SCSI Location	Description	Status
	0000:01:01.0.0/	PCI-X SCSI Adapter	Operational
	0000:41:01.0.1/	PCI-X SCSI Adapter	Operational
sda	0000:41:01.0.1/0:3:0	Physical Disk	Active
sdb	0000:41:01.0.1/0:4:0	Physical Disk	Active
sdc	0000:41:01.0.1/0:8:0	Physical Disk	Active
sdd	0000:41:01.0.1/1:3:0	Physical Disk	Active
sde	0000:41:01.0.1/1:4:0	Physical Disk	Active
sdf	0000:41:01.0.1/1:5:0	Physical Disk	Active
	0001:61:01.0.2/	PCI-X SCSI RAID Adapter	Operational
sdg	0001:61:01.0.2/0:3:0	Physical Disk	Active
	0001:61:01.0.2/0:6:0	Advanced Function Disk	Active
sdi	0001:61:01.0.2/0:9:0	Physical Disk	Active
sdh	0001:61:01.0.2/255:0:0	RAID 10 Disk Array	Failed
	0001:61:01.0.2/0:4:0	RAID 10 Array Member	Failed
	0001:61:01.0.2/0:5:0	RAID 10 Array Member	Failed
e=Exit q=Cancel r=Refresh t=Toggle			

Figure 44. Example Display Hardware Status

4. Verify that the disk drive that you installed is shown on this display.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, remove the front cover.

2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. Configure the newly installed disk drive for your environment. For information, go to the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

Install a disk drive with the system or logical partition powered off

You might need to install a Small Computer System Interface (SCSI) disk drive in a system or logical partition that controls the disk drive location with the power off. Use the procedure in this section to perform this task.

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)

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Remove the system unit door or expansion unit door, or open the rack. For instructions, select the appropriate procedure from the following list:

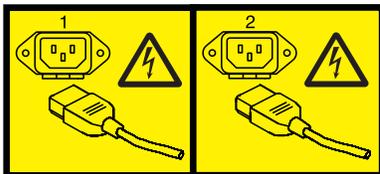
- “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.
 4. Determine the next available disk drive position in your system or expansion unit. For information, see “Disk drive locations” on page 138.

Note: When you have a system with an expansion unit, you should typically fill the slot positions in the system unit first. However, you can choose a different disk drive placement depending on your data protection strategy.

5. Stop the system or the logical partition that controls the disk drive location. For instructions, see “Stop the system or logical partition” on page 169.
6. If you stopped the logical partition, do not disconnect the power source. If you stopped the system, disconnect the power source from the system by unplugging the system.

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

(L003)



or



Install the disk drive

1. If the slot you want to use contains a disk drive filler, follow these steps:

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
- a. Pull the disk-drive filler from the slot you want to use, as shown in Figure 45 or Figure 46 on page 47.

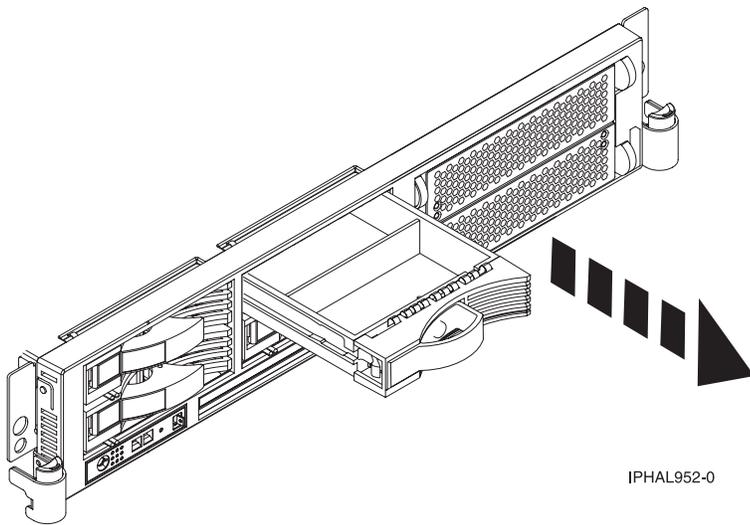


Figure 45. Removing a disk-drive filler from a model 51x or 710

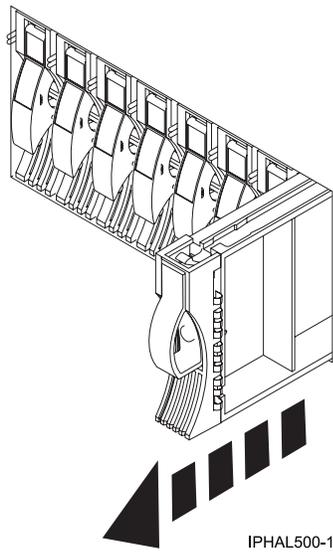


Figure 46. Removing a disk-drive filler from a model 285, 52x, 55x, 9116-561, or 570

b. Pull off the disk-drive bezel latch **A** from the front of the filler, as shown in the following figure.

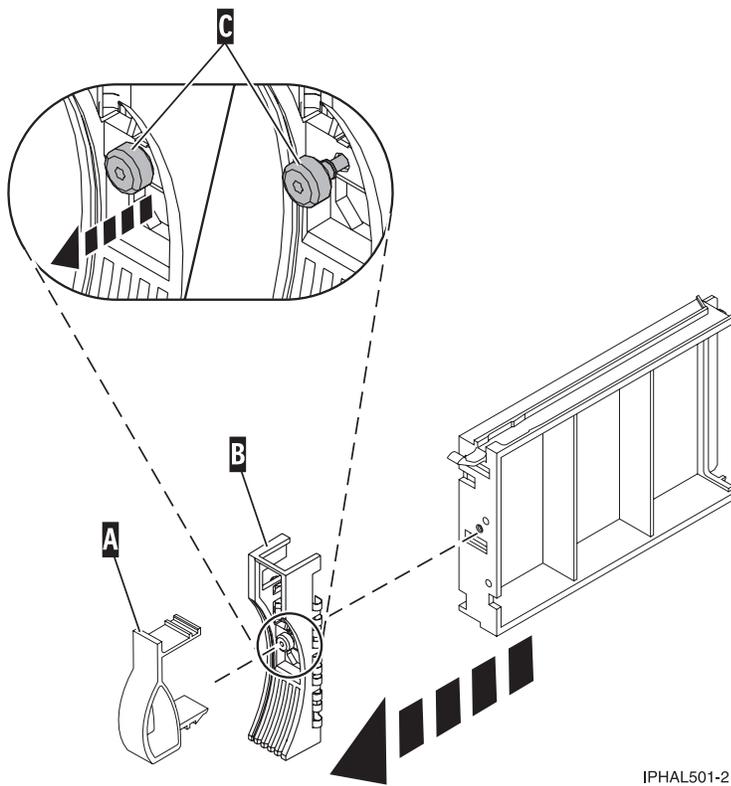
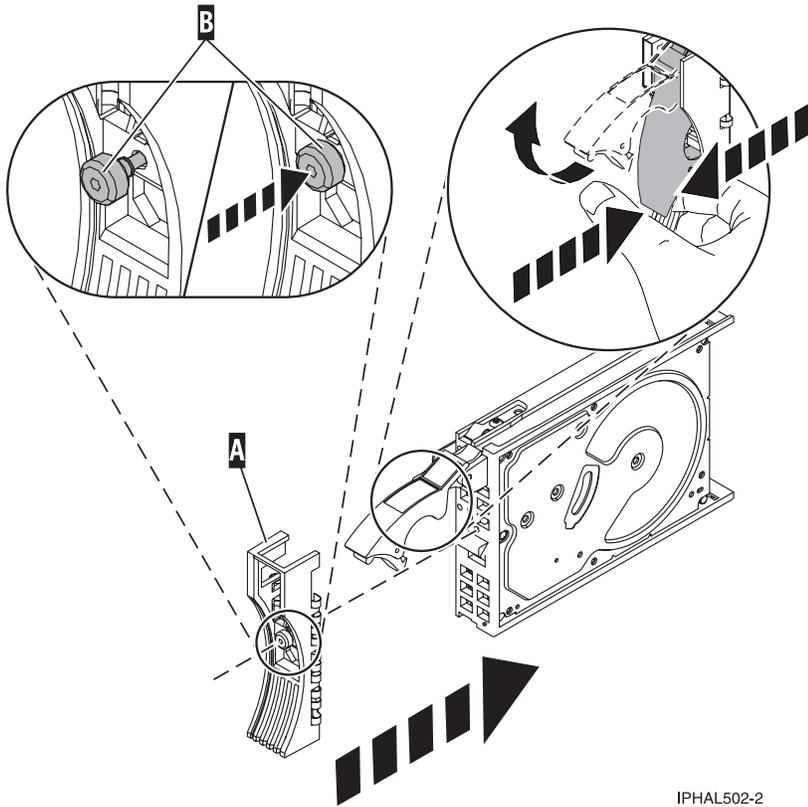


Figure 47. Removing a disk-drive bezel

- c. Loosen, and then pull out on the thumbscrew **C** to release the bezel **B** from the front edge of the filler.
2. Find the package that contains the new disk drive.
 - Attention:** Disk drives are fragile. Handle with care.

3. Remove the disk drive from its protective package. Record the serial number (use the last 4 digits) of the disk drive.
4. Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
5. If your disk drive does not have a bezel preinstalled, follow these steps to install the disk-drive bezel on the new disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.



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Figure 48. Installing a disk-drive bezel

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
6. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
7. Slide the disk drive into the system or expansion unit until it stops.

Note: When installing a disk drive, the drive must be fully seated and all the way into the system.
8. Push the disk drive handle in until it locks, as shown in Figure 49 on page 49 or Figure 50 on page 49.

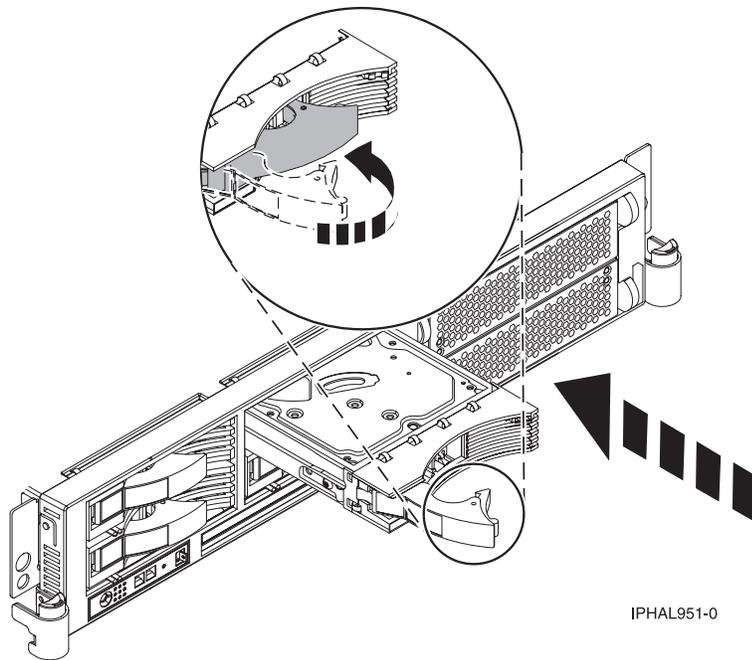


Figure 49. Installing a disk drive in a model 51x or 710

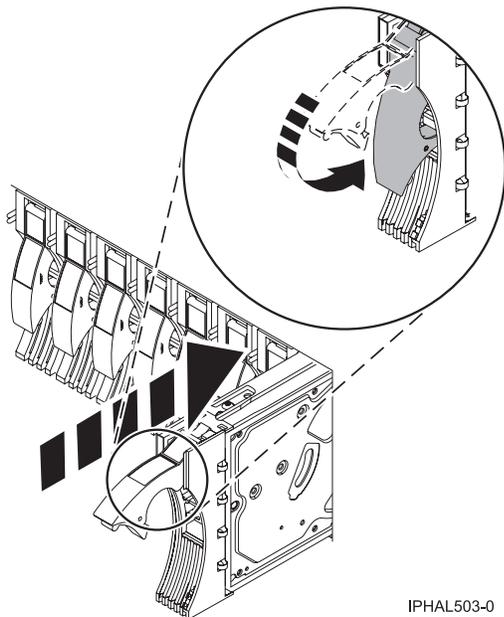


Figure 50. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

9. If you are installing more than one disk drive, repeat step 1 on page 46 through step 8 on page 48 until all disk drives are installed.

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190

- “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
 3. Reconnect all system power cables.
 4. Reconnect the system to the power supply by plugging it into the system.
 5. Start the system or logical partition. For instructions, see “Start the system or logical partition” on page 167.
 6. To configure the newly installed disk drive, select the procedure for the operating system that controls the disk drive.
 - “Prepare a disk drive for use in an AIX system or logical partition” on page 158
 - For information on configuring the newly installed disk drive for a Linux environment, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

Remove a disk drive

You might need to remove a Small Computer System Interface (SCSI) disk drive from the sever or expansion unit. This section includes information about the disk-drive enclosure and procedures so that you can perform these tasks.

To remove and replace a failed disk drive, go to “Replace a disk drive” on page 53. If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a disk drive. For instructions, see “Remove a part using the Hardware Management Console” on page 212.

Remove a disk drive from a system or expansion unit that is controlled by different operating systems.

- “Replace a disk drive with the AIX system or logical partition powered on” on page 53.
- “Replace a disk drive with the Linux system or logical partition powered on” on page 68.

Remove a disk drive from a system or expansion unit controlled by i5/OS

You might need to remove a Small Computer System Interface (SCSI) disk drive from a system or expansion unit with an i5/OS operating system or a logical partition that controls the disk drive location. Use the procedure in this section to perform this task.

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)

1. Before removing a disk drive, back up all the data from the disk drive or the array that the drive is a part of, and then move the data from the disk drive that you want to remove. For instructions, choose one of the following options:
 - Move and remove disk units
 - How to remove a disk drive from an auxiliary storage pool in Backup and Recovery manual  .
2. Prepare to remove the disk drive from the system configuration as described in “Prepare to remove a disk drive from a system or expansion unit controlled by i5/OS” on page 156.
3. Locate the disk drive to be removed. See “Disk drive locations” on page 138.
4. Stop the system or logical partition that controls the disk drive location. For instructions, see “Stop the system or logical partition” on page 169.

Prepare the system

1. Remove the system unit door, expansion unit door, or open the rack. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175

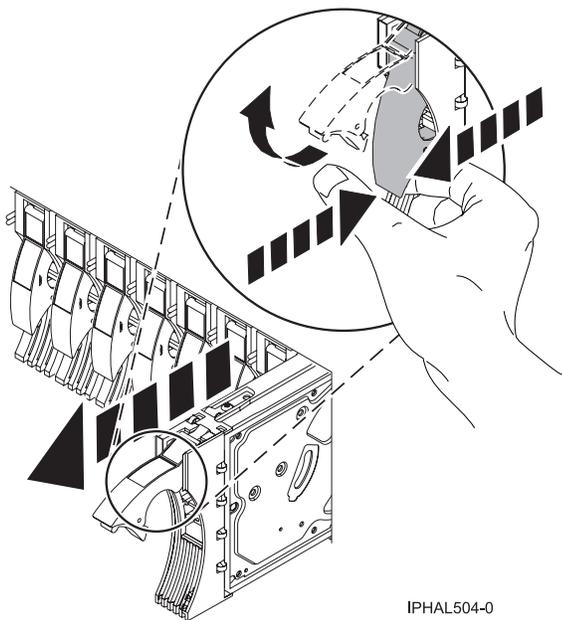
2. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - “Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit” on page 181
 - If you have a front cover from any other models, remove the front cover.

Remove the disk drive

1. Unlock the disk drive handle by squeezing it and pulling it out toward you.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.



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Figure 51. Removing a disk drive

2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
3. If a disk-drive filler is available, follow these steps:

Note: Refill the disk drive slots with either another disk drive or a disk-drive filler. Filling the disk drive slot can help ensure proper airflow for cooling and help maintain optimal EMI compliance.

- a. Attach the disk-drive bezel to the filler.
- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
- c. Install the disk-drive filler in the system or expansion unit.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, install the front cover.
2. Install or close the front door of the system, expansion unit, or rack. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. Reconnect all system power cables.
4. Reconnect the system to the power supply by plugging it into the system.
5. Start the system or logical partition. For instructions, see “Start the system or logical partition” on page 167.

Replace a disk drive

You might need to replace a Small Computer System Interface (SCSI) disk drive in the server or expansion unit. Use the procedures in this section to perform this task.

To remove and replace a disk drive in a different enclosure, use the information for that enclosure.

Use this procedure to remove a failed disk drive and replace it with the same type of disk drive. If you plan to remove a disk drive and install a different type of disk drive, remove the existing disk drive as described in “Remove a disk drive” on page 50, then install the new disk drive as described in “Install a disk drive” on page 16. If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a disk drive. For instructions, see “Replace a part using the Hardware Management Console” on page 213.

Your system or logical partition can be powered off or powered on when you replace the disk drive. If the disk drive that is being replaced is in the AIX or Linux root volume group (rootvg) and does not have disk protection replace your disk with the powered-off procedure.

If you are replacing a model 9116-561 or 570 disk-drive enclosure or SCSI IDE converter card, and if you are planning to use this information in printed form, you need to print the following instructions, as well as this procedure.

- Control panel
- Media device
- Fans

Replace a disk drive with the AIX system or logical partition powered on

You might need to replace a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the AIX operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: The powered-on procedure is a complex set of steps that must be performed exactly to avoid potential data loss or system damage. You might also consider the powered-off procedure, which is a simpler task that involves less risk of data loss or system damage. If the system or logical partition that controls the disk drive you are replacing is at the AIX command line, you can use this powered-on procedure. If the disk drive that you are replacing is in the root volume group (rootvg) and it is not protected by either Redundant Array of Independent Disks (RAID) or mirroring, or to use the powered-off procedure, go to “Replace a disk drive with the system or logical partition powered off” on page 86.

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.

Related information

General AIX diagnostic information

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Prepare to remove the disk drive from the system or expansion unit as described in “Prepare to remove a disk drive from a system or expansion unit controlled by AIX” on page 156.

3. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
4. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, remove the front cover.

To replace a Just a Bunch of Disks (JBOD) disk drive attached to any SCSI or SCSI RAID adapter, see the procedure in “Replace a SCSI disk drive” on page 93.

Remove the disk drive

1. Log in as root user or use the customer engineer (CE) login.
For information on CE Login, go to General AIX diagnostic information.
2. At the command line, type `diag` and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. Select **Hot Plug Task**.
6. Select **SCSI and SCSI RAID Hot Plug Manager** or **RAID Hot Plug Devices**, depending upon the adapter that your drive is attached to.

Tip: One or both of these options may be available, depending upon the configuration of your system. If the drive you want to replace is not listed when you follow the steps for the SCSI and SCSI RAID Hot Plug Manager, go to the RAID Hot Plug Devices procedure.

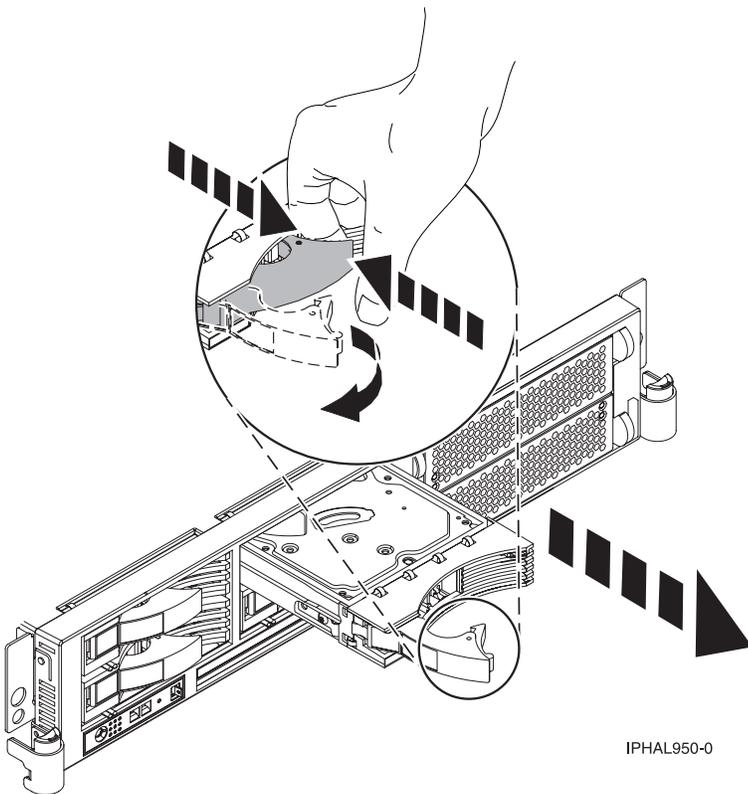
 - If you have a RAID disk drive attached to a 2498 PCI SCSI RAID adapter, continue with step 7.
 - If you have a JBOD disk drive attached to any SCSI or SCSI RAID adapter, go to “Replace a SCSI disk drive” on page 93.
 - If you have RAID drives attached to any other adapter, go to the *PCI-X SCSI RAID Controller Reference Guide for AIX*. This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.
7. Select **RAID Hot Plug Devices**.
8. On the Resource Selection List, select the adapter that is connected to the array that contains the disk drive you want to replace. Press Enter.
9. Select **Commit**.
10. On the Identify and Remove Resources menu, select **Remove**. Press Enter.
A list of the disk drives that you can remove is shown. If the disk drive you want to remove does not appear on the list, ask your system administrator to put the disk drive in the Failed state before continuing with this procedure. For information, see *AIX System Management Guide: Operating System and Devices*. This guide is available at the System p and AIX Information Center (<http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp>).
11. Select the drive that you want to remove and press Enter. The concurrent maintenance light for the slot will flash rapidly.

Attention: If the light does not flash rapidly, do not remove the disk drive.

To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

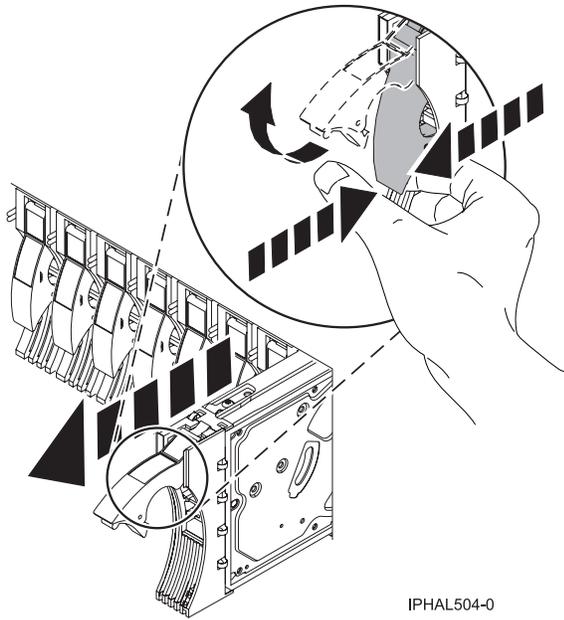
- “Disk-drive concurrent maintenance lights for model 505” on page 153
- “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
- “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
- “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
- “Disk-drive concurrent maintenance lights for model 575” on page 154
- “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
- “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155

12. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown in Figure 52 and Figure 53 on page 57.



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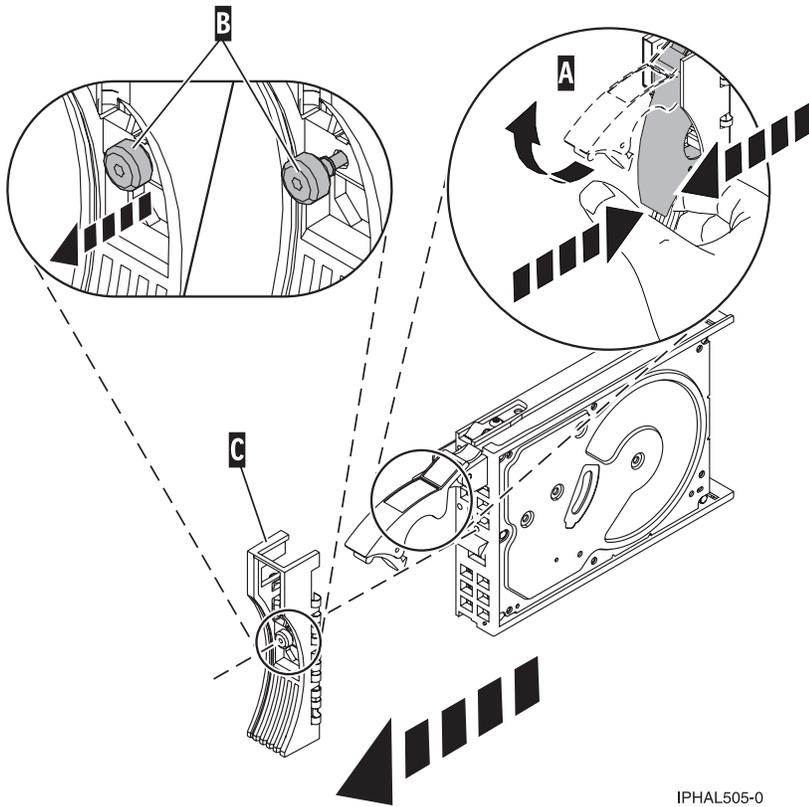
Figure 52. Removing a disk drive from a model 51x or 710



IPHAL504-0

Figure 53. Removing a disk drive from a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

13. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
The concurrent maintenance light for the slot turns off when you remove the disk drive.
14. If your new disk drive does not have a bezel preinstalled, then perform the following step.
Loosen and pull out on the thumbscrew **B** to release the bezel **C** from the disk drive, as shown in the following figure.

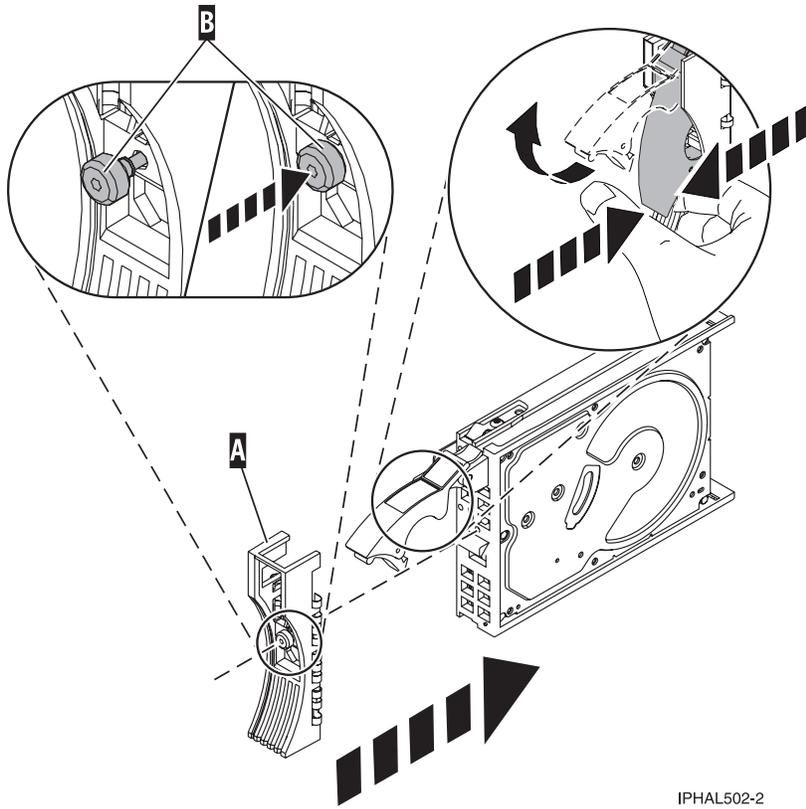


IPHAL505-0

Figure 54. Removing a disk-drive bezel

Replace the disk drive

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



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Figure 55. Installing a disk-drive bezel

6. Install the disk drive as shown in Figure 56 on page 60 or Figure 57 on page 60.
 - a. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 - b. Slide the disk drive into the system until it stops.

Important: Ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

- c. Push the disk drive handle in until it locks.

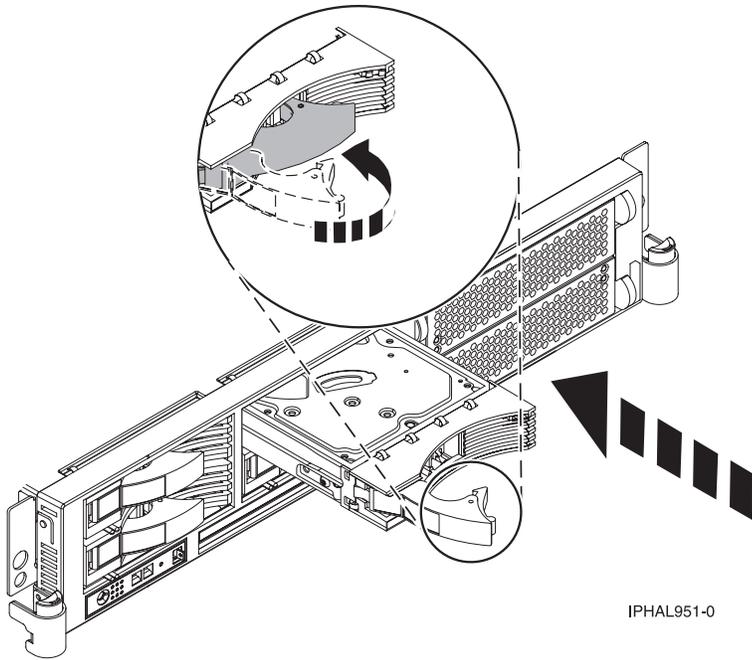


Figure 56. Installing a disk drive in a model 51x or 710

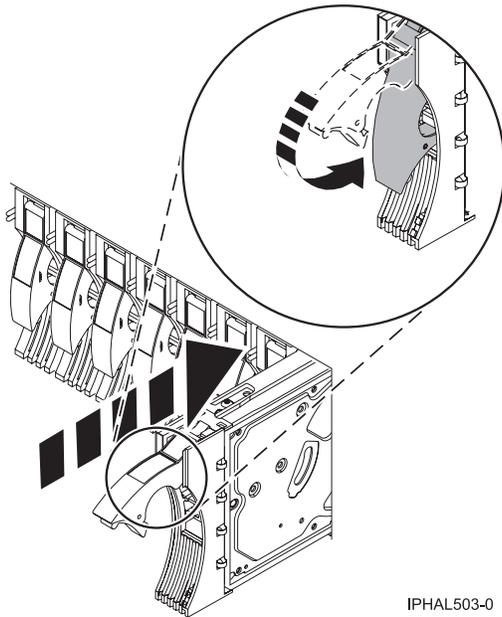


Figure 57. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

7. Press Enter. The disk drive slot exits the Remove state and enters the Normal state.
8. Exit to the RAID Hot-Plug Devices menu. Press F3 to return.
9. Exit to the Task selection display.
10. Select **Log Repair Action**.
11. Select the disk drive that you replaced and then press Enter.
12. Select **Commit** after you have made your selection and then press Enter.
13. Exit to the command line.

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, install the front cover.
2. Install or close the front door of the system, expansion unit or rack. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. To prepare the disk drive for use, go to “Rebuild data on a replacement disk drive using AIX” on page 160.

Replace a disk drive with the i5/OS system or logical partition powered on

You might need to replace a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the i5/OS operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: The powered-on procedure is a complex set of steps that must be performed exactly to avoid potential data loss or system damage. You might also consider the powered-off procedure, which is a simpler task that involves less risk of data loss or system damage. For instructions, see “Replace a disk drive with the system or logical partition powered off” on page 86.

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.

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:

- “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
- “Remove the front cover from the model 9116-561 or 570” on page 192
- “Remove the front cover from the 7311-D20 expansion unit” on page 196
- “Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit” on page 181
- If you have a front cover from any other models, remove the front cover.

Remove the disk drive

1. Locate the disk drive to be replaced and record the location information, then use the location information to activate the identify light for that disk drive. For instructions, see “Identify a failing part on an i5/OS system or logical partition” on page 216.
2. Verify that the disk drive you are replacing has been suspended before continuing with this procedure. For instructions, see “Prepare to remove a disk drive from a system or expansion unit controlled by i5/OS” on page 156.
3. Did you find the service action log entry related to this problem?
 - **No:** Exit the service action log and go to step 5.
 - **Yes:** Continue with the next step.
4. Choose the concurrent maintenance option. This option fills in the disk drive location on the concurrent maintenance display. Go to step 7 on page 64.
5. Select **Device Concurrent Maintenance** from the Hardware Service Manager display. Press Enter. The Device Concurrent Maintenance display is shown, as shown in the following figure.

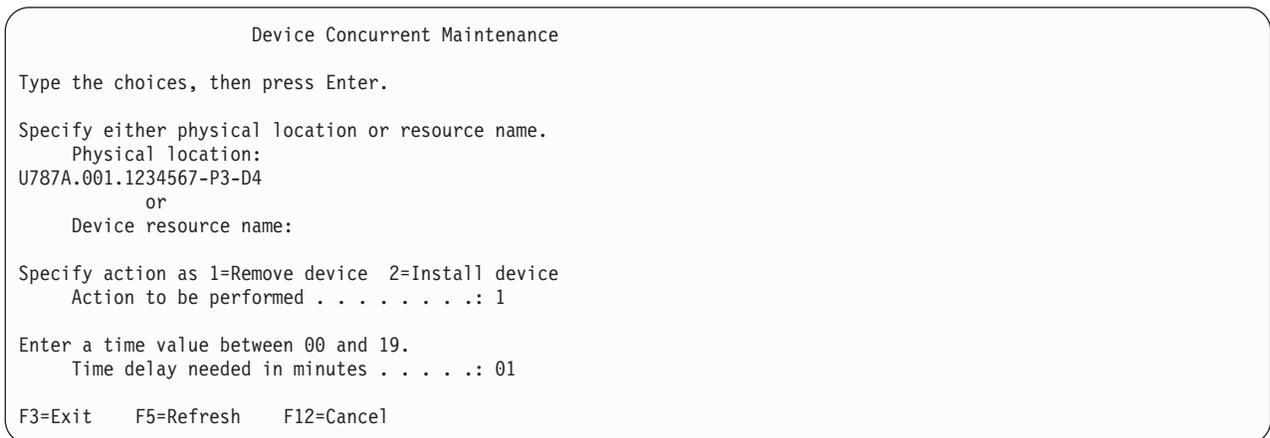


Figure 58. Example Device Concurrent Maintenance display

6. If the physical location does not appear in the Device Concurrent Maintenance display, type the physical location where you will be replacing the disk drive as shown in the preceding example, Figure 58.
 The physical location has the following form: U787A.001.AAAXXX-P3-D4 where P3-D4 is the position of the disk drive in the system unit or expansion unit. You can get the U787A.001.AAAXXX location information from the control panel display on the system unit or expansion unit.
 If you cannot get the information from the control panel, find the feature code (FC) and sequence number (SN or SEQ) on the label that appears on the front of the system unit or expansion unit as shown in the following figure.



Figure 59. Example system or expansion unit label

In this example, U787A.001.AAAXXX-P3-D4, U787A.001 comes from the feature code (FC) on the label, AAAXXX comes from the last seven digits of the sequence number (SN or SEQ) on the label, and P3-D4 is the slot where you are replacing the disk drive as shown in “Disk drive locations” on page 138.

In the example, U5074.001.AAAXXX-DB3-D32, you would replace a disk drive in the expansion unit with type 5074, model 001, sequence number AAAXXX, and disk drive position DB3-D32.

7. Select option 1 (Remove device) for the **Action to be performed**.
8. Set the time delay for one minute: 01.

Important: Do not press Enter at this time.

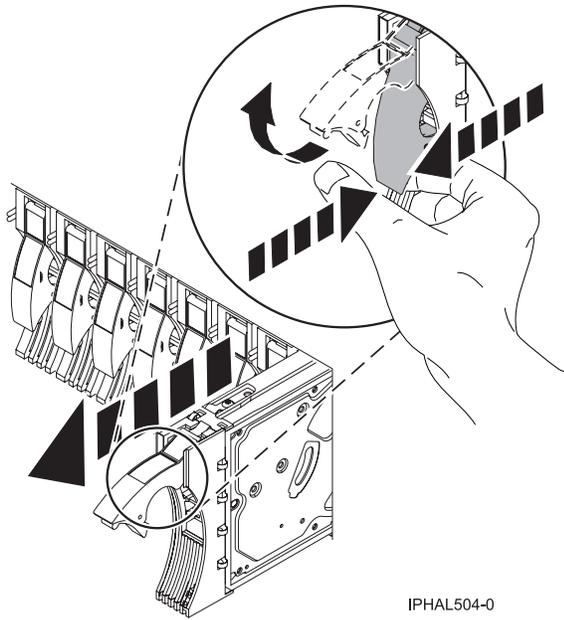
9. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:
 - “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
 - “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
 - “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155

Important: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive.

10. Press Enter on the console.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
11. When the concurrent maintenance light starts blinking, squeeze and pull the handle of the disk drive out toward you before you remove the disk drive, as shown in the following figure. If the handle is not all the way out, the disk drive cannot slide out of the system or expansion unit.



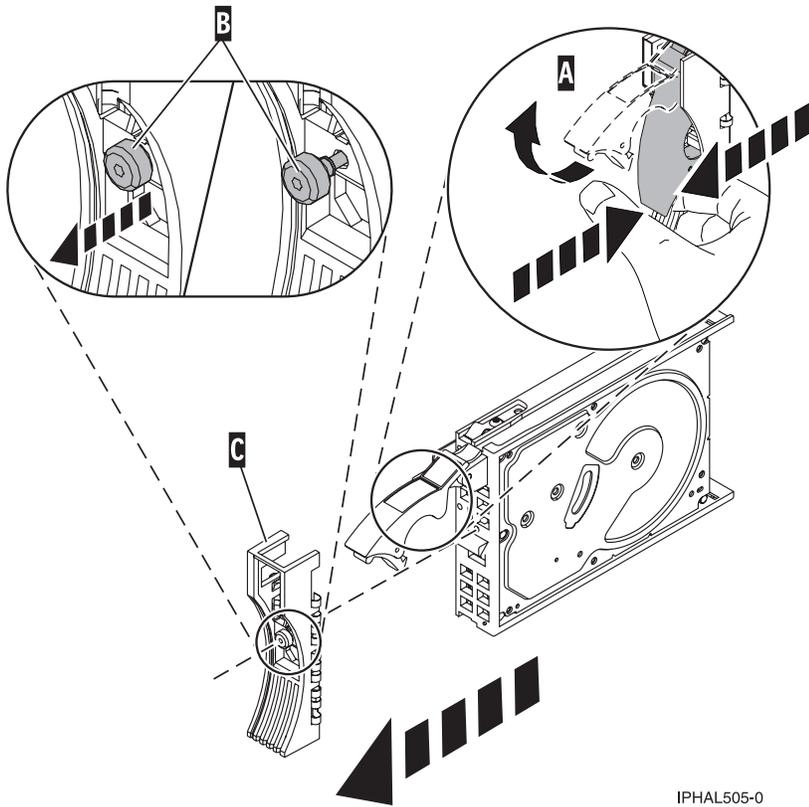
IPHAL504-0

Figure 60. Removing a disk drive

12. Support the bottom of the disk drive as you slide it out of the system. Do not hold the disk drive by the handle.

Note: The concurrent maintenance light will stop blinking and remain off when the disk drive is removed.

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



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Figure 61. Removing a disk-drive bezel

Replace the disk drive

1. Return to the console and wait until the Concurrent Maintenance Results display is shown.
Press F12.
2. The physical locations you entered in step 6 on page 63 of this procedure might still appear on the display. If not, retype the physical location where you will be installing the new disk drive.
In the example, U787A.001.1234567-P3-D4, you would install a disk drive in the system unit with type 9406, Model 520, sequence number 1234567, and disk drive position P3-D4.
In the example, U5074.001.1234567-DB3-D32, you would install a disk drive in the expansion unit with type 5074, model 001, sequence number 1234567, and disk drive position DB3-D32.
3. Select option 2 (Install device) for the Action to be performed.
4. Set the time delay for one minute:01.

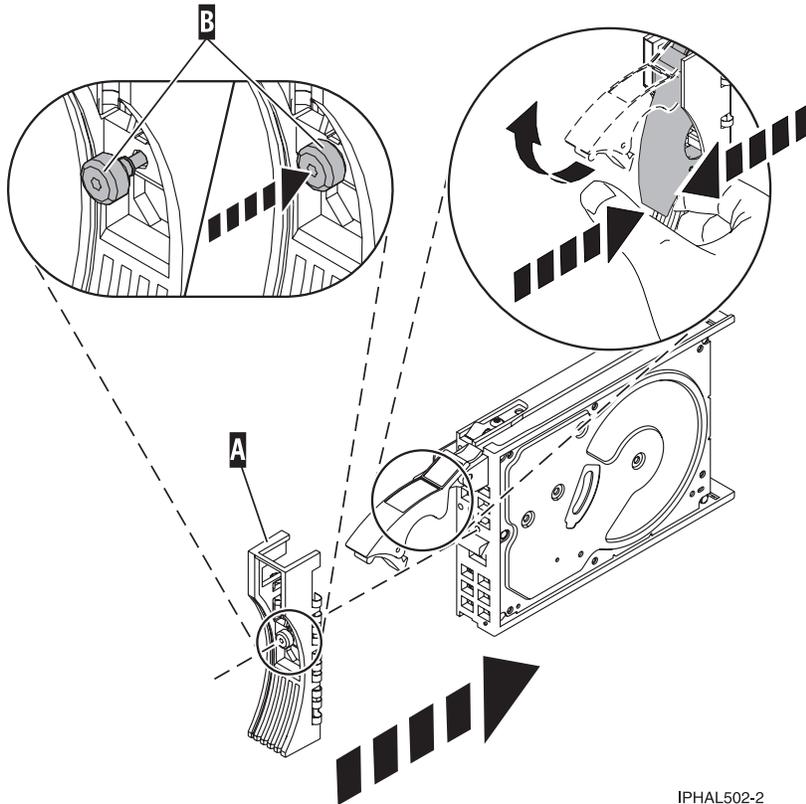
Important: Do not press Enter at this time.

5. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.

Important: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to slide the disk drive all the way in and then lock it in place by pushing in the disk drive handle.

6. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
7. Remove the disk drive from its protective package.

8. Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive can not slide into the system or expansion unit.
9. Follow these steps to install the disk-drive bezel on the replacement disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.
 - b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



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Figure 62. Installing a disk-drive bezel

10. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
11. Slide the disk drive halfway into the system or expansion unit.
12. Press Enter on the console.
13. When the light starts blinking, slide the disk drive all the way in. Then, lock the disk drive in place by pushing in the disk drive handle, as shown in the following figure.

Note: The light stops blinking and remains on when you have installed the disk drive properly.

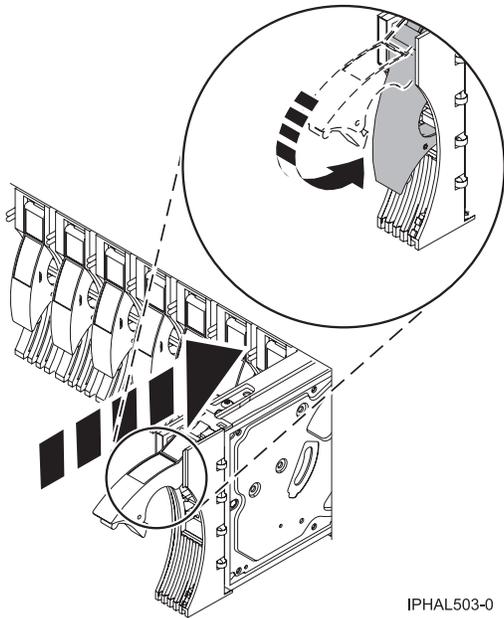


Figure 63. Installing a disk drive

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - “Install the front cover on the 7311-D11, 5791, or 5794 expansion unit” on page 182
 - If you have a front cover from any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press Enter.
4. If you return to the Service Action Log display, exit the service action log.
5. When the Hardware Service Manager display is shown, press F3.
6. To complete this procedure, go to “Rebuild data on a replacement disk drive using i5/OS” on page 160.

Replace a disk drive with the Linux system or logical partition powered on

You might need to replace a Small Computer System Interface (SCSI) disk drive in a system or expansion unit while the Linux operating system or logical partition that controls the disk drive location is powered on. Use the procedure in this section to perform this task.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: Read these instructions carefully and understand the complexity of the powered-on procedure before you begin. If the system or logical partition that controls the disk drive you are replacing is at the Linux command line, you can use this powered-on procedure.

Go to “Replace a disk drive with the system or logical partition powered off” on page 86, if:

- You are installing a disk drive in a 5791, 5794, or 7040-61D expansion unit
- You are installing a disk drive that will be connected with the 6203 or 6204 SCSI adapter
- You do not feel comfortable using the powered-on procedure

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.

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Is the disk drive you are replacing in a redundant array of independent disk (RAID) 0 array or is the disk drive you are replacing in a failed RAID level 5 or 10 array?

- If yes, you must delete the disk array before replacing the disk. For instructions, see *PCI-X SCSI RAID Controller Reference Guide for Linux*.
This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.
 - If no, your drive is configured as Just a Bunch of Disks (JBOD) or is configured within a degraded array. Proceed to the next step.
3. If the disk drive you are replacing is in a redundant array of independent disk (RAID) Level 0 disk array or in a failed RAID Level 5 or RAID Level 10 disk array, you must delete the disk array before replacing the disk. For instructions, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.
 4. Remove the system unit door or expansion unit door or open the rack front door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
 5. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.

To replace a disk drive in a location with the Linux system or logical partition that controls the disk drive location powered on, select the appropriate procedure from the following list:

Replace the disk drive using Linux kernel 2.4

Learn how to replace a disk drive in a location that is controlled by a system or logical partition that is running Linux kernel 2.4.

Prepare to remove the disk drive:

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter. The Work with Disk Units display is shown.
3. From the Work with Disk Units display, select **Analyze log**. Press Enter. The Kernel Messages Log display is shown, similar to the following display.

```

Kernel Messages Log

Select one of the following:

1. Use vi to view most recent IBM Storage error messages
2. Use vi to view IBM Storage error messages
3. Use vi to view all kernel error messages
4. Use vi to view sisconfig error messages
5. Set root kernel message log directory
6. Set default editor
7. Restore defaults
8. Use vi to view IBM Storage boot time messages

Selection:

e=Exit

```

Figure 64. Kernel Messages Log

4. From the Kernel Messages Log display, select **Use vi to view most recent IBM Storage error messages**. Press Enter.
5. Find the device error log entry for the disk drive you want to replace.
6. Record the location information for the disk drive. The location information has the form of P1-I2/Z1-A5.
7. Exit to the Work with Disk Units display.
8. Select **Display disk hardware status** from the Work with Disk Units display. Press Enter.
9. Record the hardware status of the disk drive you want to replace.
10. Type d (Display disk unit details) next to the disk drive you want to replace.
11. On the Display Disk Unit Details display, type 5 (Display hardware resource information details) next to the disk drive you want to replace.

The Disk Unit Hardware Resource Information Details display is shown, similar to the following display.

```

Disk Unit Hardware Resource Information Details

Manufacturer. . . . . : IBM
Machine Type and Model. . . . : IC35L073UCDY10-0
Firmware Version. . . . . : 53323846
Model . . . . . : 020
Serial Number . . . . . : E6VKUNPD
Capacity. . . . . : 73.41 GB
Resource Name . . . . . : /dev/sda

Physical location:
Location . . . . . : U1.9-P1/Z1-A8
PCI Bus. . . . . : 257
PCI Device . . . . . : 1
SCSI Host Number . . . . . : 0
SCSI Channel. . . . . : 0
SCSI Id. . . . . : 8
SCSI Lun. . . . . : 0

Press Enter to continue.

e=Exit      q=Cancel      v=Display Extended VPD

```

Figure 65. Disk Unit Hardware Resource Information Details display

12. Record the physical location information.
13. Exit to the Work with Disk Units display.

- If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.

For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

Remove the disk drive:

- From the Work with Disk Units display, select **Work with disk unit recovery**. Press Enter.
- From the Work with Disk Unit Recovery display, select **Device Concurrent maintenance**. Press Enter. A Device Concurrent Maintenance display is shown, similar to the following display.

```

Device Concurrent Maintenance

Type the choices, then press Enter.

Specify either Physical Location or PCI/SCSI location.
Physical Location: U0.1-P1-I4/Z1-A8
OR
PCI/SCSI . . . PCI Bus:      PCI Device:
                SCSI Channel:  SCSI Id:   SCSI Lun:

Specify action as  1=Remove device  2=Install device
Action to be performed . . . . . : 1

Enter a time value between 01 and 19.
Time needed in minutes . . . . . : 1

Or leave blank and press Enter to cancel

```

Figure 66. Example Device Concurrent Maintenance display

- Enter either the physical location information or the PCI or SCSI location for the disk drive you want to replace. Press Enter.
- Specify 1 (Remove device) for the action to be performed.
- Enter a time value in minutes, allowing enough time for you to remove the disk drive.

The concurrent maintenance light indicates that you can remove the disk drive. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

- “Disk-drive concurrent maintenance lights for model 505” on page 153
- “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
- “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
- “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
- “Disk-drive concurrent maintenance lights for model 575” on page 154
- “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
- “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155

- Press Enter.

A Device Concurrent Maintenance Action display is shown, similar to the following display.

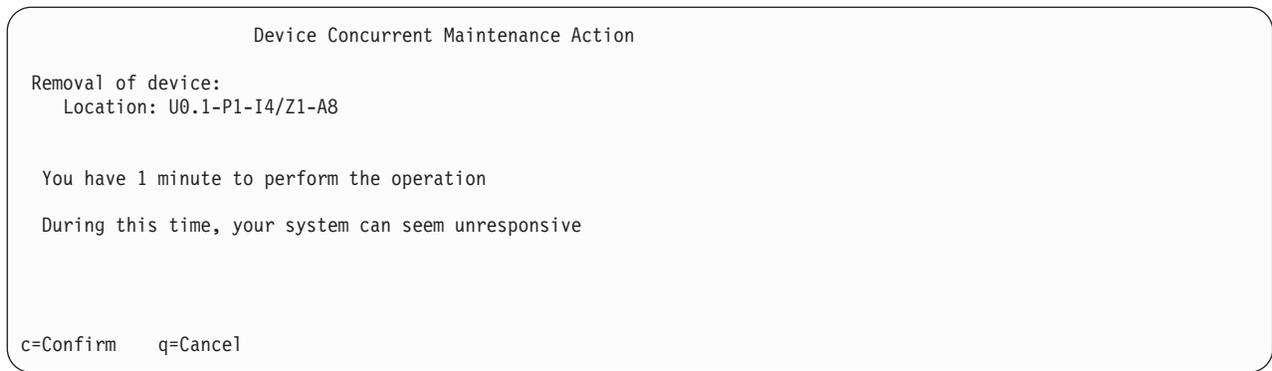


Figure 67. Example Device Concurrent Maintenance Action display

7. Enter c to confirm that you want to remove the disk drive at the specified location. A Device Concurrent Maintenance Action In Progress display is shown, similar to the following display.



Figure 68. Example Device Concurrent Maintenance Action In Progress display

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
8. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive, as shown in Figure 69 on page 74 or Figure 70 on page 74. If the handle is not all the way out, the disk drive can not slide out of the system or expansion unit.

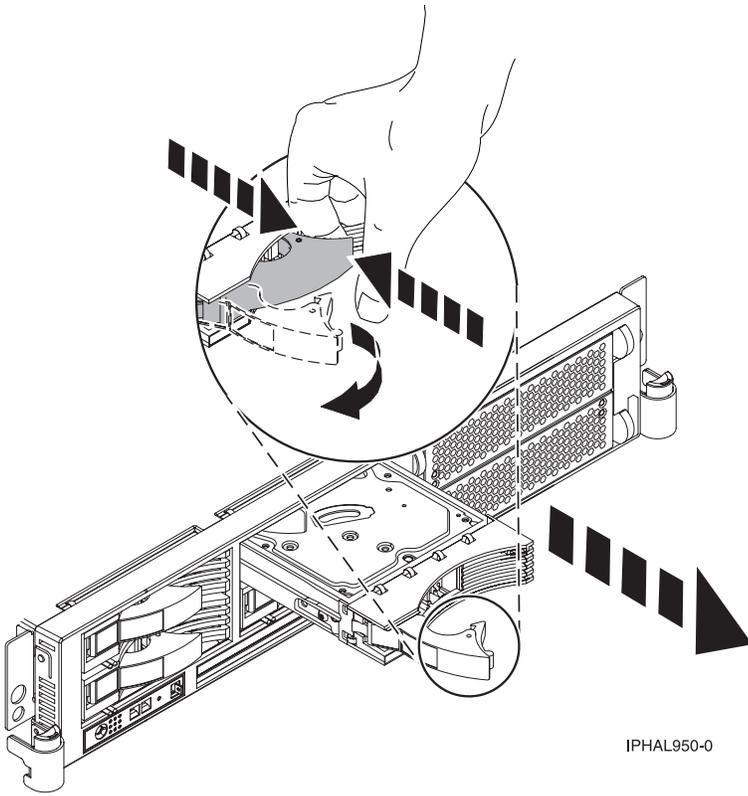


Figure 69. Removing a disk drive from a model 51x or 710

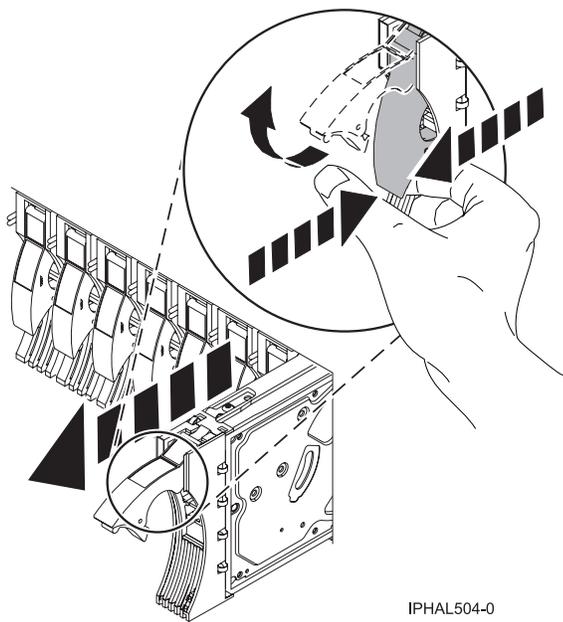
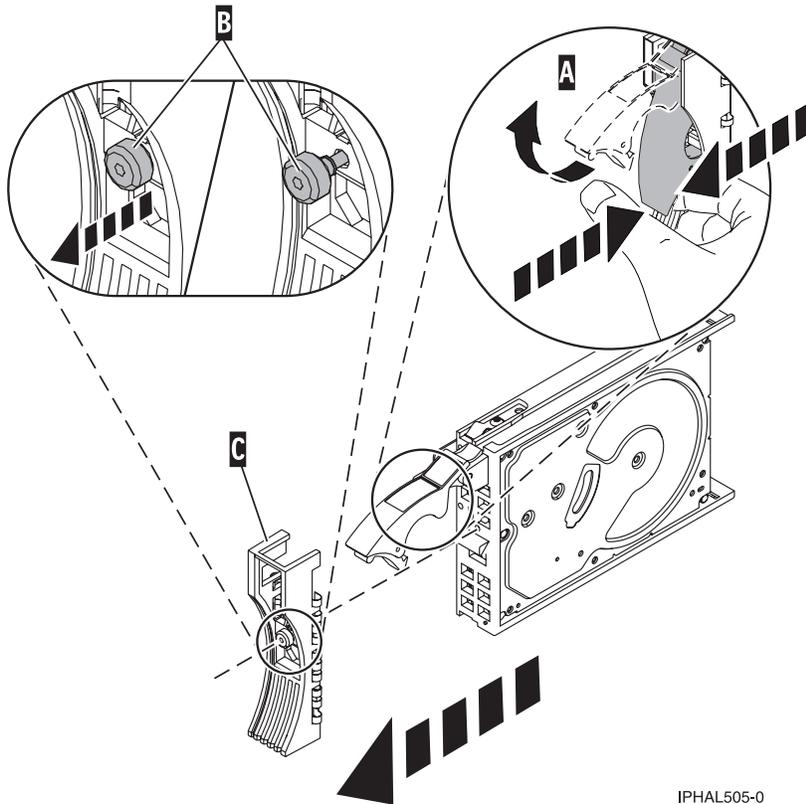


Figure 70. Removing a disk drive from a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

9. Support the bottom of the disk drive as you slide it out of the system. Do not hold the disk drive by the handle.

Note: The concurrent maintenance light for the slot will stop blinking and remain off when you remove the disk drive.

10. Press Enter.
11. If your replacement disk drive does not have a bezel preinstalled, then perform the following step.
Loosen and pull out on the thumbscrew **B** to release the disk-drive bezel **C** from the disk drive, as shown in the following figure.

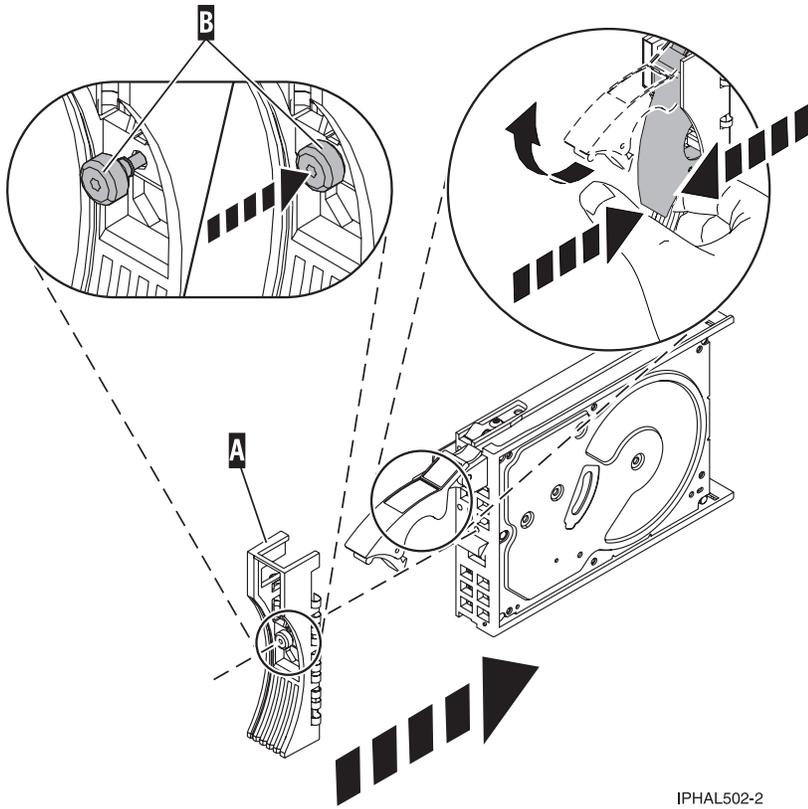


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Figure 71. Removing a disk-drive bezel

Replace the disk drive:

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



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Figure 72. Attaching a bezel to the disk drive

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
5. Select **Device Concurrent maintenance** from the Work with Disk Unit Recovery display. Press Enter.
6. Enter either the physical location code or the PCI/SCSI location from which you removed the disk drive. Press Enter.
7. Specify action as 2 (Install device).
8. Enter a time value in minutes, allowing enough time for you to install the new disk drive.
The concurrent maintenance light for the slot indicates that you can install the disk drive.
9. Press Enter. A Device Concurrent Maintenance Action display is shown, similar to the following display.

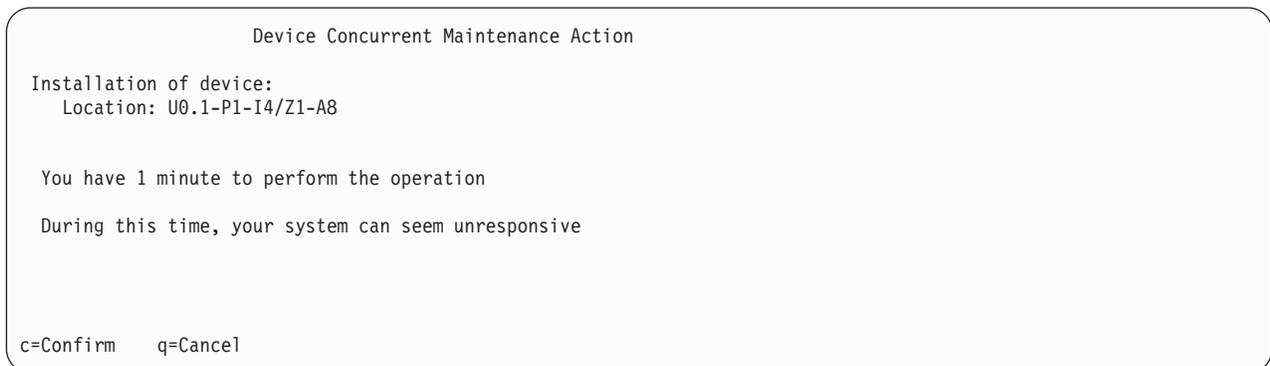


Figure 73. Example Device Concurrent Action Maintenance display

10. Enter c to confirm that you want to install the disk drive in the specified location.

A Device Concurrent Maintenance Action In Progress display similar to the following is shown.

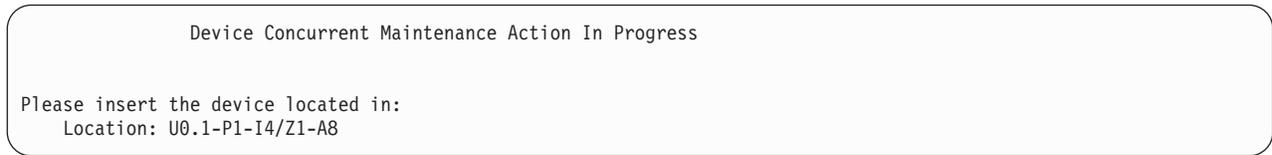


Figure 74. Example Device Concurrent Maintenance Action In Progress display

11. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
12. Slide the disk drive all the way in into the system or expansion unit and then lock it in place by pushing in the disk drive handle as shown in Figure 75 or Figure 76 on page 78.

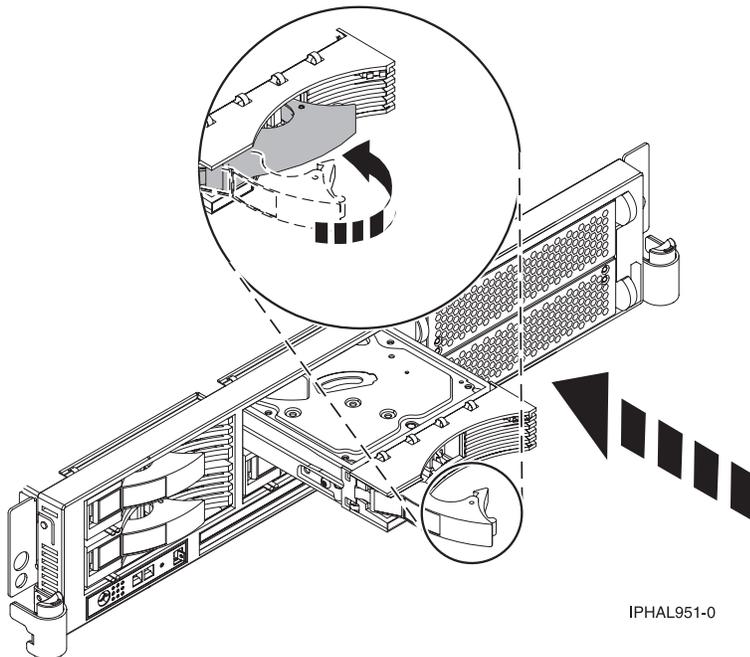
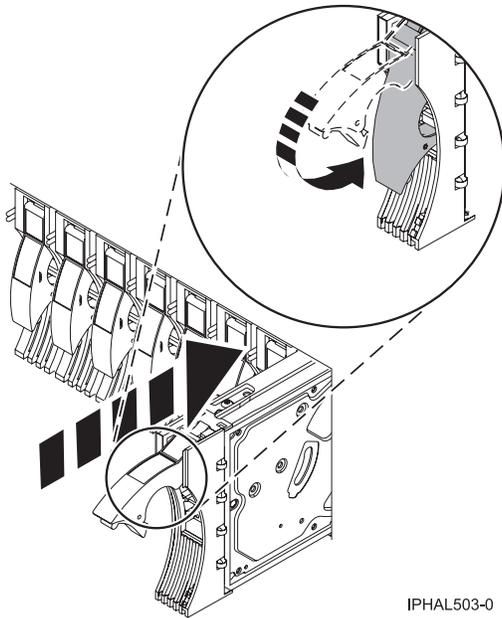


Figure 75. Installing a disk drive in a model 51x or 710



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Figure 76. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

The concurrent maintenance light for the slot stops blinking and remains on when you have installed the disk drive properly.

13. Rebuild the data on the replacement disk drive. For instructions, go to “Rebuild data on a replacement disk drive using Linux” on page 161.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have any other models, install the front cover.
2. Install or close the system, expansion unit, or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.

Replace the disk drive using Linux kernel 2.6

Learn how to replace a disk drive in a location that is controlled by a system or logical partition that is running Linux kernel 2.6.

Prepare to remove the disk drive:

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



Figure 77. Kernel Messages Log

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

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

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

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

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

```

Display Hardware Status

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

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

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

```

Figure 78. Example Display Hardware Status

12. Look for the disk drive at the PCI location you recorded. The disk drive might have a Failed status.
13. If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.

For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

14. Type option 1 (Display hardware resource information details) next to the disk drive you want to replace. Press Enter.

A Disk Hardware Resource Information Details display similar to the following is shown.

```

Disk Unit Hardware Resource Information Details

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

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

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

Press Enter to Continue

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

```

Figure 79. Example Disk Hardware Resource Information Details display

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

Remove the disk drive:

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

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

Figure 80. Example Concurrent Device Remove display

3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:
 - “Disk-drive concurrent maintenance lights for model 505” on page 153
 - “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
 - “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
 - “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

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

6. The Complete Device Concurrent Remove display is shown.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
7. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive as shown in Figure 81 on page 82 or Figure 82 on page 82. If the handle is not all the way out, the disk

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

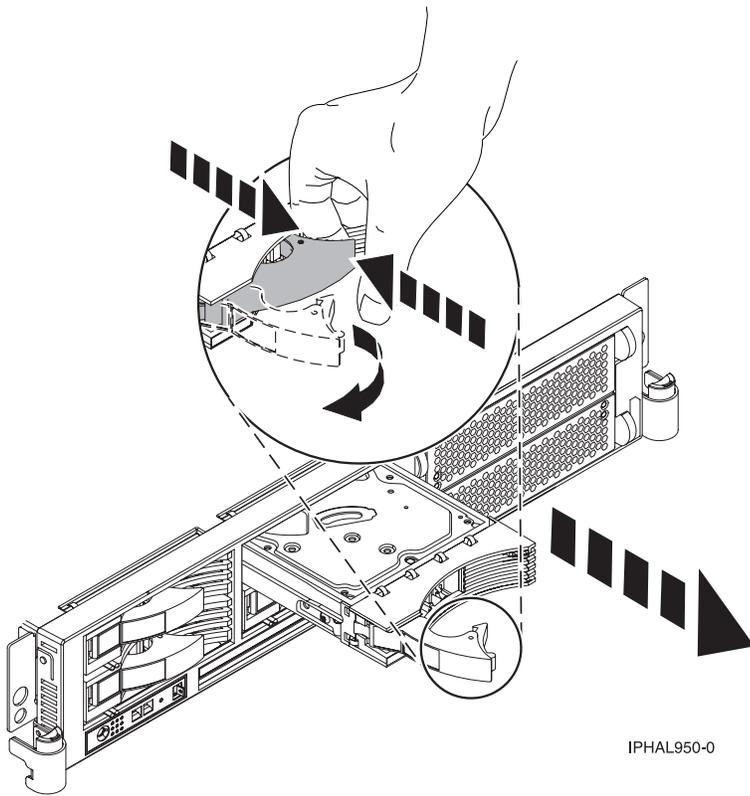


Figure 81. Removing a disk drive from a model 51x or 710

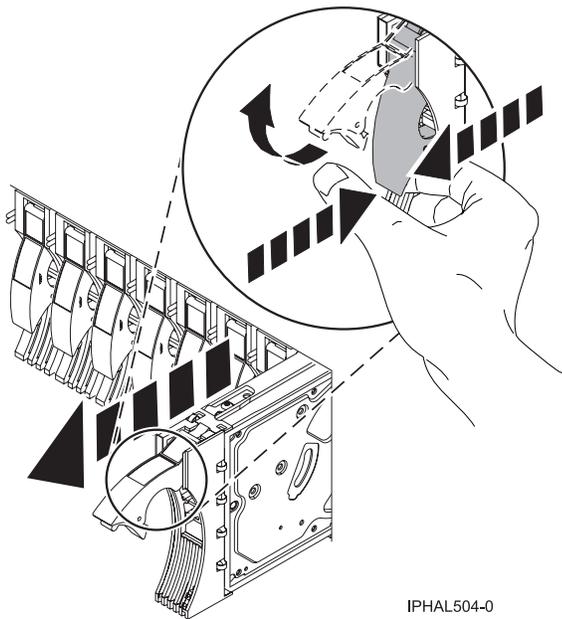
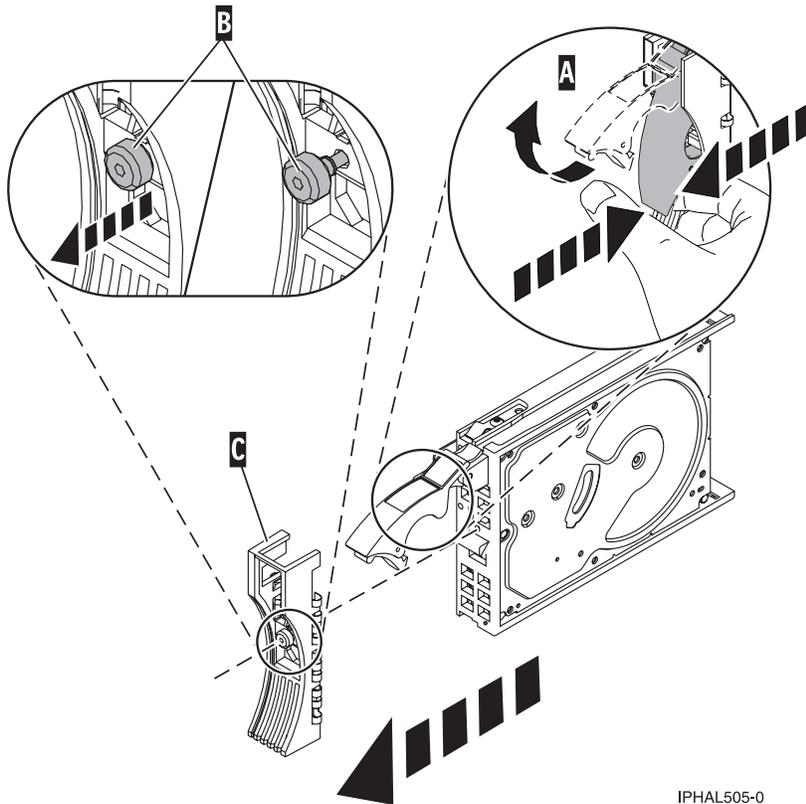


Figure 82. Removing a disk drive from a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

8. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
9. If your replacement disk drive does not have a bezel preinstalled, then perform the following step.

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



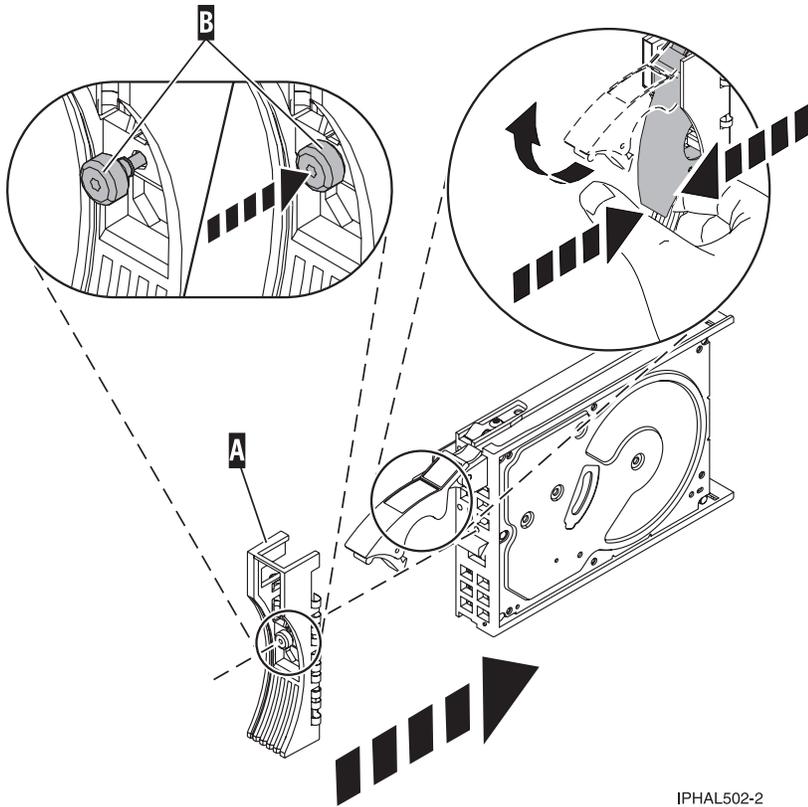
IPHAL505-0

Figure 83. Removing a disk-drive bezel

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

Replace the disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle them with care.
2. Remove the disk drive from its protective package.
3. Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
4. If your replacement disk drive does not have a bezel preinstalled, then follow these steps to install the disk-drive bezel on the replacement disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.
 - b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



IPHAL502-2

Figure 84. Attaching a bezel to the disk drive

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

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

Figure 85. Example Concurrent Device Add display

7. Type option1 (Select) next to the location from which you removed the disk drive. The Verify Device Concurrent Add display is shown.
8. Press Enter on the Verify Device Concurrent Add display. The Complete Device Concurrent Add display is shown.
9. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
10. Slide the disk drive all the way into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 86 on page 85 or Figure 87 on page 85.

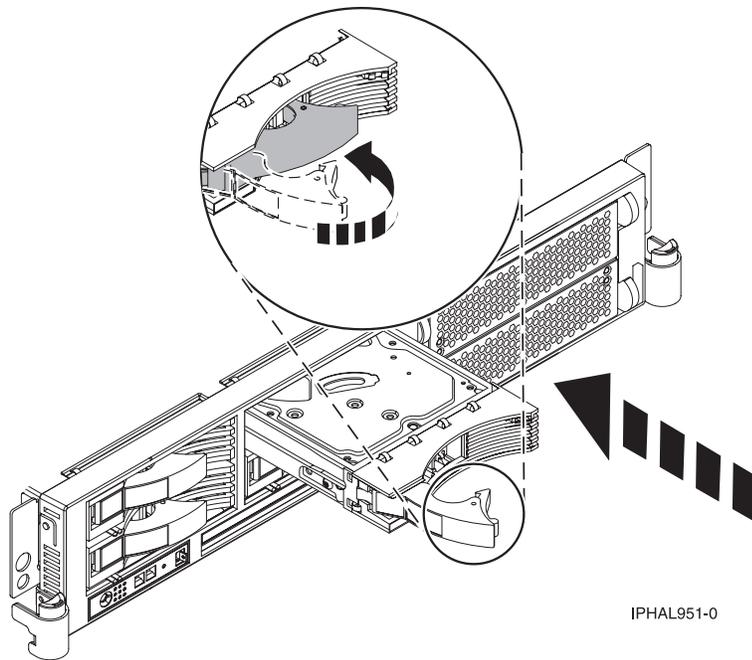


Figure 86. Installing a disk drive in a model 51x or 710

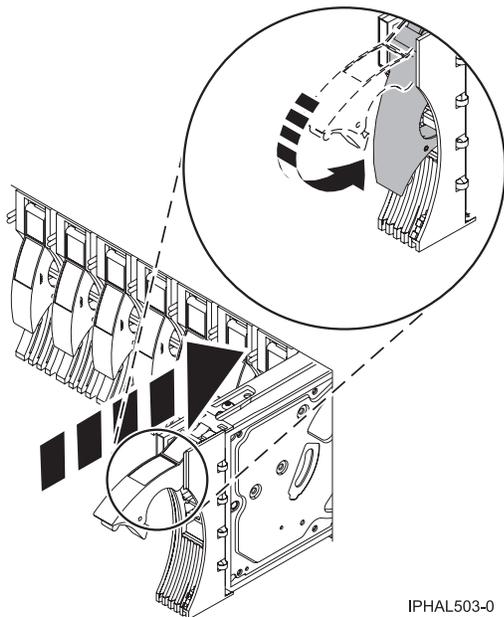


Figure 87. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

11. Press Enter on the Complete Device Concurrent Add display to indicate that the disk drive is installed.
12. Rebuild the data on the replacement disk drive. For instructions, go to "Rebuild data on a replacement disk drive using Linux" on page 161.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:

- “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.

Replace a disk drive with the system or logical partition powered off

You might need to install a Small Computer System Interface (SCSI) disk drive in a system or logical partition that controls the disk drive location with the power off. Use the procedure in this section to perform this task.

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)

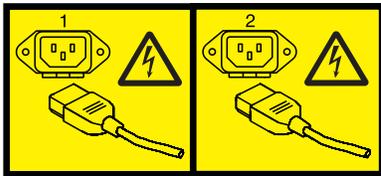
Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.

2. If you cannot start the system or logical partition that controls the disk drive location, or if the system or logical partition are not powered on, go to step 6.
3. Identify the disk drive to be replaced and record the location information. For information, see "Identify a failing part" on page 214.
4. Prepare to remove the disk drive from the system or expansion unit as follows:
 - If the system or logical partition that controls the disk drive location is running AIX, follow the steps in "Prepare to remove a disk drive from a system or expansion unit controlled by AIX" on page 156.
 - If the system or logical partition that controls the disk drive location is running i5/OS, follow the steps in "Prepare to remove a disk drive from a system or expansion unit controlled by i5/OS" on page 156.
 - If the system or logical partition that controls the disk drive location is running Linux and the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure. For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
 This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.
5. Stop the system or logical partition that controls the disk drive location. For instructions, see "Stop the system or logical partition" on page 169.
6. If you stopped the logical partition, do not disconnect the power source. If you stopped the system, 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 all power sources to the system have been completely disconnected.

(L003)



or



7. Remove the system unit door or expansion unit door or open the rack front door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
8. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.

Remove the disk drive

1. Unlock the disk drive handle by squeezing it and pulling it out toward you, as shown in Figure 88 on page 89 or Figure 89 on page 89.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

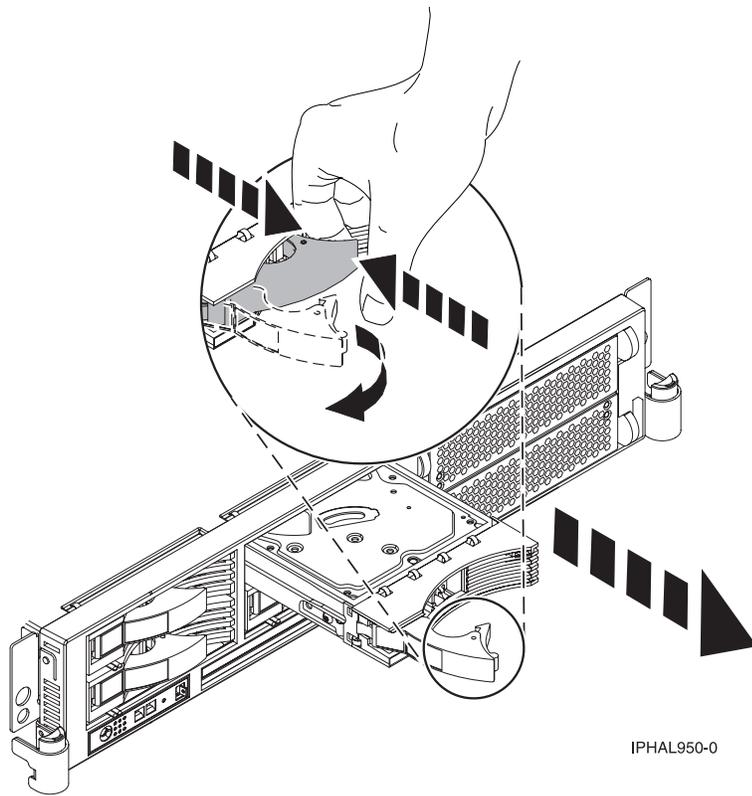


Figure 88. Removing a disk drive from a model 51x or 710

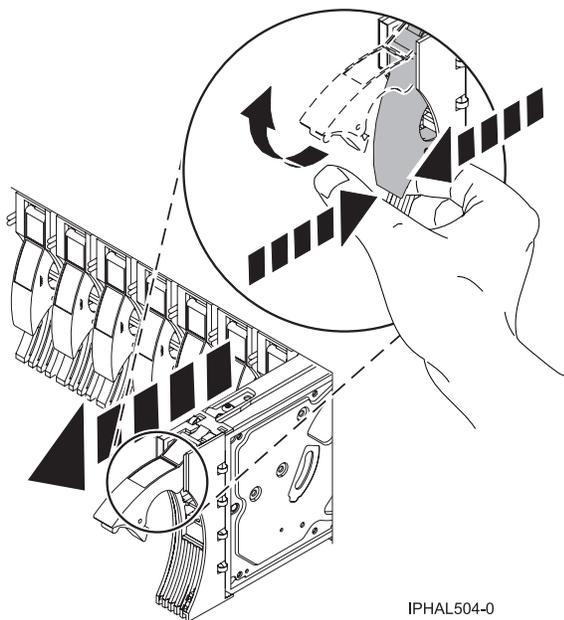
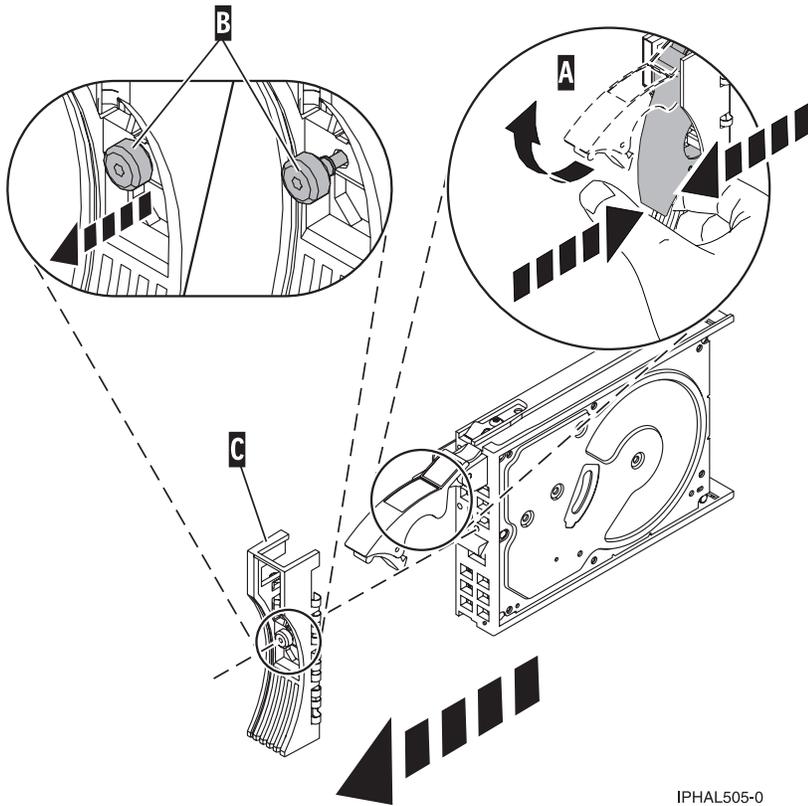


Figure 89. Removing a disk drive from a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
3. If your replacement disk drive does not have a bezel preinstalled, then perform the following step.

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

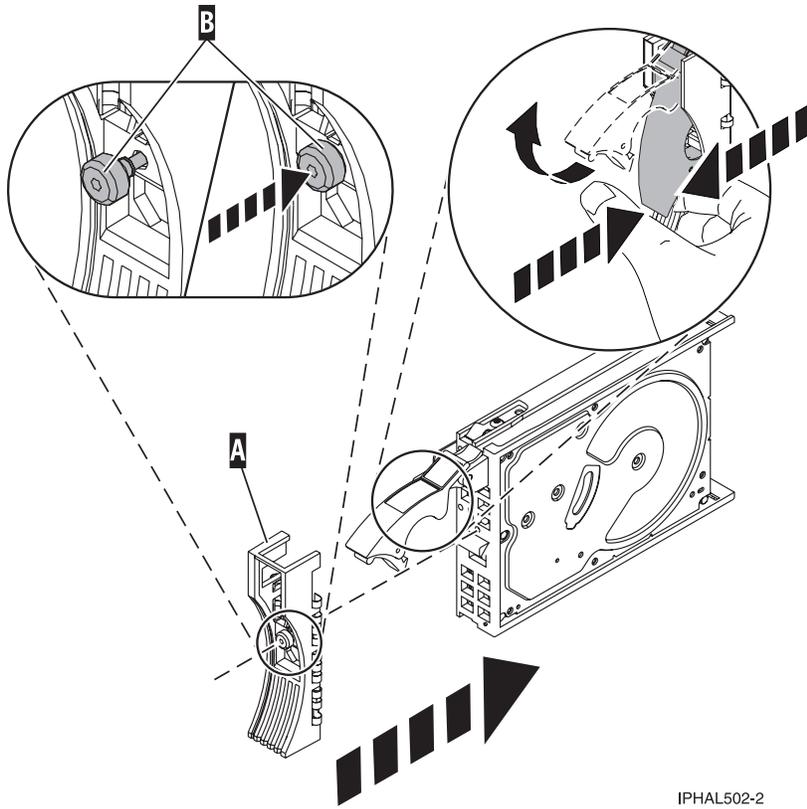


IPHAL505-0

Figure 90. Removing a disk-drive bezel

Replace the disk drive

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its protective package.
3. Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
4. If your replacement disk drive does not have a bezel preinstalled, then follow these steps to install the disk-drive bezel on the replacement disk drive:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.
 - b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



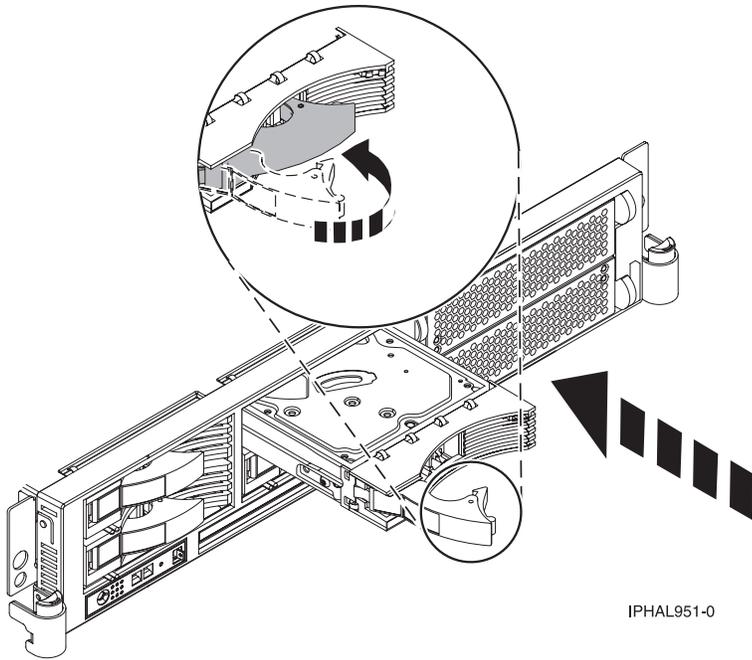
IPHAL502-2

Figure 91. Attaching a disk-drive bezel

5. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
6. Slide the disk drive into the system or expansion unit until it stops.

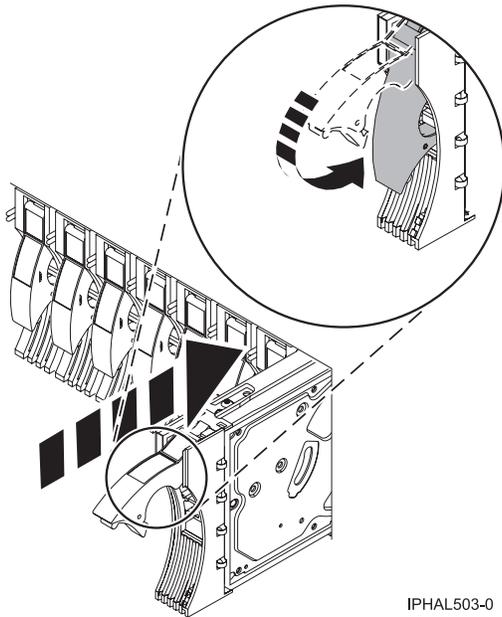
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

7. Push the disk drive handle in until it locks, as shown in Figure 92 on page 92 or Figure 93 on page 92.



IPHAL951-0

Figure 92. Installing a disk drive in a model 51x or 710



IPHAL503-0

Figure 93. Installing a disk drive in a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195

- “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
 3. Reconnect all system power cables.
 4. Reconnect the system to the power supply by plugging it in.
 5. Start the system or logical partition. For instructions, see “Start the system or logical partition” on page 167.
 6. If the system or logical partition that controls the disk drive you replaced is running AIX, verify that the disk drive is working as described in “Verify an installed feature or replaced part on an AIX system or logical partition” on page 219. If it is not possible to run online diagnostics, for example if you replaced the root volume group (rootvg) disk drive, use standalone diagnostics as described in “Verify an installed part using the eServer stand-alone diagnostics” on page 222.
 7. To rebuild the data on the replacement disk drive, select the operating system for the system or logical partition that controls the disk drive:
 - “Rebuild data on a replacement disk drive using AIX” on page 160
 - “Rebuild data on a replacement disk drive using i5/OS” on page 160
 - “Rebuild data on a replacement disk drive using Linux” on page 161

Replace a SCSI disk drive

You might need to replace a Small Computer System Interface (SCSI) disk drive in a system or expansion unit. Use the procedure in this section to perform this task.

Related information

General AIX diagnostic information

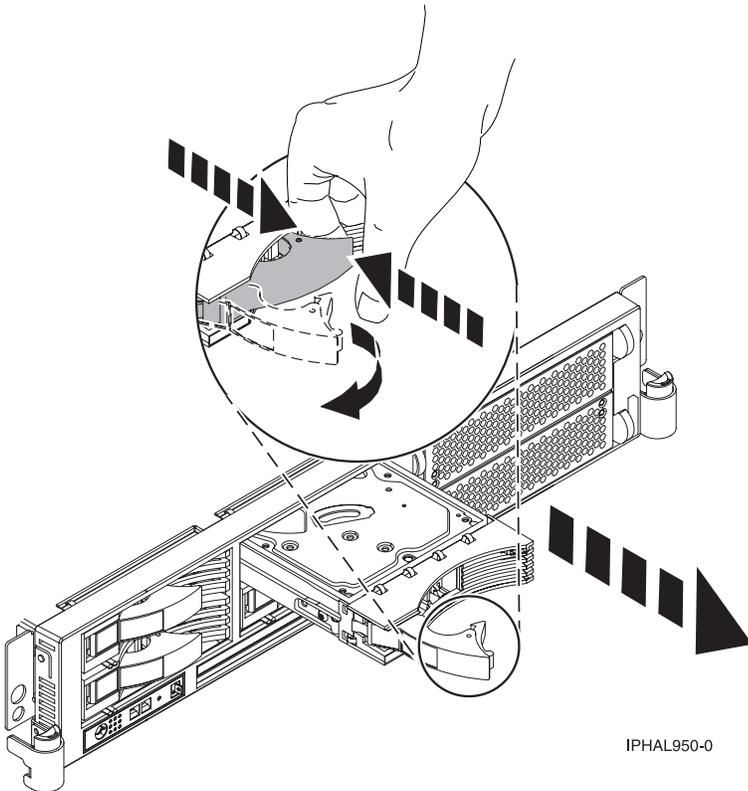
Remove the disk drive

1. Log in as root user or use CE Login.
For information on CE Login, go to General AIX diagnostic information.
2. At the command line, type `diag` and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. On the Task Selection display, select **Hot Plug Task**.
6. Select **SCSI and SCSI RAID Hot Plug Manager**.
7. Select **Identify a Device Attached to a SCSI Hot Swap Enclosure Device**.
8. Select the disk drive you want to replace and press Enter.

The disk drive slot enters the Identify state, indicated by the flashing concurrent maintenance light. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

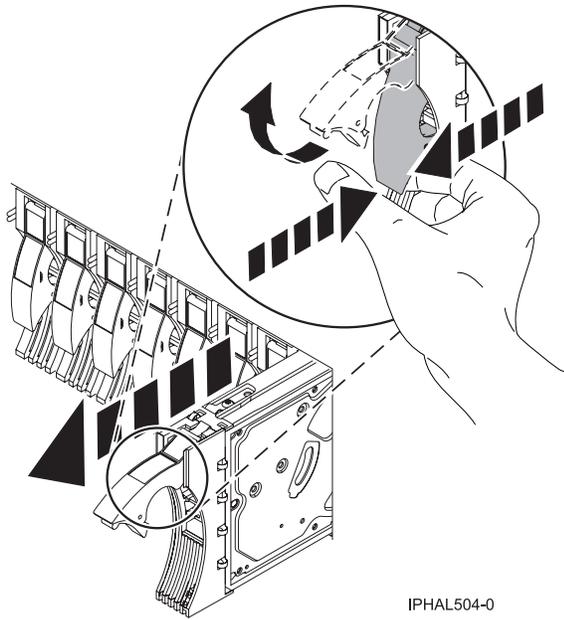
- “Disk-drive concurrent maintenance lights for model 505” on page 153
 - “Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720” on page 153
 - “Disk-drive concurrent maintenance lights for models 51x and 710” on page 153
 - “Disk-drive concurrent maintenance lights for models 9116-561 or 570” on page 154
 - “Disk-drive concurrent maintenance lights for model 575” on page 154
 - “Disk-drive concurrent maintenance lights for model 7311-D20” on page 154
 - “Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure” on page 155
9. Exit to the SCSI and SCSI RAID Hot Plug Manager display.

10. On the SCSI and SCSI RAID Hot Plug Manager display, select **Replace/Remove a Device Attached to a SCSI Hot Swap Enclosure Device**. A list of all slots from which you can remove a disk drive is shown.
11. Select the slot that contains the disk drive you want to remove. The disk drive slot enters the Remove state and power is removed from the slot. The concurrent maintenance light for the slot begins flashing rapidly.
12. Unlock the disk drive. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown in the following figures.



IPHAL950-0

Figure 94. Removing a disk drive from a model 51x or 710



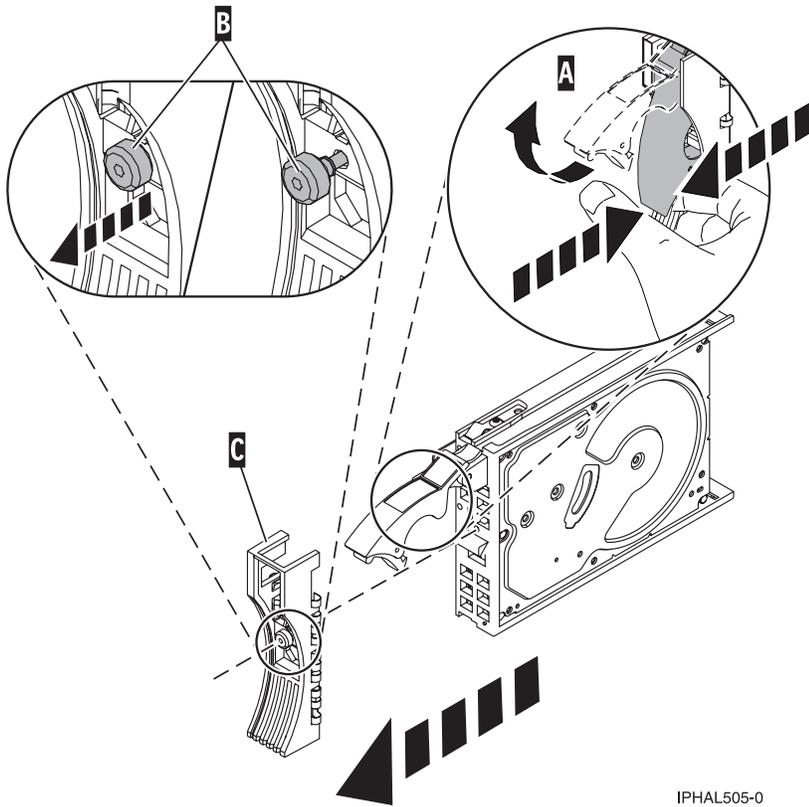
IPHAL504-0

Figure 95. Removing a disk drive from a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

13. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

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

14. Loosen and pull out on the thumbscrew **B** to release the bezel **C** from the disk drive.

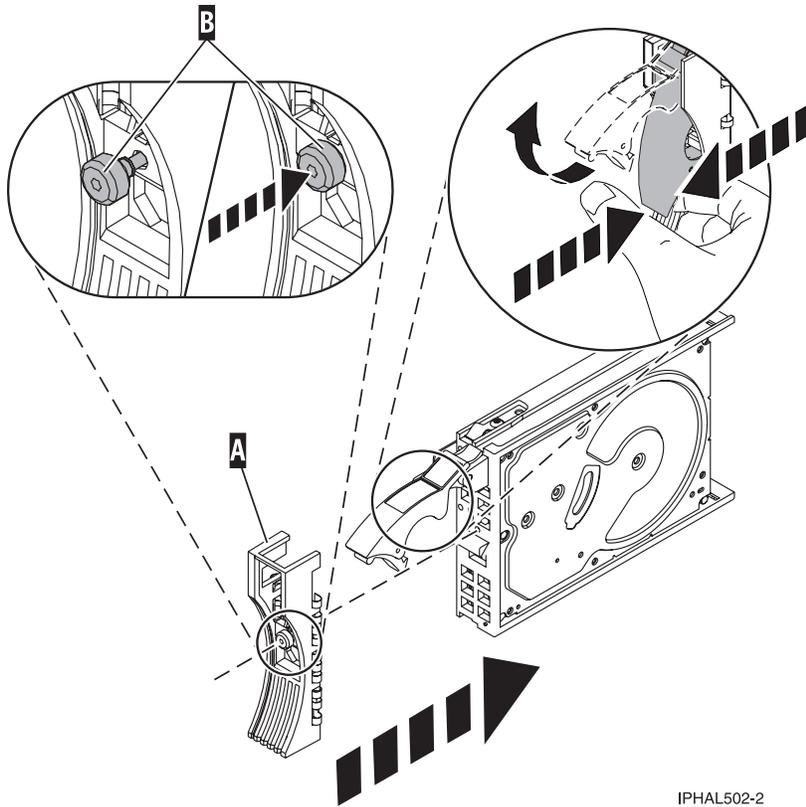


IPHAL505-0

Figure 96. Removing a disk-drive bezel

Replace the disk drive

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



IPHAL502-2

Figure 97. Attaching a disk-drive bezel

5. Press in and then tighten thumbscrew **B** to secure bezel **A** to the disk drive.
6. Install the disk drive as follows:
 - a. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 - b. Slide the disk drive into the system until it stops.

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

- c. Push the disk drive handle in until it locks, as shown in Figure 98 on page 98 or Figure 99 on page 98.

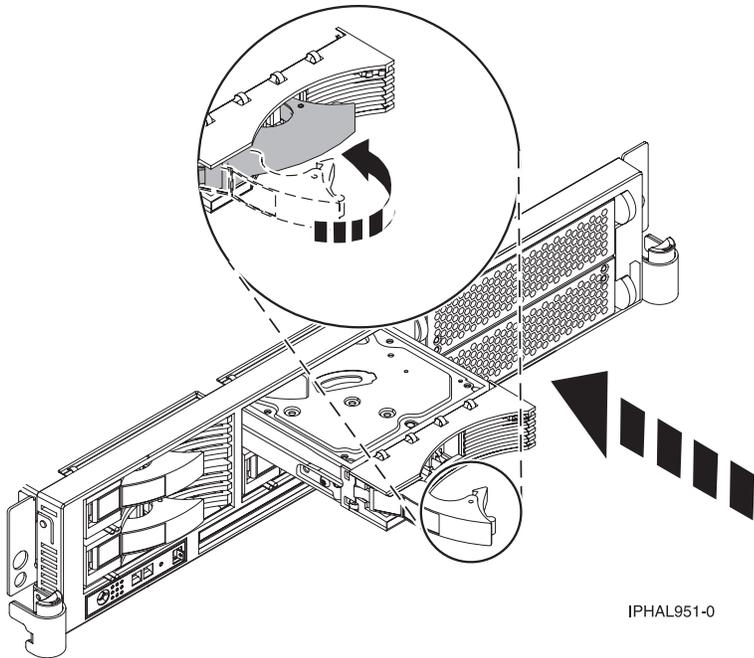


Figure 98. Installing a disk drive in a model 51x or 710

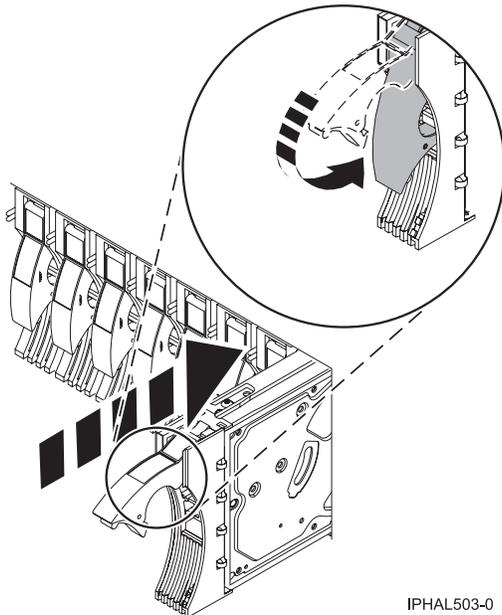


Figure 99. Installing a disk drive in a model a model 285, 52x, 55x, 9116-561, 570, 720, or 7311-D20

7. Press Enter.
8. Exit to the SCSI and SCSI RAID Hot-Plug Manager menu.
9. Select **Configure Added/Replaced Devices**. Press Enter.
10. Select the disk drive that you replaced and then press Enter.
The disk drive is now configured.
11. Exit to the Task Selection display.
12. Select **Log Repair Action**.

13. Select the disk drive that you replaced and then press Enter.
14. Select **Commit** after you have made your selection and then press Enter.
15. Exit to the command line.

Complete the procedure

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.
2. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
3. Verify that the disk drive is working. For instructions, see “Verify an installed feature or replaced part on an AIX system or logical partition” on page 219. If it is not possible to run online AIX diagnostics, for example if you replaced the root volume group (rootvg) disk drive, use standalone diagnostics as described in “Verify an installed part using the eServer stand-alone diagnostics” on page 222.
4. To prepare the disk drive for use, go to “Rebuild data on a replacement disk drive using AIX” on page 160.

Model 285 or 52x disk-drive backplane

You might need to install or replace a disk-drive backplane in the server. This section includes procedures so that you can perform these tasks.

Install a model 285 or 52x disk-drive backplane

You might need to install a disk-drive backplane in the server. Use the procedure in this section to perform this task.

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)

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a disk-drive backplane. For instructions, see “Install a feature using the Hardware Management Console” on page 211.

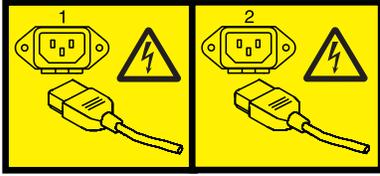
To install the disk-drive backplane, complete the following steps:

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.
3. Disconnect the power source from the system.

Note: This 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



4. Remove the system unit door or open the rack front door. For instructions on removing the stand-alone system unit door, see “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171.
5. Place the rack-mounted system unit in the service position. For instructions, see “Place the rack-mounted system or expansion unit in the service position” on page 197.
6. Remove the service access cover. For instructions, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 205.

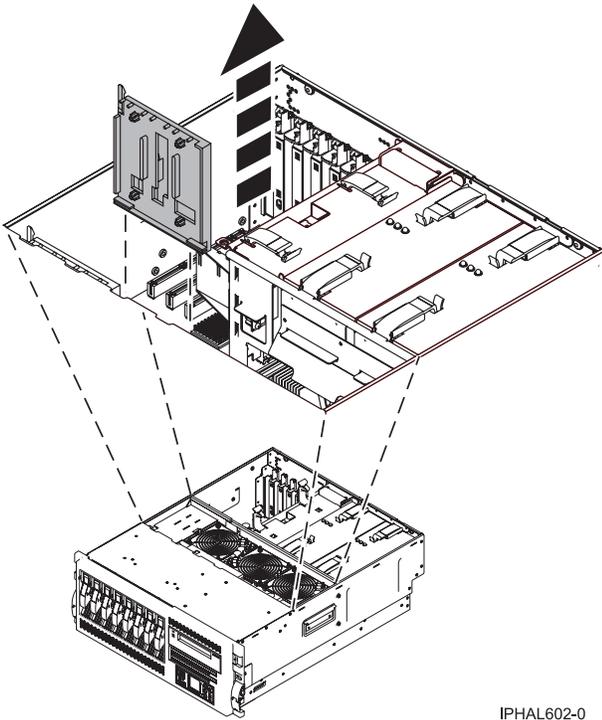
Install the disk-drive backplane

1. Remove the fan tray assembly. For instructions, see Remove the model 285 or 52x fan tray assembly. Skip any steps that you have already completed.

Attention:

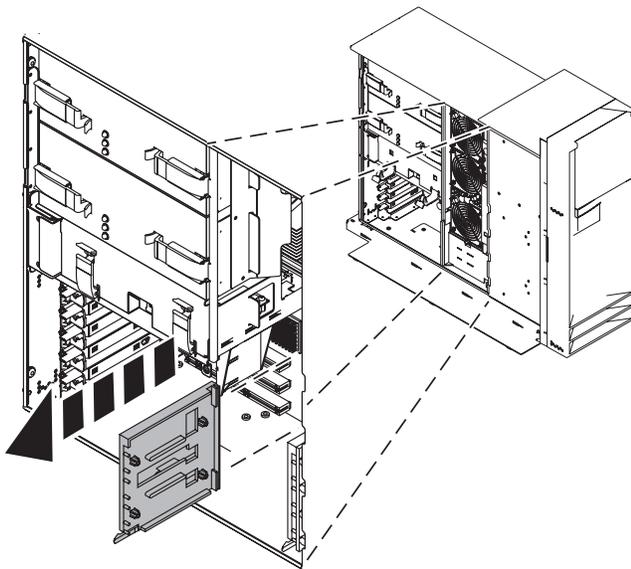
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Record the slot number and location of each PCI adapter.
 3. Remove and label the PCI adapter cables.
 4. Remove PCI adapters. For instructions, see Remove PCI adapters. Skip any steps that you have already completed.
 5. Remove the PCI adapter dividers. For instructions, see Remove PCI adapter dividers. Skip any steps that you have already completed.

6. If necessary, remove the disk-drive backplane filler from the slot in the system you want to use, as shown in Figure 100 or Figure 101.



IPHAL602-0

Figure 100. Removing a disk-drive backplane filler from rack-mounted system unit

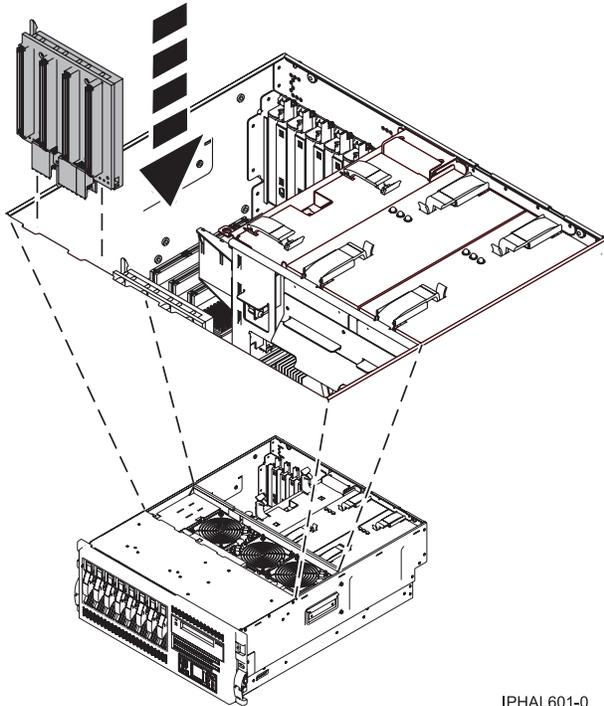


IPHAL612-0

Figure 101. Removing a disk-drive backplane filler from stand-alone system unit

7. Find the package that contains the new backplane and remove it from its protective package.
8. Carefully grasp the disk-drive backplane by the top edge.

9. Insert the disk-drive backplane into the system unit at an angle to the frame hooks and align the hooks with the blue guides on the disk-drive backplane.
10. Tip the disk-drive backplane forward onto the frame hooks, then firmly press the disk-drive backplane into the connector until you feel the latch tabs lock into place, as shown in Figure 102 or Figure 103 on page 104.



IPHAL601-0

Figure 102. Installing a disk-drive backplane in a rack-mounted system unit

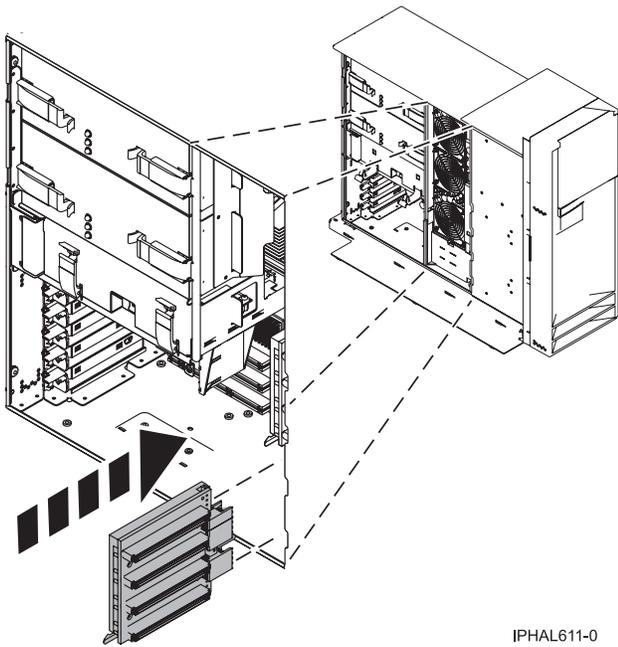


Figure 103. Installing a disk-drive backplane in a stand-alone system unit

11. Replace the PCI adapter dividers. For instructions, see Replace PCI adapter dividers. Skip any steps that you have already completed.
12. Replace the PCI adapters. For instructions, see Replace PCI adapters. Skip any steps that you have already completed.
13. If this backplane has a cable connection, install the cable to the backplane and attach the cable to Port 0 of the PCI disk adapter as shown in Figure 104. If you need to install the PCI adapter, see Install a PCI adapter.

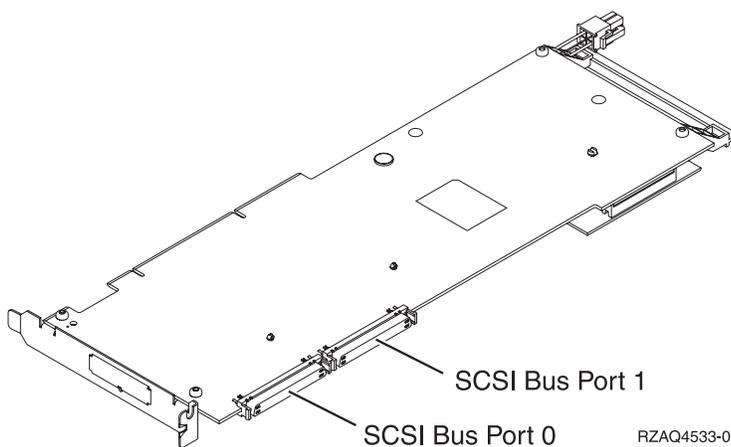


Figure 104. PCI adapter

14. Replace the fan tray assembly. For instructions, see Replace the model 285 or 52x fan tray assembly. Skip any steps that you have already completed.
15. If you are installing one or more disk drives, go to "Install a disk drive with the system or logical partition powered off" on page 44.

Complete the procedure

1. Install the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 208.
2. Return the rack-mounted system unit to the operating position. For instructions, see “Place the rack-mounted system or expansion unit in the operating position” on page 200.
3. Replace the system unit door or close the rack front door. For instructions about how to install the stand-alone system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
4. Start the system. For instructions, see “Start the system or logical partition” on page 167.
5. Verify that all of the disk drives connected to the new backplane are functional. For instructions, see “Verify the installed part” on page 219.

Replace a model 285 or 52x disk-drive backplane

You might need to replace a disk-drive backplane in the server. Use the procedure in this section to perform this task.

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)

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a disk-drive backplane. For instructions, see “Replace a part using the Hardware Management Console” on page 213.

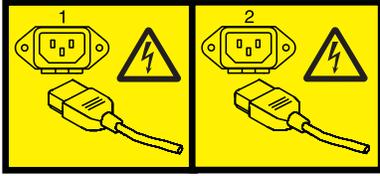
To replace the disk-drive backplane, complete the following steps:

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Identify the disk-drive backplane you need to replace. For instructions, see “Identify a failing part” on page 214.
3. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.
4. Disconnect the power source from the system.

Note: This 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



5. Remove the system unit door or open the rack front door. For instructions on removing the system unit door, see “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171.
6. Place the rack-mounted system unit in the service position. For instructions, see to “Place the rack-mounted system or expansion unit in the service position” on page 197.
7. Remove the service access cover. For instructions, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 205.

Remove the disk-drive backplane

1. Remove the fan tray assembly. For instructions, see Remove the Model 520 fan tray assembly. Skip any steps that you have already completed.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. If you are removing the disk-drive backplane behind disk drive slots P3-D1 through P3-D4 as shown on the label on the access cover, go to the next step. If you are removing the disk-drive backplane behind disk drive slots P2-D1 through P2-D4, do the following procedure:
 - a. Record the slot number and location of each PCI adapter.
 - b. Remove and label the PCI adapter cables.
 - c. Remove PCI adapters. For instructions, see Remove PCI adapters. Skip any steps that you have already completed.

- d. Remove the PCI adapter dividers. For instructions, see PCI adapter dividers. Skip any steps that you have already completed.
3. Disconnect each disk drive by squeezing and pulling the handle of the disk drive out toward you. If the handle is not all the way out, the disk drive will not slide out of the system or expansion unit. Pull the disk drive forward, but not out of the system unit, as shown in the following figure.

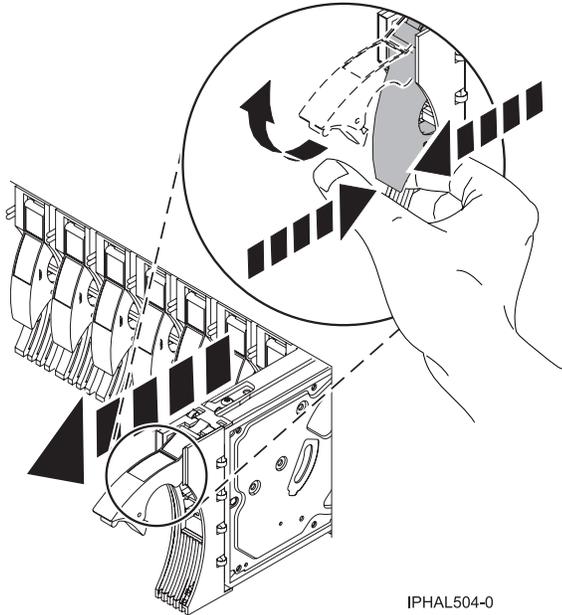


Figure 105. Disconnecting a disk drive from the disk-drive backplane

4. Pull any disk-drive fillers forward, but not out of the system, as shown in the following figure.

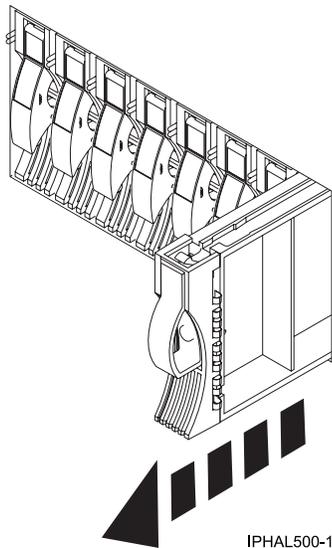


Figure 106. Disconnecting a disk-drive filler

5. Squeeze the latch tabs on the top edge of the disk-drive backplane and pull it upward to free it from the connector. Tip the disk-drive backplane away from the frame hooks on the wall of the frame, and

lift it out of the system unit, as shown in Figure 107 or Figure 108.

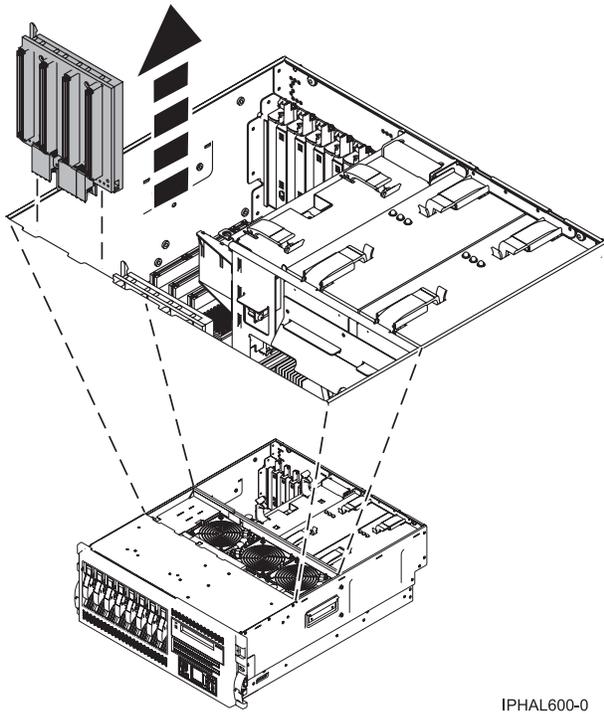


Figure 107. Removing a disk-drive backplane from rack-mounted system unit

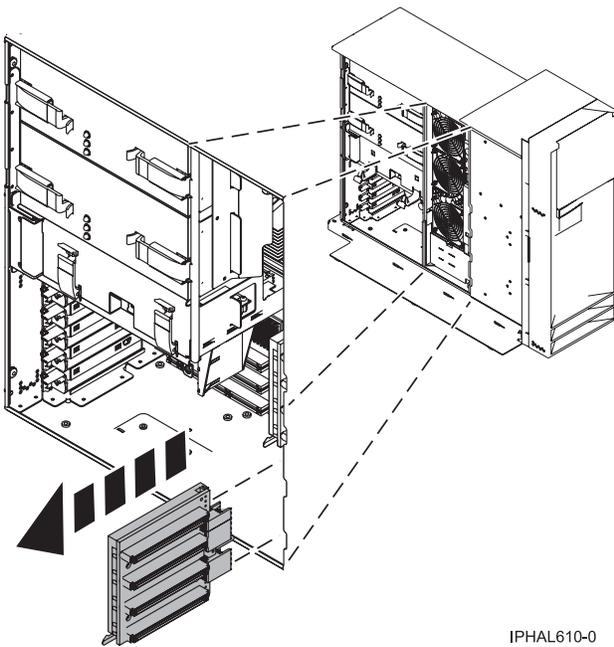
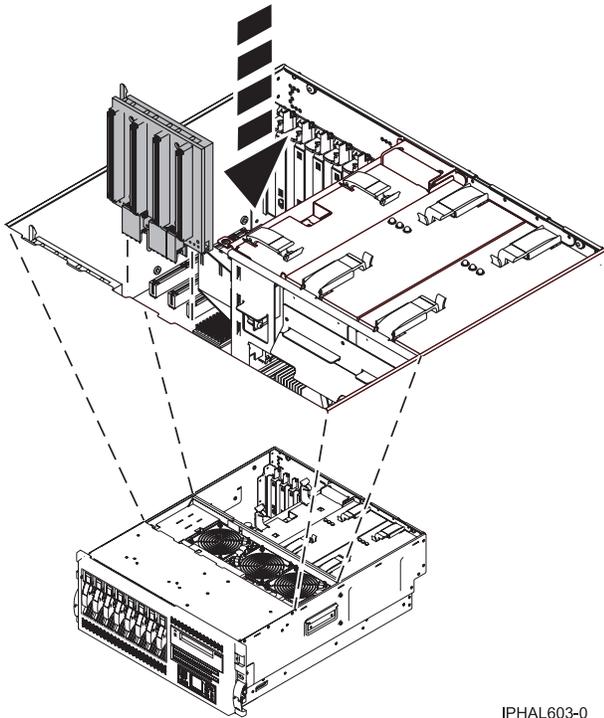


Figure 108. Removing a disk-drive backplane from stand-alone system unit

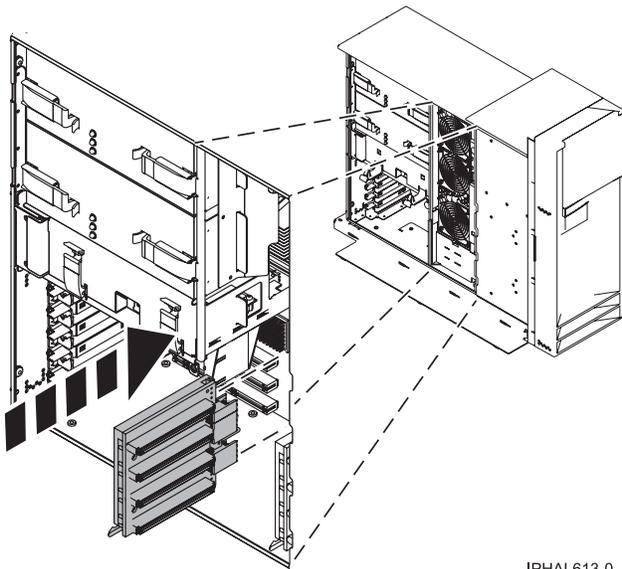
Replace the disk-drive backplane

1. Find the package that contains the new backplane and remove it from its protective package.
2. Carefully grasp the disk-drive backplane by the top edge.
3. Insert the disk-drive backplane into the system unit at an angle to the frame hooks and align the hooks with the blue guides on the disk-drive backplane.
4. Tip the disk-drive backplane forward onto the frame hooks, then firmly press the disk-drive backplane into the connector until you feel the latch tabs lock into place, as shown in Figure 109 or Figure 110 on page 111.



IPHAL603-0

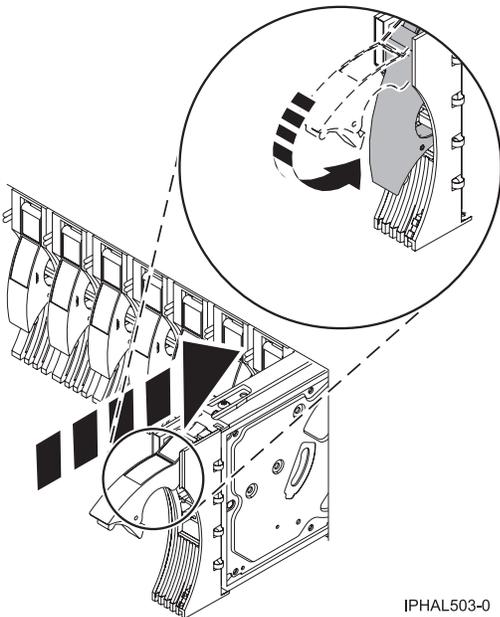
Figure 109. Replacing a disk-drive backplane in a rack-mounted system unit



IPHAL613-0

Figure 110. Replacing a disk-drive backplane in a stand-alone system unit

5. Press the disk drive back into place, closing their handles. Press any disk-drive fillers back into place, as shown in the following figure.



IPHAL503-0

Figure 111. Installing a disk drive

6. If you are replacing or installing the disk-drive backplane behind disk drive slots 5, 6, 7, and 8, complete the following steps:
 - a. Replace the PCI adapter dividers. For instructions, see PCI adapter dividers.
 - b. Replace the PCI adapters. For instructions, see Replace PCI adapters.
 - c. Reconnect all adapter cables, located at the back of the system unit.
 If you are replacing the disk-drive backplane behind disk drive slots 1, 2, 3, and 4, go to the next step.

Complete the procedure

1. Replace the fan tray assembly. For instructions, see [Replace the fan tray assembly](#).
2. Reconnect the power source to the system.
3. Install the service access cover. For instructions, see [“Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720”](#) on page 208.
4. Return the rack-mounted system unit to its operating position. For instructions, see [“Place the rack-mounted system or expansion unit in the operating position”](#) on page 200.
5. Replace the system unit door or close the rack front door. For instructions on installing the system unit door, see [“Install or replace the door on the model 285, 52x, 55x, or OpenPower 720”](#) on page 173.
6. Start the system. For instructions, see [“Start the system or logical partition”](#) on page 167.
7. Verify that all of the disk drives connected to the new backplane are functional. For instructions, see [“Verify the installed part”](#) on page 219.

Model 55x or 720 disk-drive backplane

You might need to install or replace a disk-drive backplane in the server. This section includes procedures so that you can perform these tasks.

Install a model 55x or 720 disk-drive backplane

You might need to install a disk-drive backplane in the server. Use the procedure in this section to perform this task.

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)

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a disk-drive backplane. For instructions, see “Install a feature using the Hardware Management Console” on page 211.

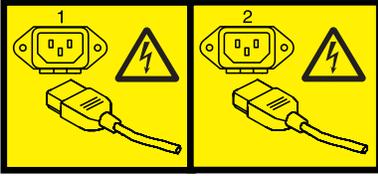
To install the disk-drive backplane, complete the following steps:

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.
3. Disconnect the power source from the system.

Note: This 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



4. Remove the system unit door or open the rack front door. For instructions on removing the system unit door, see “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171.
5. Place the rack-mounted system unit in the service position. For instructions, see “Place the rack-mounted system or expansion unit in the service position” on page 197.
6. Remove the service access cover. For instructions, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 205.

Install the disk-drive backplane

1. If necessary, remove the disk-drive backplane filler from the slot in the system you want to use, as shown in Figure 112 on page 115 or Figure 113 on page 115.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

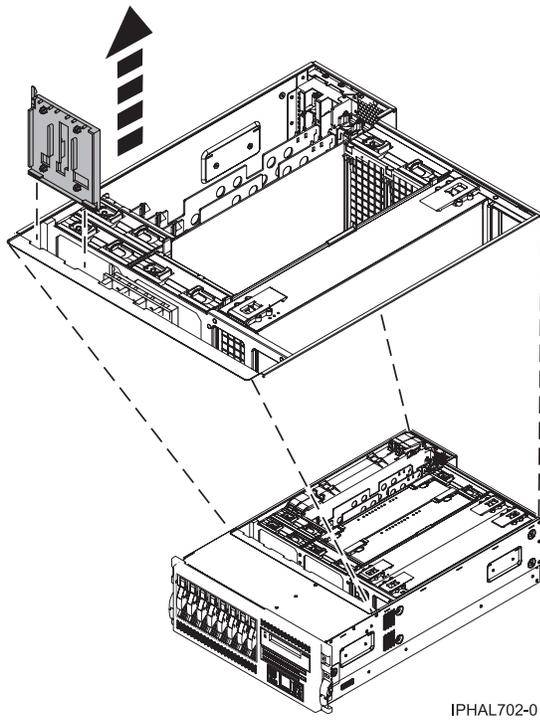


Figure 112. Removing a disk-drive backplane filler from a rack-mounted system unit

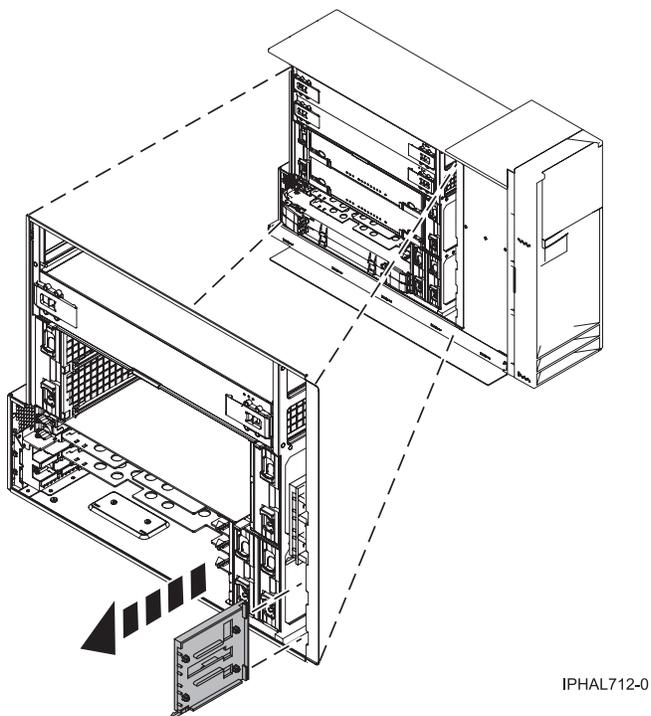


Figure 113. Removing a disk-drive backplane filler from a stand-alone system unit

2. Find the package that contains the new backplane and remove it from its protective package.
3. Carefully grasp the disk-drive backplane by the top edge.

4. Insert the disk-drive backplane into the system unit at an angle to the frame hooks, and align the hooks with the blue guides on the disk-drive backplane.
5. Tip the disk-drive backplane forward onto the frame hooks, then firmly press the disk-drive backplane into the connector until you feel the latch tabs lock into place, as shown in Figure 114 or Figure 115 on page 117.

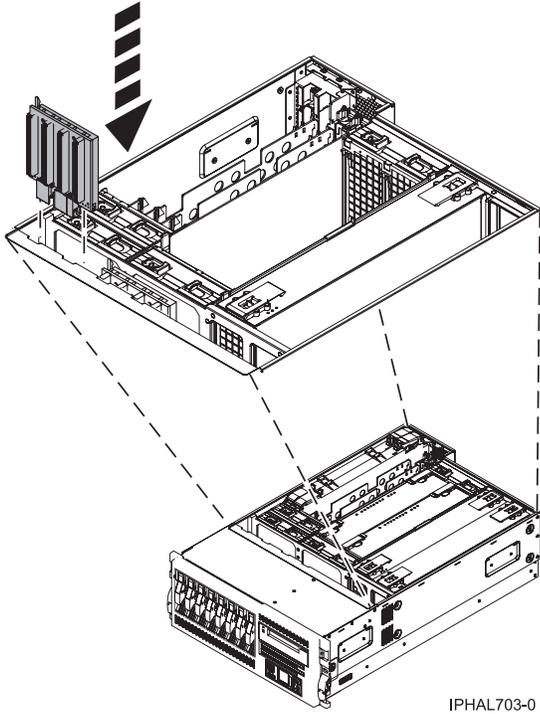
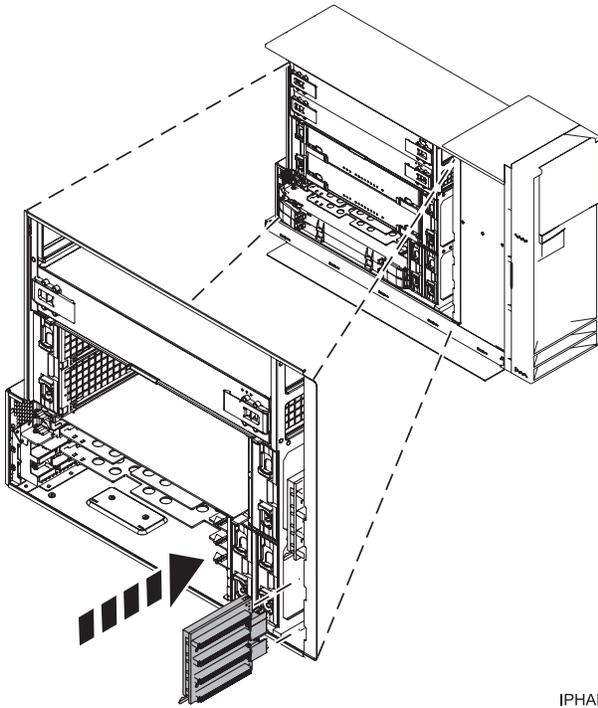


Figure 114. Installing a disk-drive backplane in a rack-mounted system unit



IPHAL713-0

Figure 115. Installing a disk-drive backplane in a stand-alone system unit

6. If this backplane has a cable connection, install the cable to the backplane and attach the cable to Port 0 of the PCI disk adapter, as shown in the following figure. If you need to install the PCI adapter, see [Install a PCI adapter](#).

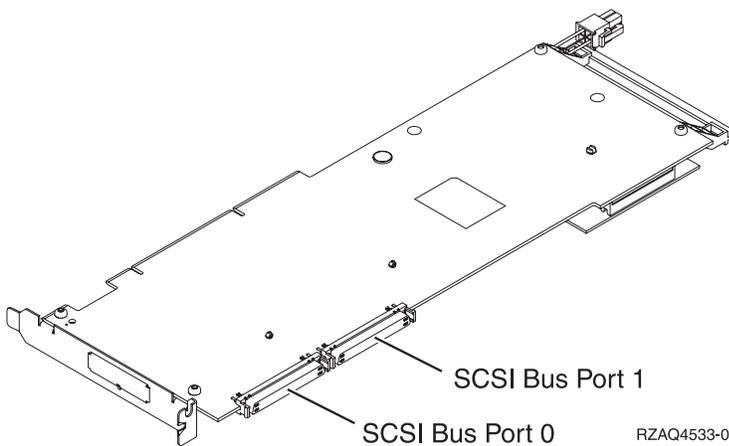


Figure 116. PCI adapter

7. If you are installing one or more disk drives, go to “Install a disk drive with the system or logical partition powered off” on page 44.

Complete the procedure

1. Install the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 208.
2. Return the rack-mounted system unit to the operating position. For instructions, see “Place the rack-mounted system or expansion unit in the operating position” on page 200.

3. Replace the system unit door or close the front door of the rack. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
4. Start the system. For instructions, see “Start the system or logical partition” on page 167.
5. Verify that all of the disk drives connected to the new backplane are functional. For instructions, see “Verify the installed part” on page 219.

Replace a model 55x or 720 disk-drive backplane

You might need to replace a disk-drive backplane in the server. Use the procedure in this section to perform this task.

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)

If your model 55x or OpenPower® 720 system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a disk-drive backplane. For instructions, see “Replace a part using the Hardware Management Console” on page 213.

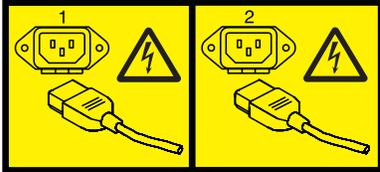
To replace the disk-drive backplane, complete the following steps:

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Identify the disk-drive backplane you need to replace. For instructions, see “Identify a failing part” on page 214.
3. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.
4. Disconnect the power source from the system.

Note: This 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



5. Remove the system unit door or open the rack front door. For instructions on removing the stand-alone system unit door, see “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171.
6. Place the rack-mounted system unit in the service position. For instructions, see to “Place the rack-mounted system or expansion unit in the service position” on page 197.
7. Remove the service access cover. For instructions, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 205.

Remove the disk-drive backplane

1. Disconnect each disk drive by squeezing and pulling the handle of the disk drive out toward you. If the handle is not all the way out, the disk drive can not slide out of the system or expansion unit. Pull the disk drives forward, but not out of the system unit, as shown in the following figure.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

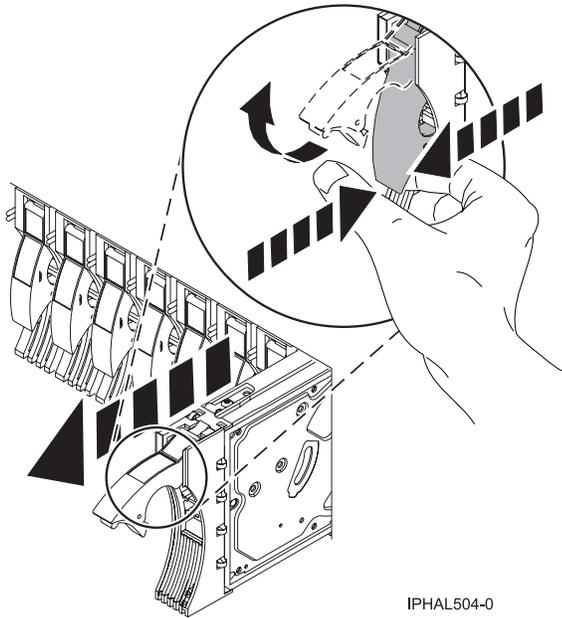


Figure 117. Disconnecting a disk drive from the disk-drive backplane

2. Pull any disk-drive fillers forward, but not out of the system, as shown in the following figure.

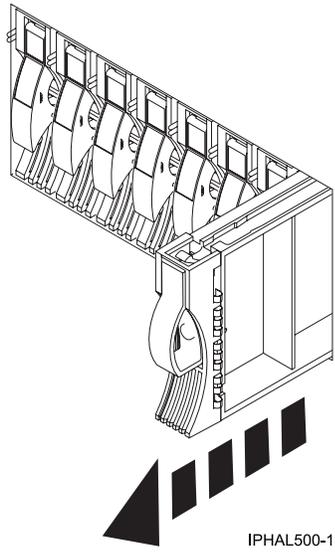


Figure 118. Disconnecting a disk-drive filler

3. Squeeze the latch tabs on the top edge of the disk-drive backplane and pull it upward to release it from the connector. Tip the disk-drive backplane away from the frame hooks on the wall of the frame, and lift it out of the system unit, as shown in Figure 119 or Figure 120 on page 122.

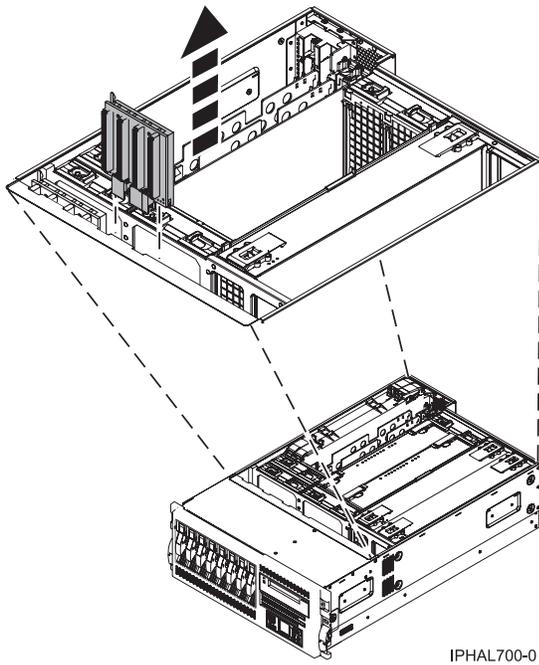
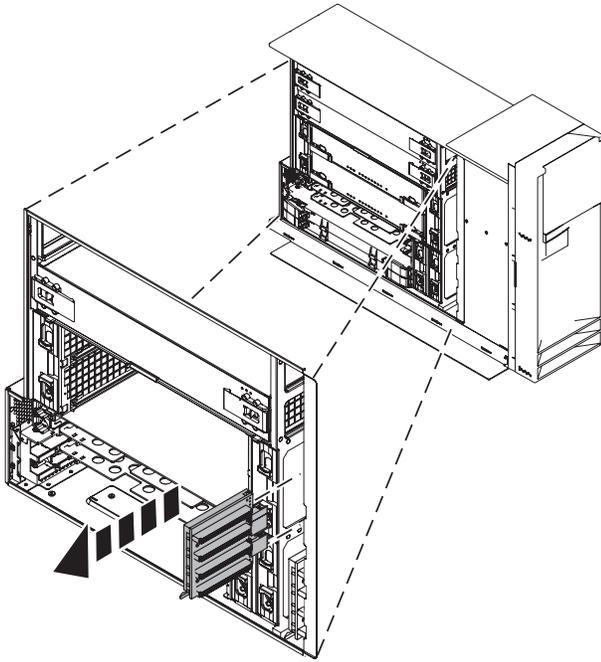


Figure 119. Removing a disk-drive backplane from a rack-mounted system unit



IPHAL710-0

Figure 120. Removing a disk-drive backplane from a stand-alone system unit

Replace the disk-drive backplane

1. Find the package that contains the new backplane and remove it from its protective package.
2. Carefully grasp the disk-drive backplane by the top edge.
3. Insert the disk-drive backplane into the system unit at an angle to the frame hooks, and align the hooks with the blue guides on the disk-drive backplane.
4. Tip the disk-drive backplane forward onto the frame hooks, then firmly press the disk-drive backplane into the connector until you feel the latch tabs lock into place, as shown in Figure 121 on page 123 or Figure 122 on page 123.

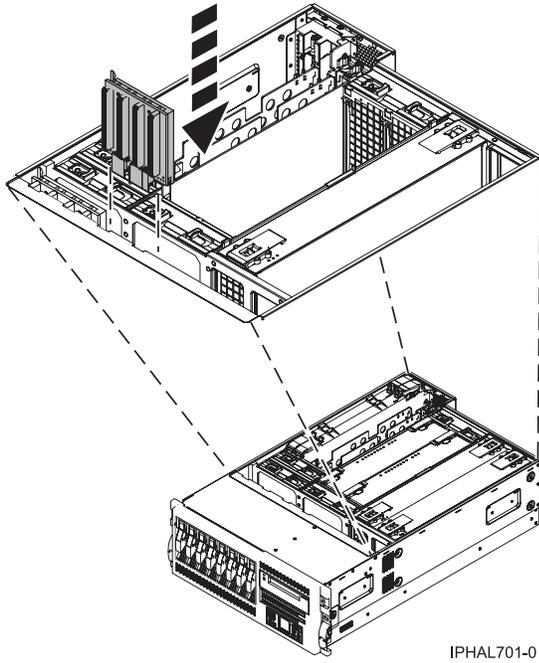


Figure 121. Replacing a disk-drive backplane in a rack-mounted system unit

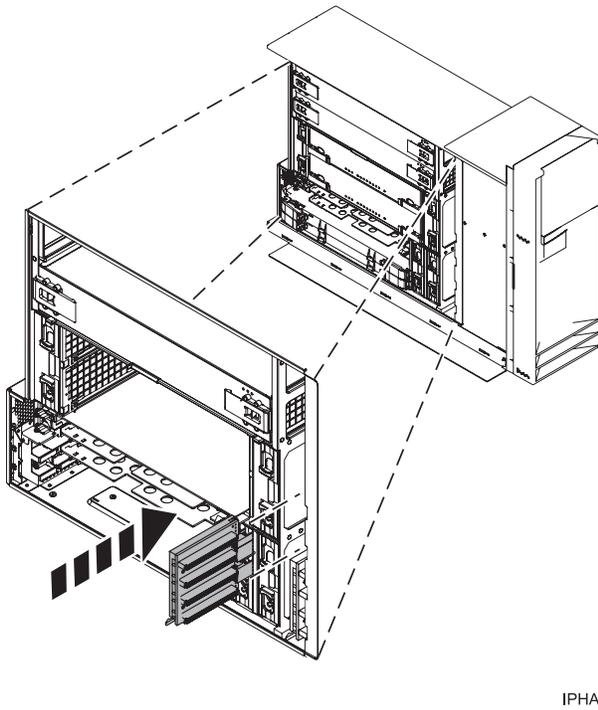
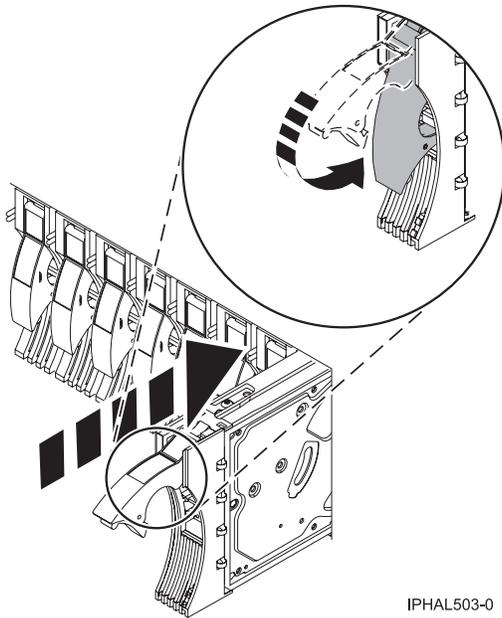


Figure 122. Replacing a disk-drive backplane in a stand-alone system unit

5. Press the disk drives back into place, closing their handles as shown in the following figure.



IPHAL503-0

Figure 123. Installing a disk drive

6. If necessary, press any disk-drive fillers back into place.

Complete the procedure

1. Reconnect the power source to the system.
2. Install the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 208.
3. Return the rack-mounted system unit to its operating position. For instructions, see “Place the rack-mounted system or expansion unit in the operating position” on page 200.
4. Replace the system unit door or close the rack front door. For instructions on installing the stand-alone system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.
5. Start the system. For instructions, see “Start the system or logical partition” on page 167.
6. Verify that all of the disk drives connected to the new backplane are functional. For instructions, see “Verify the installed part” on page 219.
7. If you are a service provider performing this task, return to the procedure that sent you here.

Replace the model 9116-561 or 570 disk-drive enclosure and SCSI-IDE converter card

You might need to replace your disk-drive enclosure or SCSI-IDE converter card from the server. This section includes procedures so that you can perform these tasks.

Replace the model 9116-561 or 570 disk-drive enclosure

You might need to replace a disk-drive enclosure in the server. Use the procedure in this section to perform this task.

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)

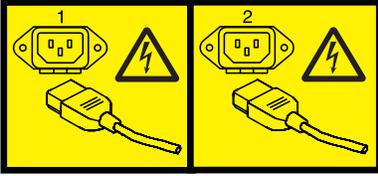
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a disk-drive enclosure. For instructions, see “Replace a part using the Hardware Management Console” on page 213.

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 165.
2. Stop the system. For instructions, see “Stop the system or logical partition” on page 169.
3. Disconnect the power source from the system.

Note: This 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



4. Open the rack front door.
5. Remove the system unit front cover. For instructions, see “Remove the front cover from the model 9116-561 or 570” on page 192.

Access the disk-drive enclosure

1. Remove the control panel as described in Remove the control panel with power off. Skip any steps that you have already completed.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Remove the media device enclosure as described in Remove the media-device enclosure with the system power off. Skip any steps that you have already completed.
 3. Remove the system unit fans. For instructions, see Remove the system unit fan with the system power off. Skip any steps that you have already completed.

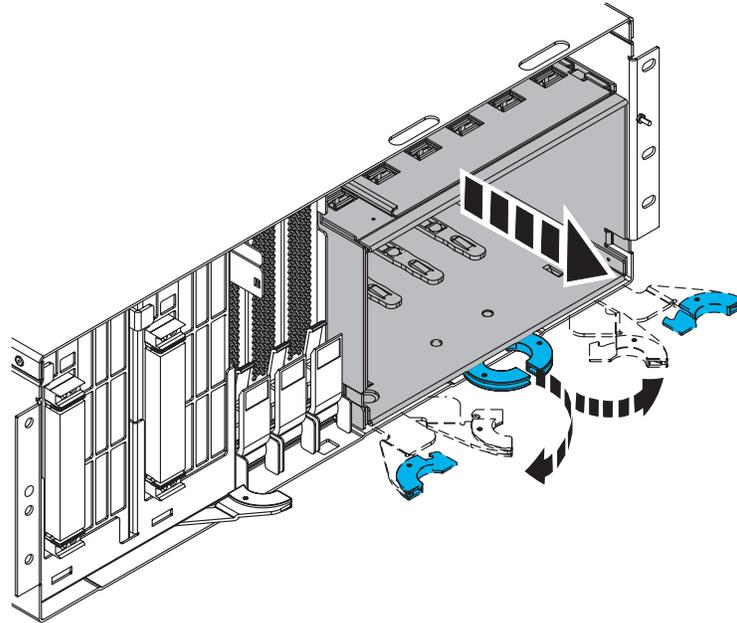
Remove the disk drives and disk-drive fillers

1. Carefully label all disk drives and disk-drive fillers so you can later return them to their original locations.
2. Unlock the disk drive handle by squeezing it and pulling it out toward you.

3. Support the bottom of the disk drive as you slide it out of the system. Do not hold the disk drive by the handle.
4. Place the disk drives in a location protected from electrostatic discharge.
5. Pull any disk-drive fillers forward and out of the system.

Remove the disk-drive enclosure and replace the SCSI-IDE card

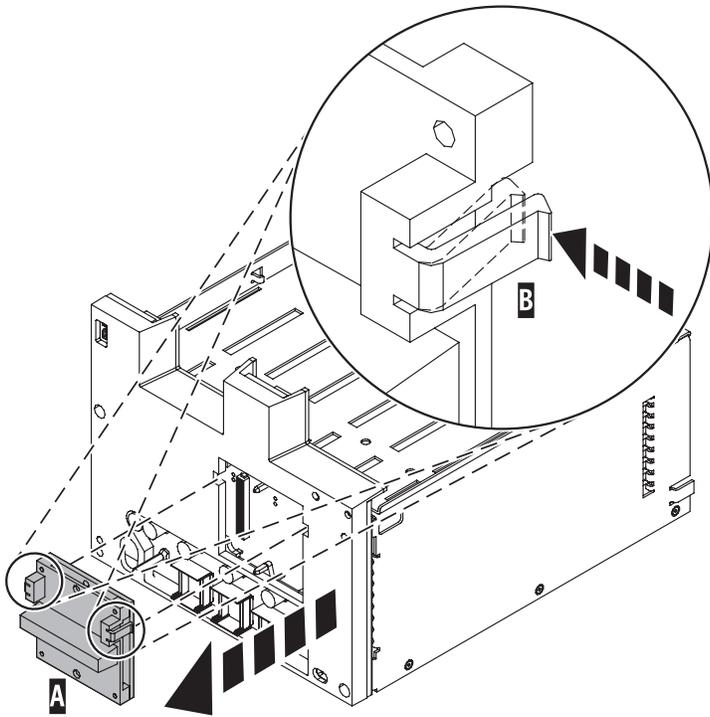
1. Press down and pull out to open the handles on the lower edge of the disk-drive enclosure, as shown in the following figure.
2. Pull the enclosure toward you to remove it from the system unit.



IPHAU512-0

Figure 124. Removing a disk-drive enclosure

3. If there is a SCSI-IDE converter card on the disk-drive enclosure, squeeze the tabs and remove the card from the enclosure, as shown in the following figure.

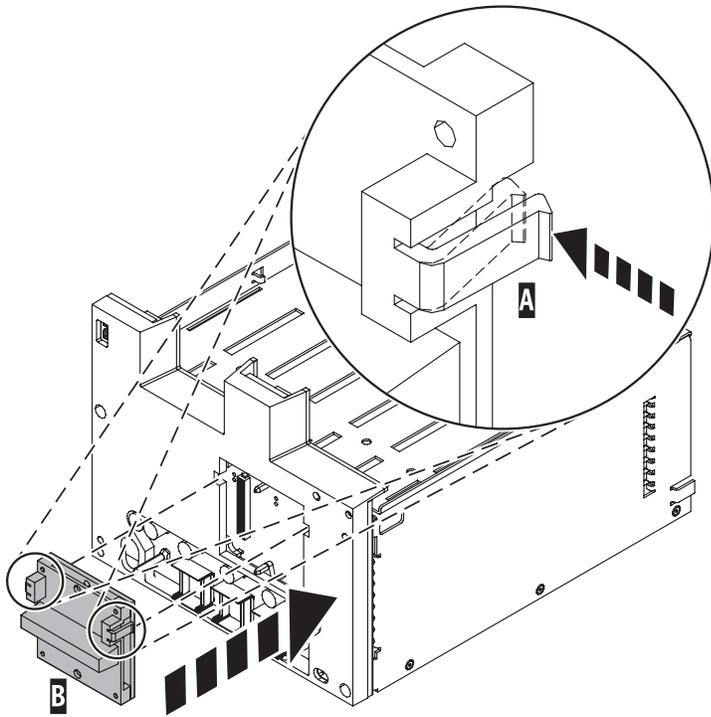


IPHBB500-0

Figure 125. Remove a SCSI-IDE converter card

Replace the SCSI-IDE converter and the disk-drive enclosure

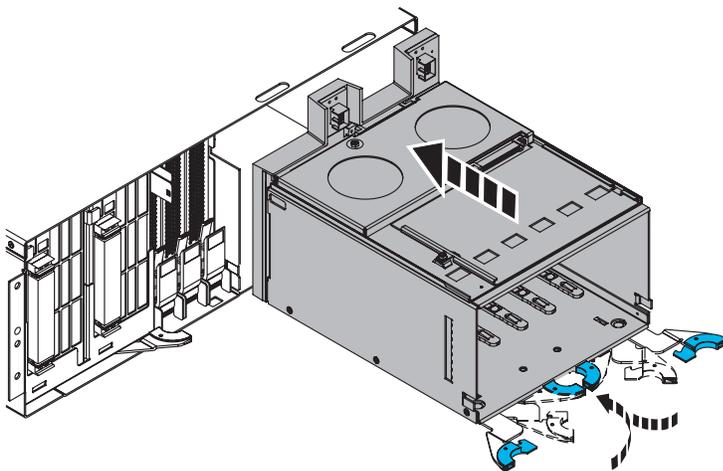
1. Find the package that contains the new disk-drive enclosure and remove it from its protective package.
2. If you removed a SCSI-IDE converter card from the disk-drive enclosure that you removed from the system, install the SCSI-IDE converter card on to the new disk-drive enclosure, as shown in the following figure.



IPHBB501-0

Figure 126. Installing a SCSI-IDE converter card

3. Insert the disk-drive enclosure into the system unit.
4. Slide the disk-drive enclosure into the system until it locks into place, as shown in the following figure.
5. Close the handles.



IPHAU513-0

Figure 127. Replacing a disk-drive enclosure

Install the disk drive and disk-drive fillers

Follow these steps to return the disk drives and disk-drive fillers to their original locations:

1. Unlock the handle of each disk drive by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive cannot slide into the system unit.

2. Align the disk drive with the guide rails in the system unit.
3. Slide the disk drive into the system until it stops, as shown in the following figure.
4. Push the disk-drive handle in until it locks.

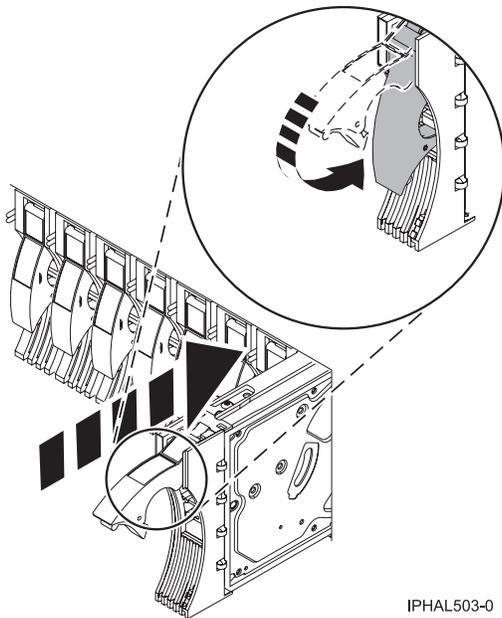


Figure 128. Installing a disk drive

5. Repeat these steps to install all of the disk drives.
6. Return any disk-drive fillers to their original locations.

Complete the procedure

1. Replace the fans. For instructions, see Replace the system unit fan with the system power off. Skip any steps that you have already completed.
2. Replace the media device enclosure. For instructions, see Replace the media device enclosure with the system power off. Skip any steps that you have already completed.
3. Replace the control panel. For instructions, see Replace the control panel with power off. Skip any steps that you have already completed.
4. Replace the system unit front cover. For instructions, see “Install the front cover on the model 9116-561 or 570” on page 193.
5. Close the rack front door.
6. Reconnect the power source to the system.
7. Start the system. For instructions, see “Start the system or logical partition” on page 167.
8. If you are a service provider performing this task, return to the procedure that sent you here.

Replace the model 9116-561 or 570 SCSI-IDE converter card

You might need to replace a SCSI-IDE converter card in the server. Use the procedure in this section to perform this task.

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)

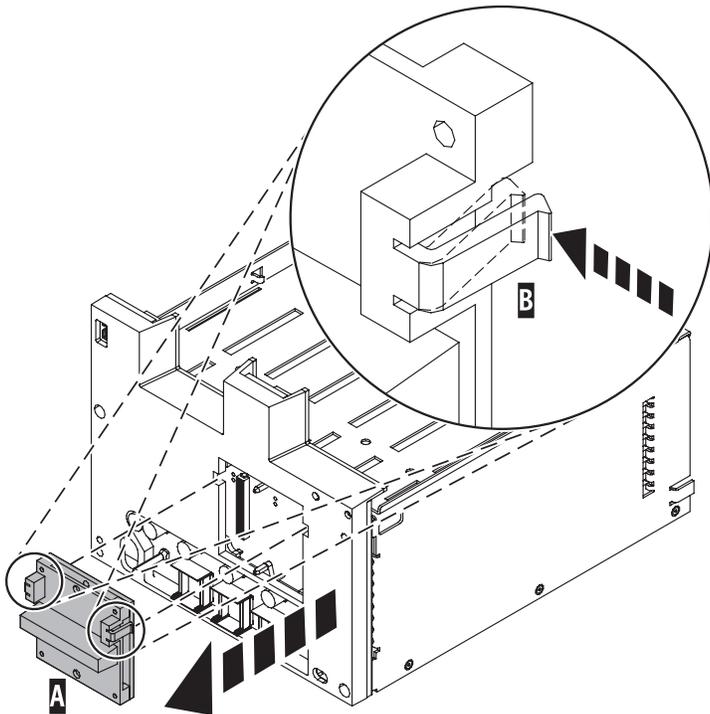
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a SCSI-IDE converter card. For instructions, see “Replace a part using the Hardware Management Console” on page 213.

To replace the small-computer-system-interface (SCSI) - integrated drive electronics (IDE) converter card, perform these steps:

1. Follow the instructions in “Replace the model 9116-561 or 570 disk-drive enclosure” on page 124 to remove the disk-drive enclosure, then return to this procedure. Skip any steps that you have already completed.

Attention:

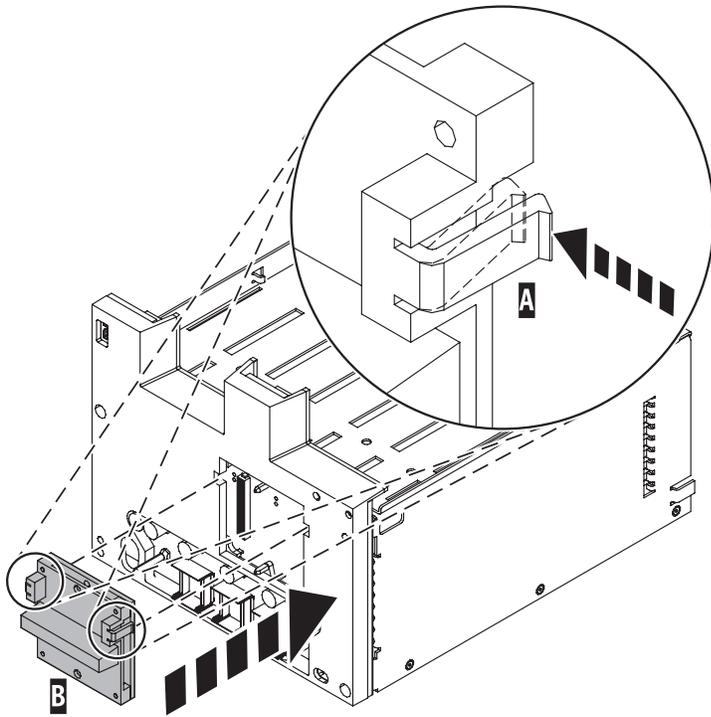
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Squeeze the tabs and pull the SCSI-IDE converter card away from the disk-drive enclosure, as shown in the following figure.



IPHBB500-0

Figure 129. Removing a SCSI-IDE converter card

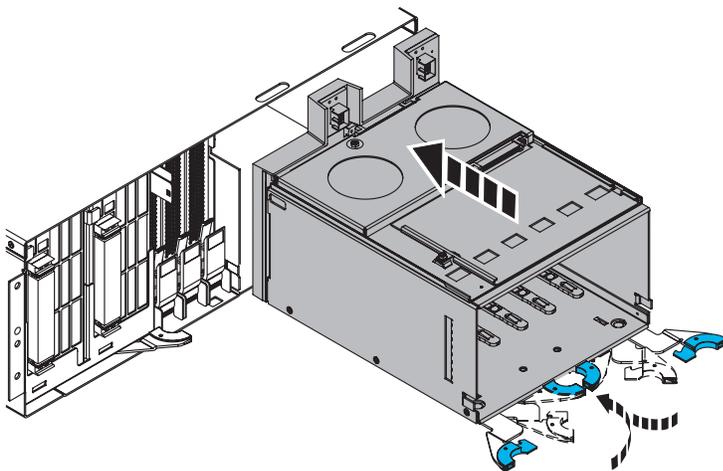
3. Push the SCSI-IDE converter card on to the disk-drive enclosure, as shown in the following figure.



IPHBB501-0

Figure 130. Replacing a SCSI-IDE converter card

4. Replace the disk-drive enclosure as follows:
 - a. Insert the disk-drive enclosure into the system unit.
 - b. Slide the disk-drive enclosure into the system until it locks into place, as shown in the following figure.

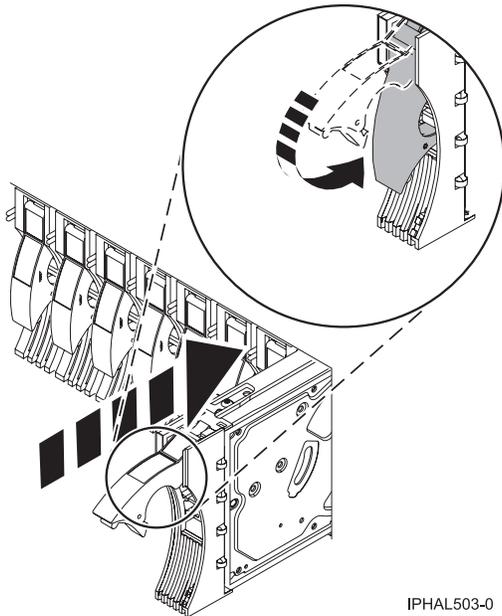


IPHAU513-0

Figure 131. Installing a disk-drive enclosure

- c. Close the handles.
5. Replace all disk drives and disk-drive fillers in their original locations as follows:
 - a. Unlock the handle of each disk drive by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive cannot slide into the system unit.

- b. Align the disk drive with the guide rails in the system unit.
- c. Slide the disk drive into the system until it stops, as shown in the following figure.



IPHAL503-0

Figure 132. Installing a disk drive

- d. Push the disk drive handle in until it locks.
 - e. Repeat these steps to install all of the disk drives.
 - f. Return any disk-drive fillers to their original locations.
6. Replace the fans. For instructions, see *Replace the fans*. Skip any steps that you have already completed.
 7. Replace the media device enclosure. For instructions, see *Replace the media device enclosure*. Skip any steps that you have already completed.
 8. Replace the control panel. For instructions, see *Replace the control panel*. Skip any steps that you have already completed.
 9. Replace the system unit front cover. For instructions, see “Install the front cover on the model 9116-561 or 570” on page 193.
 10. Start the system. For instructions, see “Start the system or logical partition” on page 167.

Remove or install a disk-drive filler

You might need to remove or install a Small Computer System Interface (SCSI) disk-drive filler in the server or expansion unit. This section includes procedures so that you can perform these tasks.

Note: Refill the disk drive slots with either another disk drive or a disk-drive filler. Filling the disk drive slot will help ensure proper air flow for cooling and help maintain optimal EMI compliance.

Remove a disk-drive filler

You might need to remove a Small Computer System Interface (SCSI) disk-drive filler from the server or expansion unit. Use the procedure in this section to perform this task.

Note: Some of the figures in this procedure might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

1. Remove the system unit door, expansion unit door, or open the rack front door. For instructions, select the appropriate procedure from the following list:
 - “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171
 - “Expansion unit cover or door” on page 175
2. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188
 - “Remove the front cover from the model 9116-561 or 570” on page 192
 - “Remove the front cover from the model 51x or 710” on page 194
 - “Remove the front cover from the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.
3. Identify the disk-drive filler you want to remove.
4. Pull the disk-drive filler from the slot. Pull the disk-drive filler from the slot that you want to use, as shown in Figure 133 or Figure 134 on page 136.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

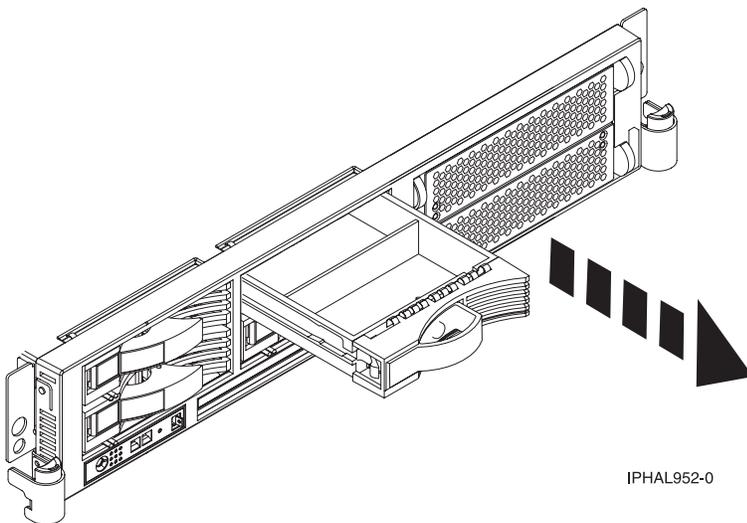


Figure 133. Removing a disk-drive filler from a model 51x or 710

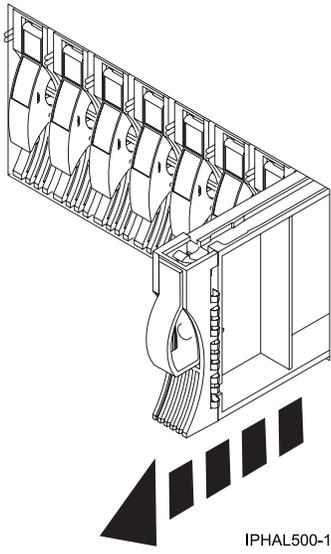


Figure 134. Removing a disk-drive filler from a model 52x, 55x, 9116-561 or 570

5. Gently pull off the disk-drive bezel latch **A** from the front of the filler, as shown in the following figure.

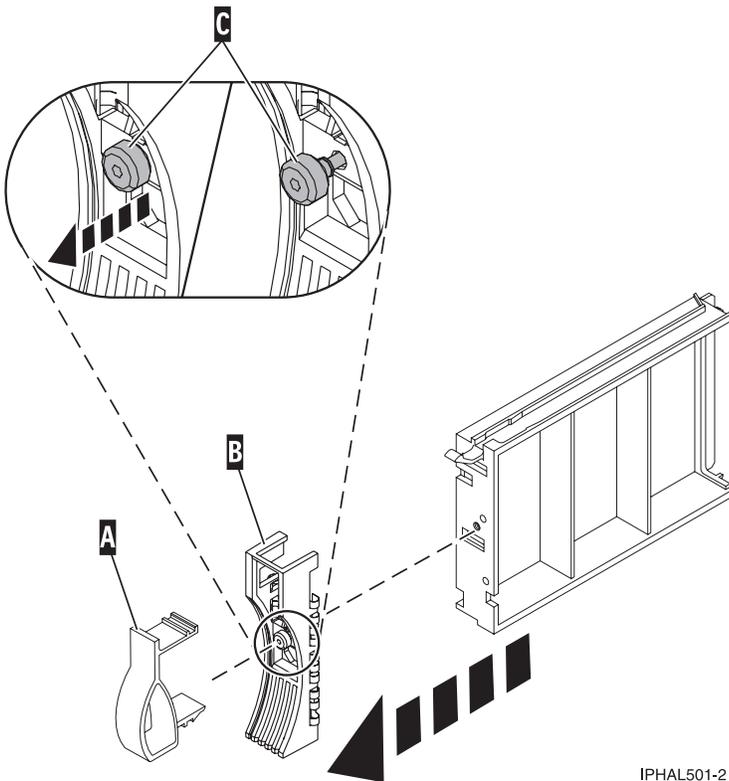


Figure 135. Removing a disk-drive bezel

6. Loosen and then pull out on the thumbscrew **C** to release the bezel **B** from the front edge of the filler.

Install a disk-drive filler

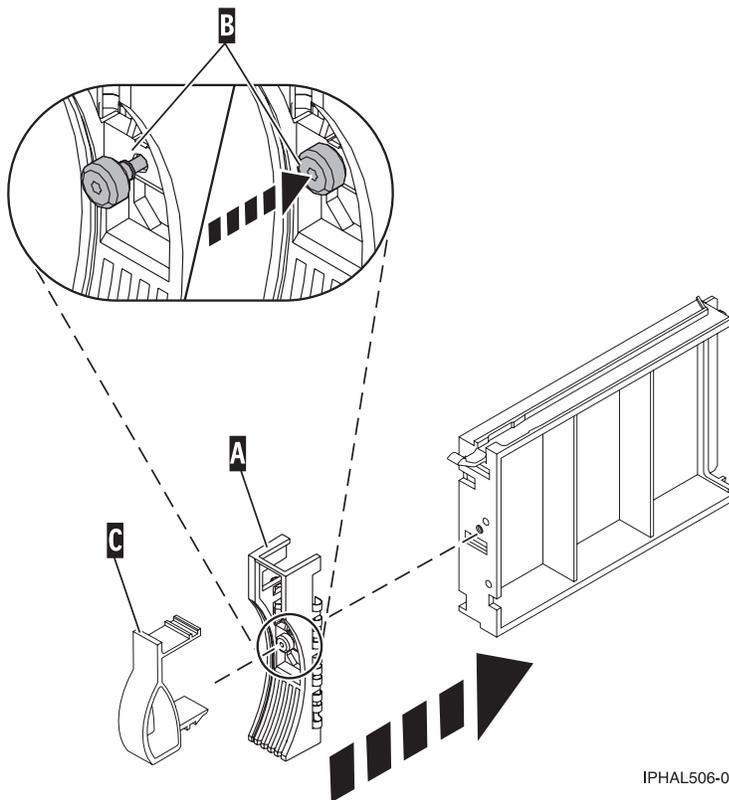
You might need to install a Small Computer System Interface (SCSI) disk-drive filler in the server or expansion unit. Use the procedure in this section to perform this task.

1. Attach the disk drive bezel **A** to the filler.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.
3. Install the disk-drive bezel latch **C** onto the front of the filler, as shown in the figure.



IPHAL506-0

Figure 136. Attaching a bezel to a disk-drive filler

4. Install the disk-drive filler in the system or expansion unit, as shown in the following figure.

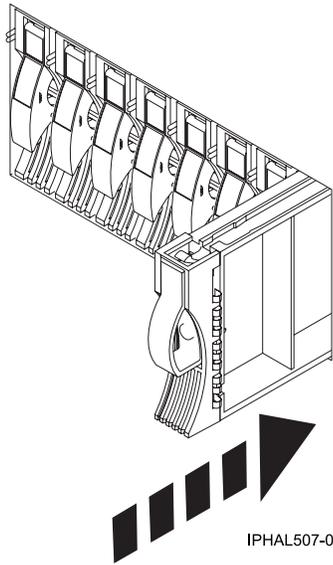


Figure 137. Installing a disk-drive filler

5. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Install the front cover on the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 190
 - “Install the front cover on the model 9116-561 or 570” on page 193
 - “Install the front cover on the model 51x or 710” on page 195
 - “Install the front cover on the 7311-D20 expansion unit” on page 196
 - If you have a front cover from any other models, remove the front cover.
6. Install or close the system, expansion unit or rack front door. For instructions on installing the system unit door, see “Install or replace the door on the model 285, 52x, 55x, or OpenPower 720” on page 173.

Disk drive locations

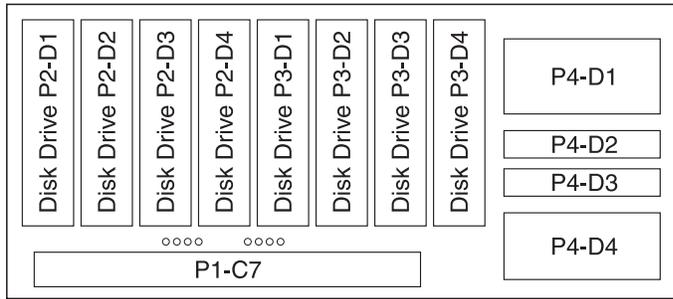
Find out where the disk drives are located on different models.

Locate your system or expansion unit to find the disk drive locations. If you are using logical partitions, go to Partitioning the server for more information.

Disk drive locations for models 285, 52x, 55x, and 720

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the IBM IntelliStation® POWER® 285, and the models 52x, 55x, and OpenPower 720.



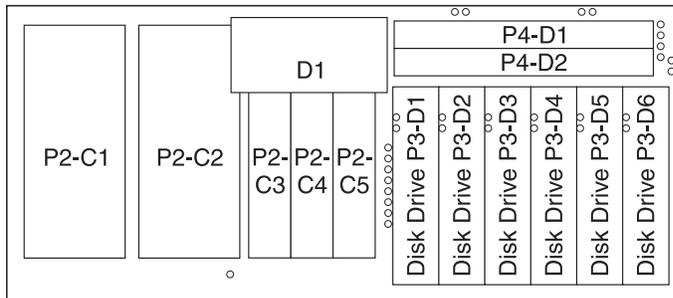
IPHAL550-1

Figure 138. Model 285, 52x, 55x, and 570 disk drive locations

Disk drive locations for models 9116-561 and 570

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the IBM models 9116-561 and 570.



IPHAL650-2

Figure 139. Model 9116-561 and 570 disk drive locations

Disk drive locations for models 7037-A50 and 7047-185

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the IBM models 7037-A50 and 7047-185.

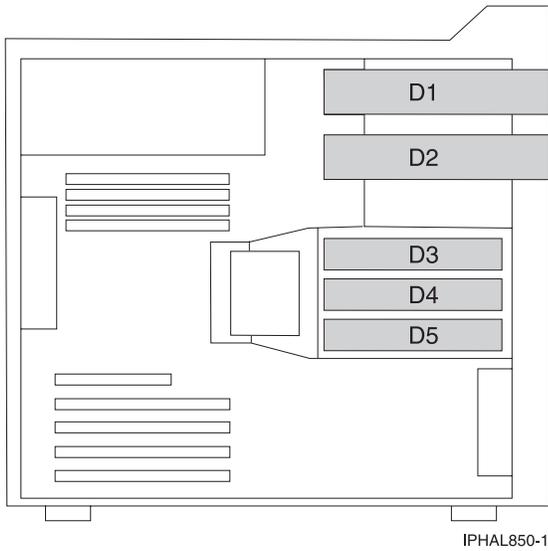


Figure 140. Model 7037-A50 and 7047-185 disk drive locations

Disk drive locations for the model 575

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the model 575.

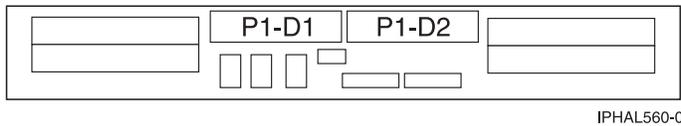


Figure 141. Model 575 disk drive locations

Disk drive locations for models 51x and 710

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the IBM models 51x and OpenPower 720.

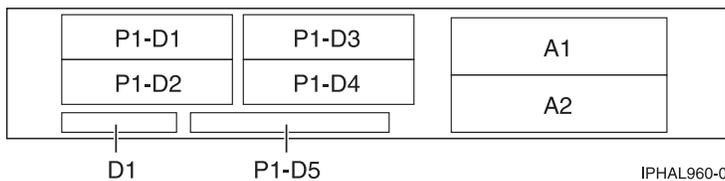
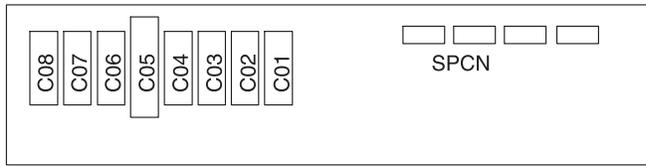


Figure 142. Models 51x and 710 disk drive locations

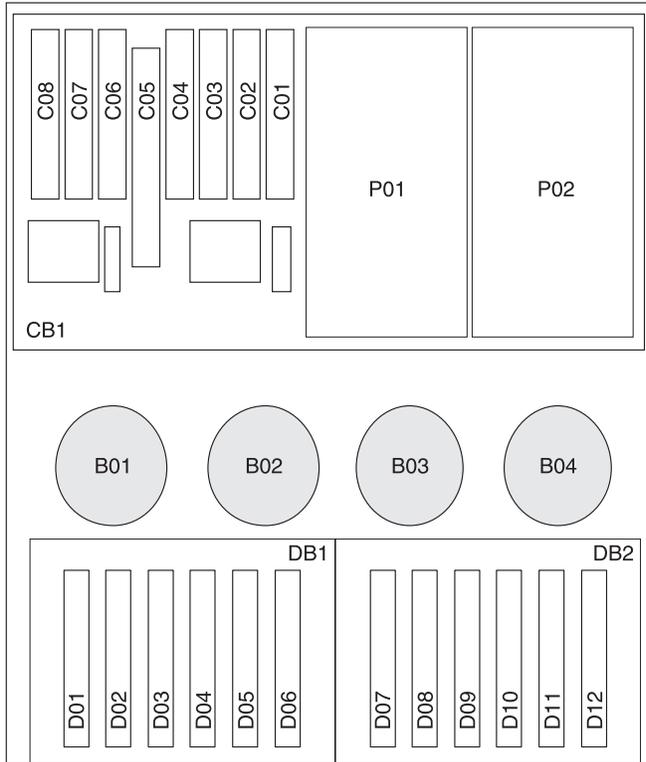
Disk drive locations for the 0595 expansion unit

Learn the disk drive locations for your expansion unit.

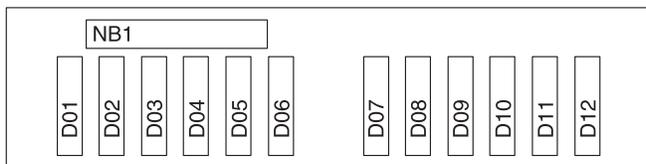
The following figure shows the disk drive locations for the 0595 expansion unit.



Back



Top



Front

RZAR6601-2

Figure 143. Model 0595 disk drive locations

Disk drive locations for the 5074 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 5074 expansion unit.

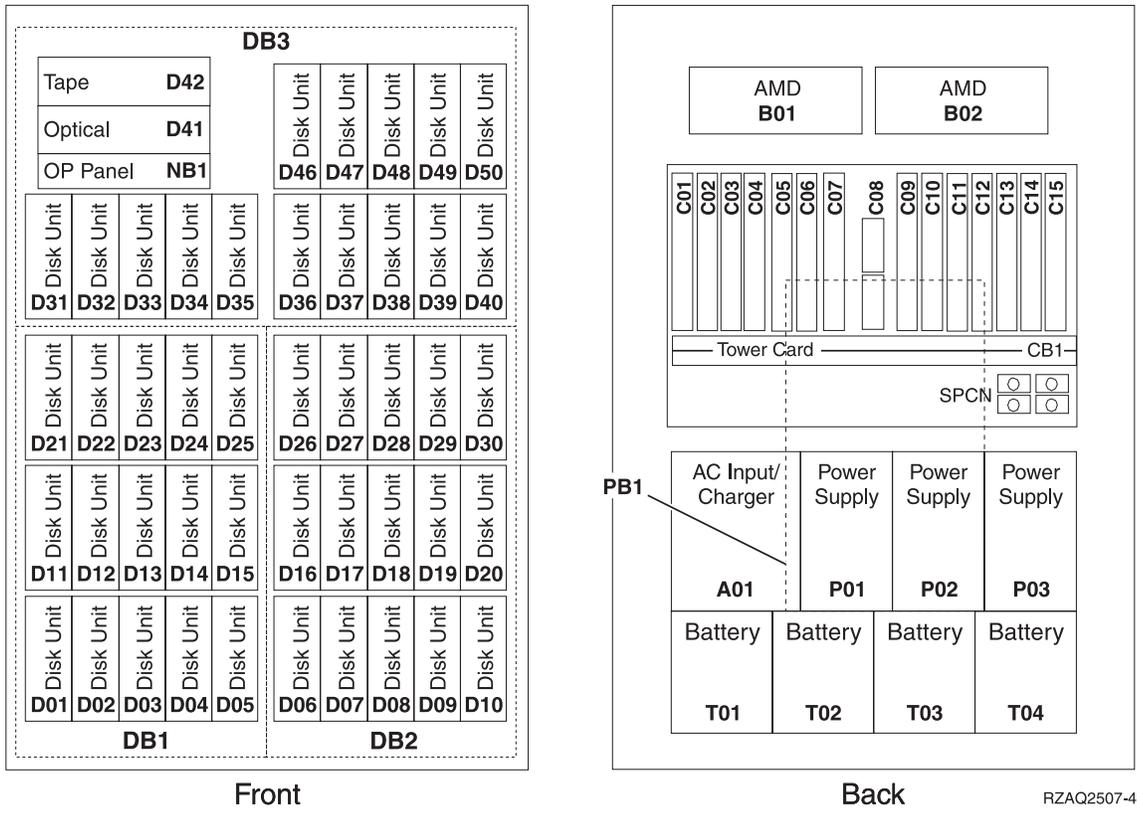


Figure 144. Disk drive locations for the 5074 expansion unit

Select the optimal disk drive position

Understand which disk drives to fill first in order to obtain better performance.

Refer to the label on the inside of the front cover of the expansion unit and install the disk drives in this order:

1. Fill all the disk drive positions that are controlled by the first disk-drive controller.
 - a. Fill the slot 1s: D31, D36, D46
 - b. Fill the slot 2s: D32, D37, D47
 - c. Fill the slot 3s: D33, D38, D48
 - d. Fill the slot 4s: D34, D39, D49
 - e. Fill the slot 5s: D35, D40, D50
2. Your expansion unit might require a second disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a second disk-drive controller.

Next fill the positions in this order:

- a. Fill the slot 1s: D01, D11, D21
- b. Fill the slot 2s: D02, D12, D22
- c. Fill the slot 3s: D03, D13, D23
- d. Fill the slot 4s: D04, D14, D24
- e. Fill the slot 5s: D05, D15, D25

3. Your expansion unit might require a third disk-drive controller before you can install disk drive into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a third disk-drive controller.

Fill the positions in this order:

- a. Fill the slot 1s: D06, D16, D26
- b. Fill the slot 2s: D07, D17, D27
- c. Fill the slot 3s: D08, D18, D28
- d. Fill the slot 4s: D09, D19, D29
- e. Fill the slot 5s: D10, D20, D30

Disk drive locations for the 5094 and 9194 expansion units

Learn the disk drive locations for your expansion unit.

The available disk drive locations depends on the number of disk-drive controllers installed in the expansion unit. New expansion units are configured such that the first three ports on the first disk-drive controller are connected in order to disk-drive enclosures DB3-0, DB3-1, and DB3-2. The next available port, which might be on the same controller or on a different controller is connected to DB1-0. The remaining available ports are connected in order to the following disk-drive enclosures:

- DB1-1
- DB1-2
- DB2-0
- DB2-1
- DB2-3

If the next available disk drive position is the first slot in a disk drive enclosure such as D21, D26, or D46, look at the disk-drive controller to verify that the enclosure is connected to a SCSI bus port. The controller end of the cable is clearly labeled with the disk-drive enclosure to which it connects. If the enclosure is not connected to a disk-drive controller, you must either install the disk drive in a different disk-drive enclosure or connect the enclosure to a SCSI bus port on a disk-drive controller. You might need to add a disk-drive controller before you can add disk drives to the expansion unit.

Figure 145 on page 144 shows the disk drive locations for the 5094 and 9194 expansion units.

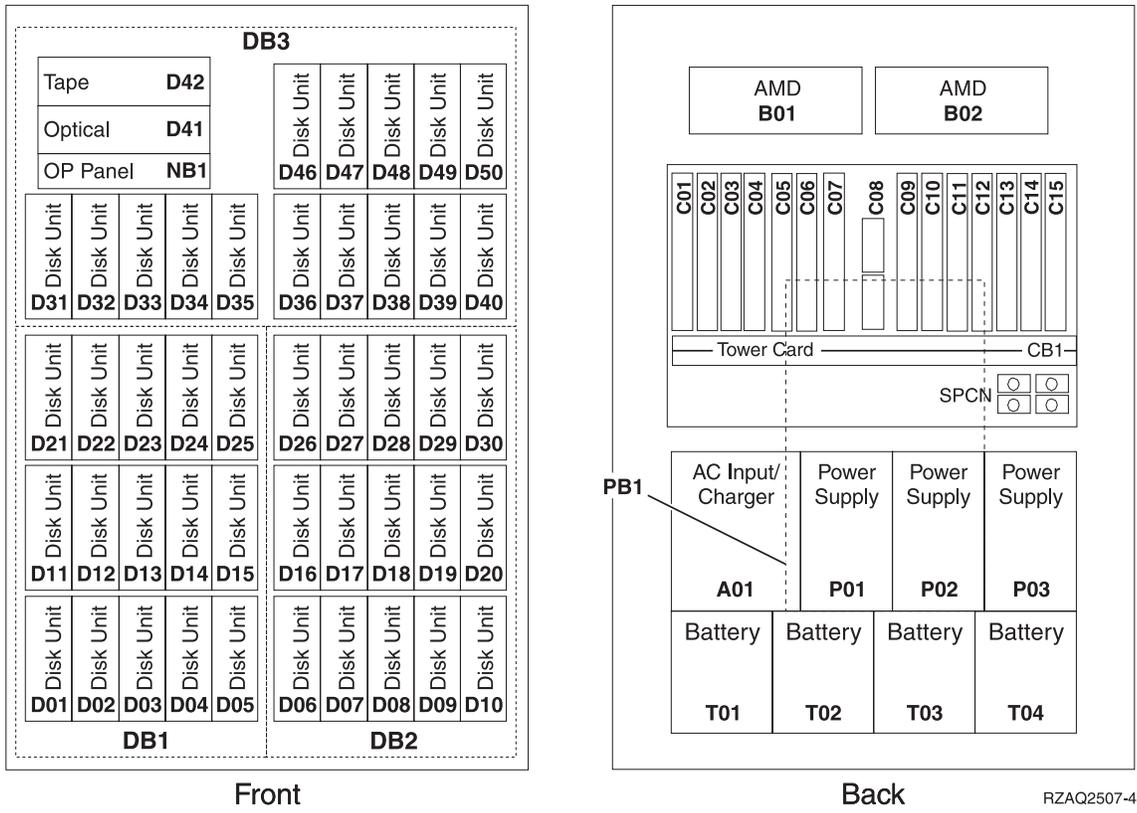


Figure 145. Disk drive locations for the 5094 and 9194 expansion units

Select the optimal disk drive position

Understand what disk drives to fill first in order to obtain better performance.

One method of populating an expansion unit is to install disk drives in available disk-drive enclosures from left to right. However, with the correct number and type of disk controllers installed, it is possible to optimize performance and availability by evenly distributing disk drives across disk controllers.

Refer to the label on the inside of the front cover on the expansion unit, and install the disk drives in this order:

1. Fill all the disk drive positions that are controlled by the first disk-drive controller.
 - a. Fill the slot 1s: D31, D36, D46
 - b. Fill the slot 2s: D32, D37, D47
 - c. Fill the slot 3s: D33, D38, D48
 - d. Fill the slot 4s: D34, D39, D49
 - e. Fill the slot 5s: D35, D40, D50
2. Your expansion unit might require a second disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a second disk-drive controller.

Fill the positions in this order:

 - a. Fill the slot 1s: D01, D11, D21
 - b. Fill the slot 2s: D02, D12, D22
 - c. Fill the slot 3s: D03, D13, D23

- d. Fill the slot 4s: D04, D14, D24
 - e. Fill the slot 5s: D05, D15, D25
3. Your expansion unit requires a third disk-drive controller before you can install disk drive into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a third disk-drive controller.

Last fill the positions in this order:

- a. Fill the slot 1s: D06, D16, D26
- b. Fill the slot 2s: D07, D17, D27
- c. Fill the slot 3s: D08, D18, D28
- d. Fill the slot 4s: D09, D19, D29
- e. Fill the slot 5s: D10, D20, D30

Disk drive locations for the 5095 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 5095 expansion unit.

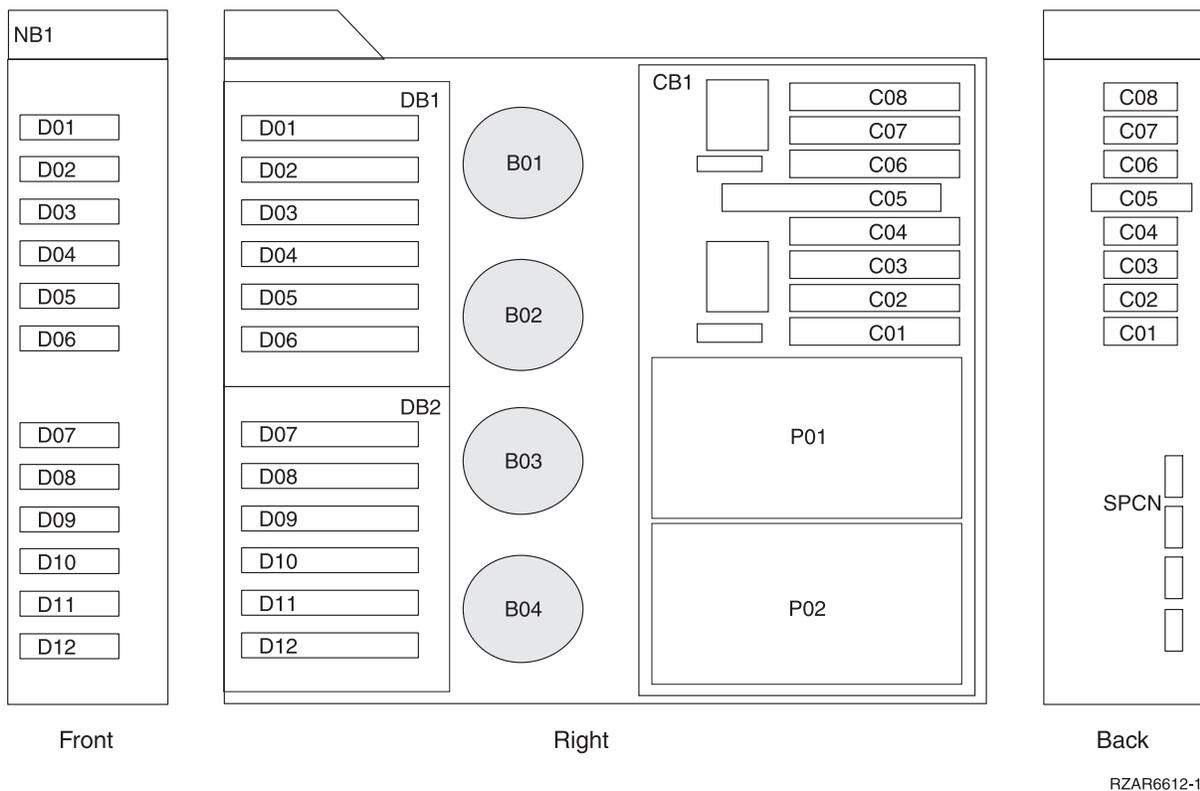


Figure 146. Disk drive locations for the 5095 expansion unit

Disk drive locations for the 5079 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 5079 expansion unit.

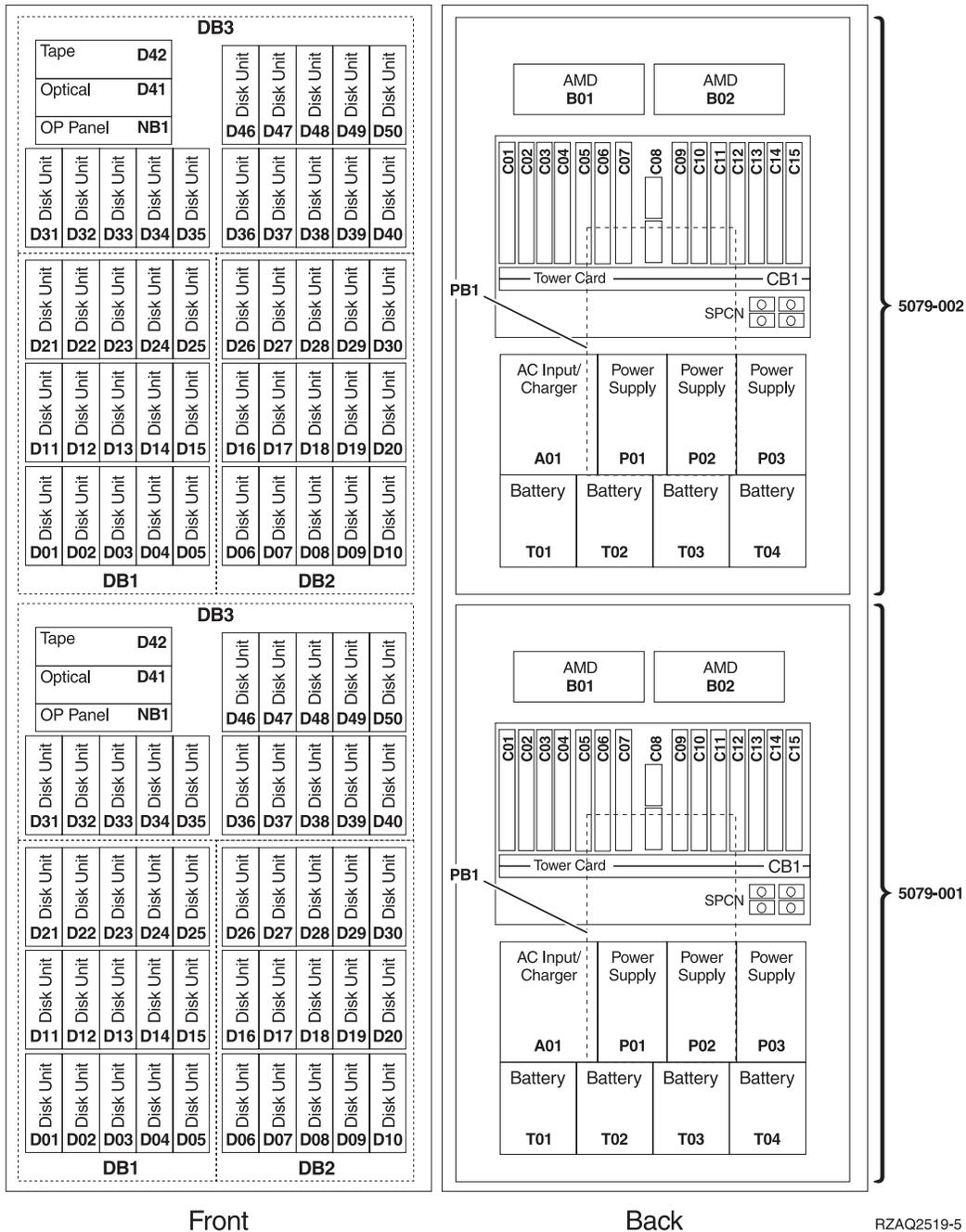


Figure 147. Disk drive locations for the 5079 expansion unit

Select the optimal disk drive position

Understand what disk drives to fill first in order to obtain better performance.

Note: The 5079 consists of the following independent expansion units: 5079-001 and 5079-002. Installation rules and procedures apply to each expansion unit independently.

Refer to the label on the inside of the front cover of the expansion unit and install the disk drives in this order:

1. Fill all the disk drive positions that are controlled by the first disk-drive controller.

- a. Fill the slot 1s: D31, D36, D46
 - b. Fill the slot 2s: D32, D37, D47
 - c. Fill the slot 3s: D33, D38, D48
 - d. Fill the slot 4s: D34, D39, D49
 - e. Fill the slot 5s: D35, D40, D50
2. Your expansion unit requires a second disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a second disk-drive controller.
- Next fill the slots in this order:
- a. Fill the slot 1s: D01, D11, D21
 - b. Fill the slot 2s: D02, D12, D22
 - c. Fill the slot 3s: D03, D13, D23
 - d. Fill the slot 4s: D04, D14, D24
 - e. Fill the slot 5s: D05, D15, D25
3. Your expansion unit requires a third disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a third disk-drive controller.
- Last fill the slots in this order:
- a. Fill the slot 1s: D06, D16, D26
 - b. Fill the slot 2s: D07, D17, D27
 - c. Fill the slot 3s: D08, D18, D28
 - d. Fill the slot 4s: D09, D19, D29
 - e. Fill the slot 5s: D10, D20, D30

Disk drive locations for the 5294 and 8294 expansion units

Learn the disk drive locations for your expansion unit.

The available disk drive locations depends on the number of disk-drive controllers installed in the expansion unit. New expansion units are configured such that the first three ports on the first disk-drive controller are connected, in order, to disk-drive enclosures DB3-0, DB3-1, and DB3-2. The next available port, which might be on the same controller or on a different controller, is connected, to DB1-0. The remaining available ports are connected in order, to the following disk-drive enclosures:

- DB1-1
- DB1-2
- DB2-0
- DB2-1
- DB2-3

If the next available disk drive position is the first slot in a disk drive enclosure such as D21, D26, or D46, look at the disk-drive controller to verify that the enclosure is connected to a SCSI bus port. The controller end of the cable is labeled with the disk-drive enclosure to which it connects. If the enclosure is not connected to a disk-drive controller, you must either install the disk drive in a different disk-drive enclosure or connect the enclosure to a SCSI bus port on a disk-drive controller.

Restriction: You might need to add a disk-drive controller before you can add disk drives to the expansion unit.

Figure 148 on page 148 shows the disk drive locations for the 5294 and 8294 expansion units.

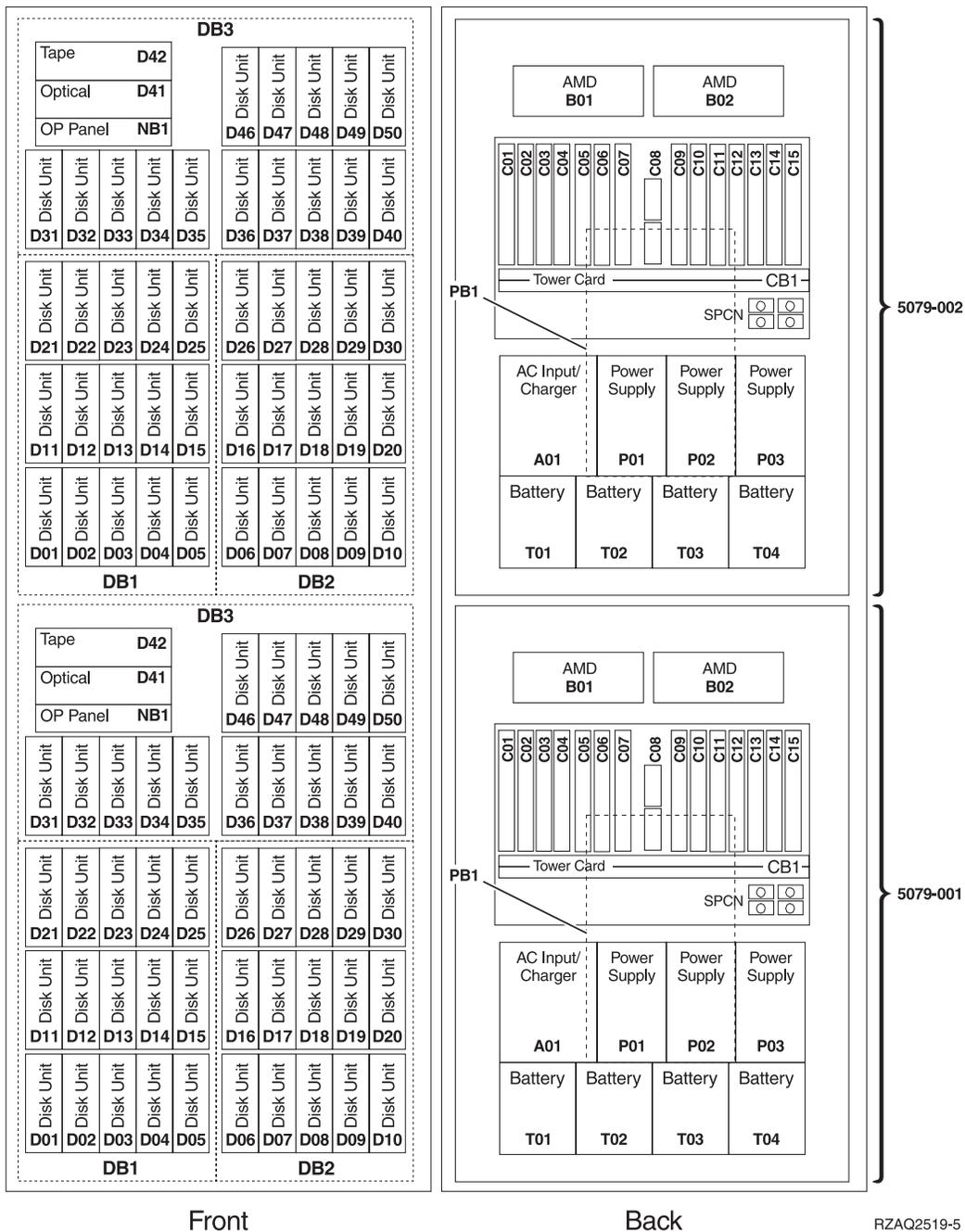


Figure 148. Disk drive locations for the 5294 and 8294 expansion unit

Select the optimal disk drive position

Understand what disk drives to fill first, in order, to obtain better performance.

One method of populating this expansion unit is to install disk drives in available disk-drive enclosures from left to right. However, with the correct number and type of disk controllers installed, it is possible to optimize performance and availability by evenly distributing disk drives across disk controllers.

Note: The 5294 and the 8294 consist of two independent expansion units. Installation rules and procedures apply to each expansion unit independently.

Refer to the label on the inside of the front cover and install the disk drives in this order:

1. First fill all the disk drive positions that are controlled by the first disk-drive controller.
 - a. Fill the slot 1s: D31, D36, D46
 - b. Fill the slot 2s D32, D37, D47
 - c. Fill the slot 3s: D33, D38, D48
 - d. Fill the slot 4s: D34, D39, D49
 - e. Fill the slot 5s: D35, D40, D50
2. Your expansion unit requires a second disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a second disk-drive controller.

Next fill the slots in this order:

- a. Fill the slot 1s: D01, D11, D21
 - b. Fill the slot 2s: D02, D12, D22
 - c. Fill the slot 3s: D03, D13, D23
 - d. Fill the slot 4s: D04, D14, D24
 - e. Fill the slot 5s: D05, D15, D25
3. Your expansion unit requires a third disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a third disk-drive controller.

Last fill the slots in this order:

- a. Fill the slot 1s: D06, D16, D26
- b. Fill the slot 2s: D07, D17, D27
- c. Fill the slot 3s: D08, D18, D28
- d. Fill the slot 4s: D09, D19, D29
- e. Fill the slot 5s: D10, D20, D30

Disk drive locations for the 5791 and 7040-61D expansion units

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 5791 and 7040-61D expansion unit.

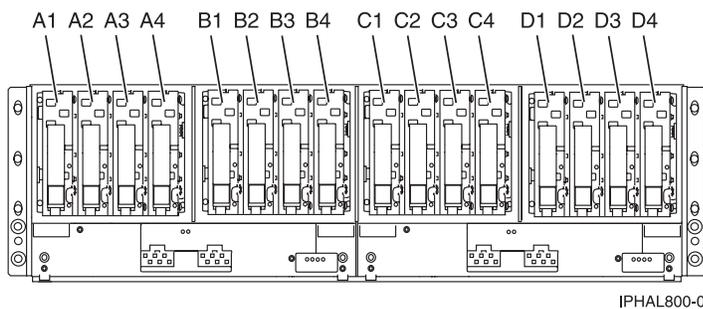


Figure 149. Disk drive locations for the 5791 and 7040-61D expansion units

Disk drive locations for the 5794 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 5794 expansion unit.

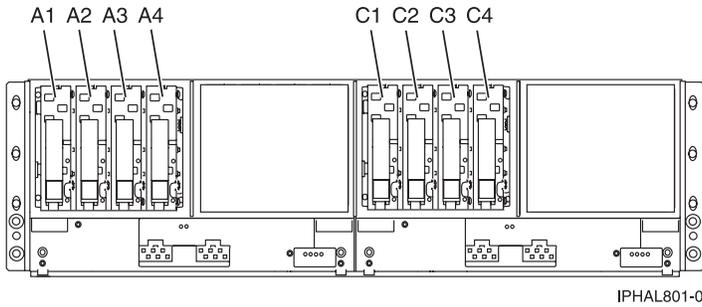


Figure 150. Disk drive locations for the 5794 expansion unit

Disk drive locations for the 7311-D20 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 7311-D20 expansion unit.

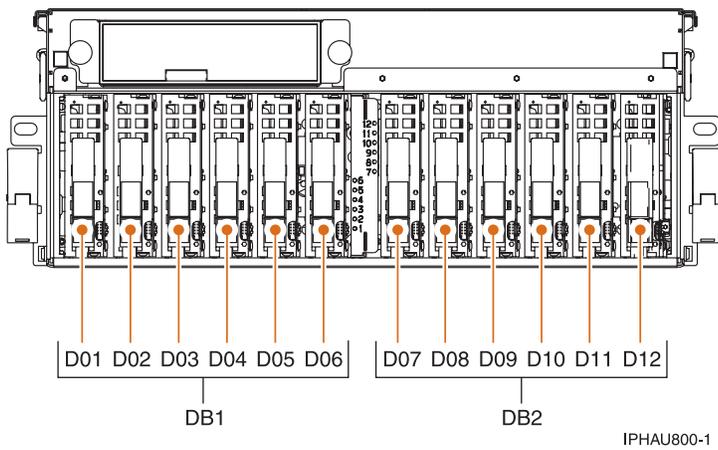


Figure 151. Disk drive locations for the 7311-D20 expansion unit

Disk drive locations for the 505 disk drive enclosure

Learn the disk drive locations for your disk-drive enclosure.

The following figure shows the disk drive locations for the 505 disk drive enclosure.

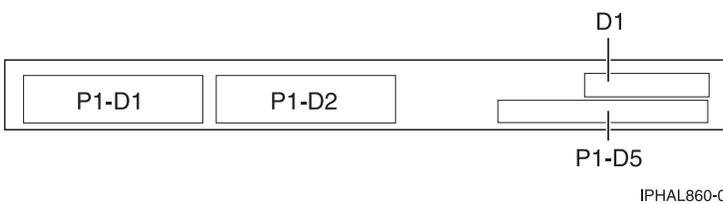


Figure 152. Disk drive locations for the 505 disk drive enclosure

Select the optimal disk drive position

Understand what disk drives to fill first, in order, to obtain better performance.

One method of populating this expansion unit is to install disk drives in available disk-drive enclosures from left to right. However, with the correct number and type of disk controllers installed, it is possible to optimize performance and availability by evenly distributing disk drives across disk controllers.

Refer to the label on the inside of the front cover and install the disk drives in this order:

1. Fill all the disk drive positions that are controlled by the first disk-drive controller.
 - a. Fill the slot 1s: D31, D36, D46
 - b. Fill the slot 2s: D32, D37, D47
 - c. Fill the slot 3s: D33, D38, D48
 - d. Fill the slot 4s: D34, D39, D49
 - e. Fill the slot 5s: D35, D40, D50
2. Your expansion unit might require a second disk-drive controller before you can install disk drives into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a second disk-drive controller.

Next fill the positions in this order:

- a. Fill the slot 1s: D01, D11, D21
 - b. Fill the slot 2s: D02, D12, D22
 - c. Fill the slot 3s: D03, D13, D23
 - d. Fill the slot 4s: D04, D14, D24
 - e. Fill the slot 5s: D05, D15, D25
3. Your expansion unit requires a third disk-drive controller before you can install disk drive into the following positions. Contact IBM or an authorized dealer if your expansion unit does not have a third disk-drive controller.

Last fill the positions in this order:

- a. Fill the slot 1s: D06, D16, D26
- b. Fill the slot 2s: D07, D17, D27
- c. Fill the slot 3s: D08, D18, D28
- d. Fill the slot 4s: D09, D19, D29
- e. Fill the slot 5s: D10, D20, D30

Disk drive locking device

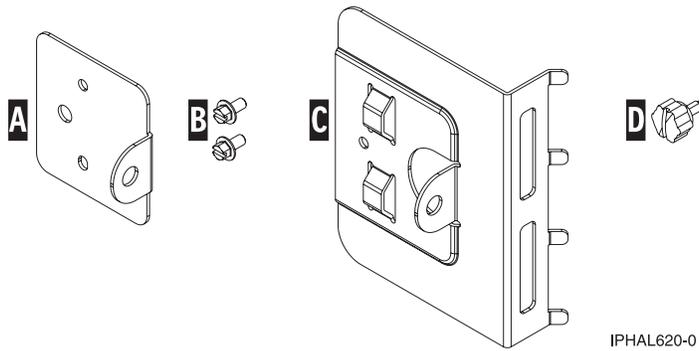
Use the disk drive locking device to ensure that your disk drives are appropriately secure. This lock can only be used only on stand-alone systems. Complete the procedure in this section to install the device.

1. Remove the door to the system unit or expansion unit. For instructions on removing the stand-alone system unit door, see “Remove the door from the model 285, 52x, 55x, or OpenPower 720” on page 171.

Attention:

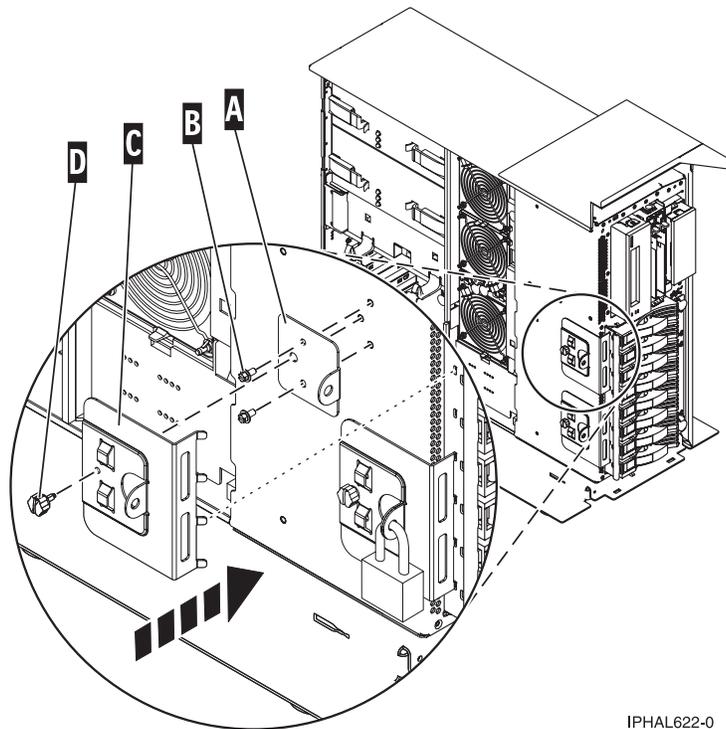
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Remove the front cover. For instructions on removing the cover, see “Remove the front cover from the model 285, 52x, 55x, OpenPower 720, or the 0595 expansion unit” on page 188.

3. On the system, tighten plate **A** to the server using screws **B**. Place plate **C** over **A** and tighten with thumb screw **D**, as shown in the following figure.



IPHAL620-0

Figure 153. Disk drive locking device materials



IPHAL622-0

Figure 154. Installing a locking device on stand-alone system

4. Install the system unit door or close the rack front door. For instructions on installing the system unit door, see "Install or replace the door on the model 285, 52x, 55x, or OpenPower 720" on page 173.

Tip: To lock the system, use a 3/16 inch (4.76 millimeters) shackle.

To prevent difficulty in reinstalling the cover, ensure that:

- The lock thickness is 7/16 inch (11.11 millimeters) or less.
- The lock is not wider than 1 1/4 inch (31.75 millimeters).

Related Information

Locate additional disk-drive related information and instructions you might need.

Disk-drive concurrent maintenance lights

Find out where the concurrent maintenance lights are located on different models.

Locate your system or expansion unit to find the locations of the concurrent maintenance lights.

Disk-drive concurrent maintenance lights for model 505

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light **A** for the IBM model 505.

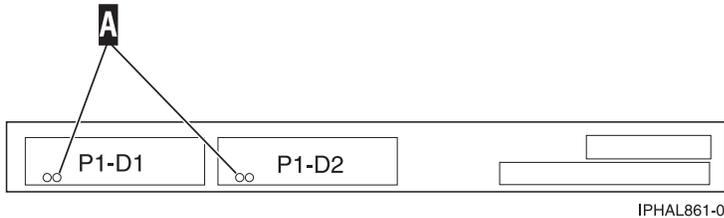


Figure 155. Model 505 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for models 285, 52x, 55x, and 720

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light **A** for the IBM IntelliStation POWER 285, and the models 52x, 55x, and OpenPower 720.

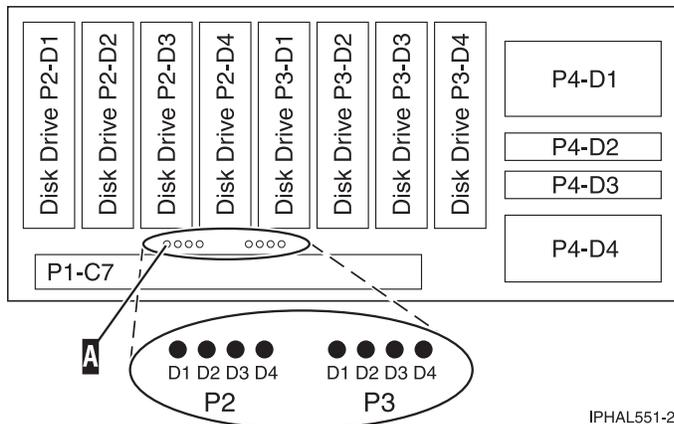
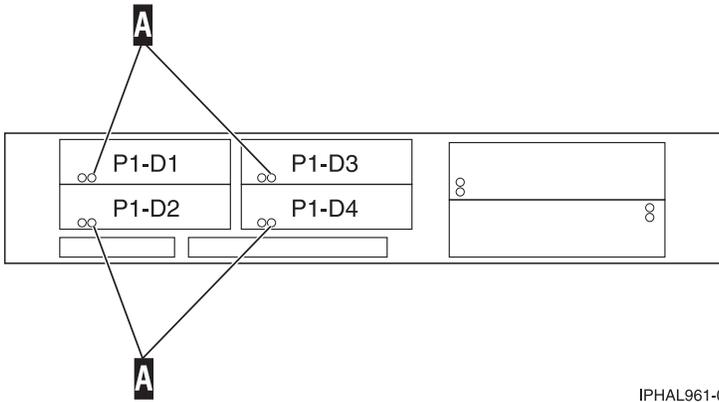


Figure 156. Model 285, 52x, 55x, and 720 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for models 51x and 710

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light **A** for the IBM models 51x and OpenPower 710.



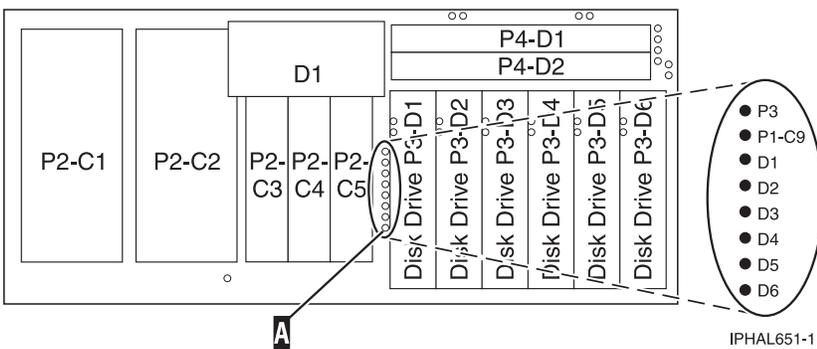
IPHAL961-0

Figure 157. Model 51x and 710 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for models 9116-561 or 570

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light A for the IBM models 9116-561 or 570.



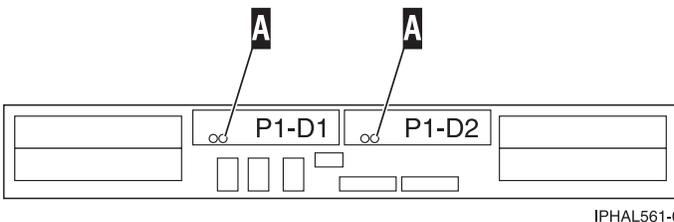
IPHAL651-1

Figure 158. Model 9116-561 or 570 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for model 575

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light A for the IBM model 575.



IPHAL561-0

Figure 159. Model 575 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for model 7311-D20

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figure shows the locations of the disk-drive concurrent maintenance light **A** for the IBM model 7311-D20.

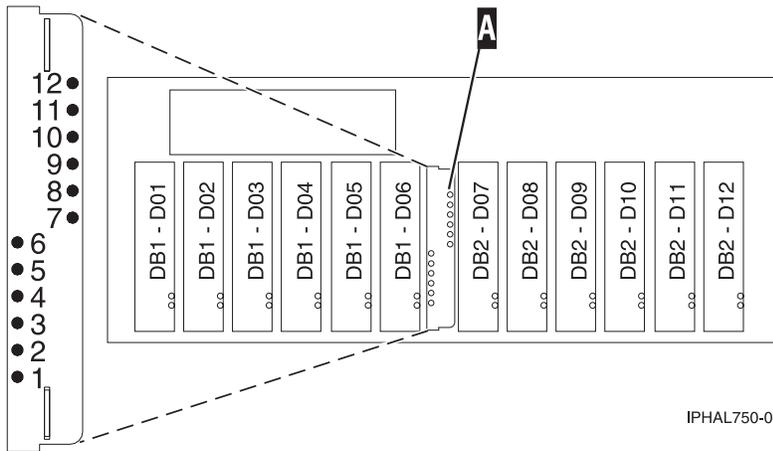


Figure 160. Model 7311-D20 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figures show the locations of the disk-drive concurrent maintenance light **A** for the IBM models 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure.

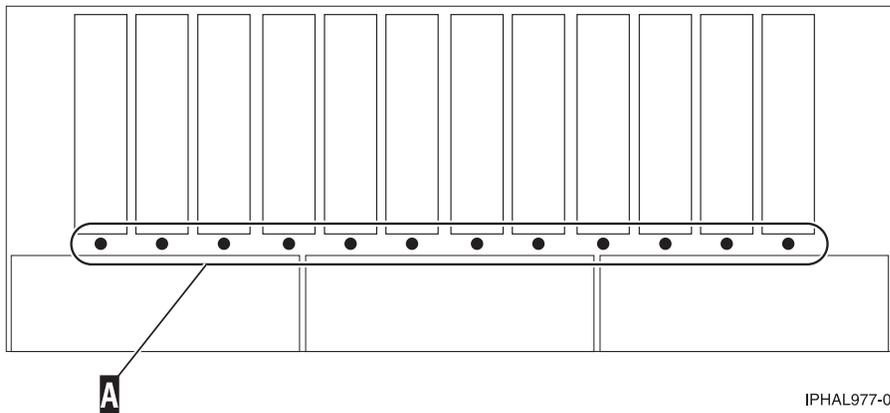


Figure 161. Front view of model 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure concurrent maintenance lights

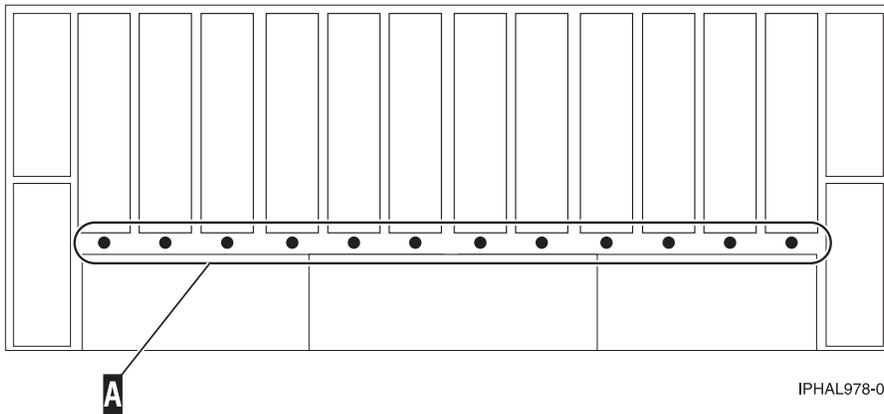


Figure 162. Back view of model 5786, 5787, 7031-D24 or 7031-T24 SCSI disk-drive enclosure SCSI disk-drive enclosure concurrent maintenance lights

Prepare to remove a disk drive from a system or expansion unit controlled by AIX

Learn the actions you need to take to properly remove a disk drive.

Before removing a disk drive from a system or expansion unit that is controlled by AIX, ensure that all data on that disk drive or the array that contains the drive is backed up and removed from the disk drive and that the disk drive is in the Defined state.

If the disk drive is attached to a PCI-X SCSI RAID controller, see the *PCI-X SCSI RAID Controller Reference Guide for AIX*. If the disk drive is attached to another controller, see the information for that controller or the *AIX System Management Guide: Operating System and Devices*. These guides are available at the System p and AIX Information Center. (<http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp>)

Prepare to remove a disk drive from a system or expansion unit controlled by i5/OS

Learn the actions you need to take to properly remove a disk drive.

Before removing a disk drive from a system or expansion unit that is controlled by i5/OS, follow these steps:

1. Determine the protection status of the disk drive that you are replacing. For instructions, see "Determine the i5/OS disk drive protection status" on page 157.
2. The service provider must perform one of the following tasks:
 - Save data and initialize the disk drive
 - Initialize the disk drive and copy to disk
3. **For mirrored disk drives** on an i5/OS system or logical partition, follow these steps to verify that the disk drive you are replacing has been suspended:
 - a. Sign on with service level authority.
 - b. Type `strsst` on the command line of the i5/OS session and press Enter.
 - c. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Remember: The service tools password is case sensitive.

- d. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.

- e. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
- f. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.
- g. Does the disk drive that is mirrored to the disk drive that you are replacing (same drive number) have a status of Active?
 - **No:** The replacement must be performed by a service provider. Use exchange a disk drive with mirrored protection to exchange a disk drive that has protection.
 - **Yes:** Does the disk drive that you are replacing have a status of Suspended?
 - **Yes:** Continue with the next step.
 - **No:** Follow these steps to suspend mirrored protection on the disk drive that you are replacing:
 - 1) Press F3 from the Display Disk Configuration display to return to the Work with Disk Units display.
 - 2) Select **Work with Disk Unit Recovery** from the Work with Disk Units display. Press Enter.
 - 3) Select **Suspend mirrored protection** from the Work with Disk Unit Recovery display. Press Enter.
 - 4) Select the option to suspend the disk drive that you are replacing from the Suspend Mirrored Protection display. Press Enter.
- h. Press F3 repeatedly to exit System Service Tools and return to the main menu.

Determine the i5/OS disk drive protection status

To determine the protection status of the disk drives in your i5/OS system or logical partition, follow these steps from the System Service Tools (SST) display:

Tip: If you do not know the protection status of the disk drives and you cannot get to the System Service Tools display, contact your next level of support.

1. Sign on **with at least service level authority**.
2. Type `strsst` on the command line of the i5/OS session and press Enter.
3. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Note: The service tools password is case-sensitive.

4. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.
5. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
6. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.

A list of each auxiliary storage pool (ASP) displays, showing the disk drives that are members of the ASP. The Status column shows one of the following protection statuses for the ASP:

- **Mirrored.** These ASPs are configured for mirrored protection. If the failing disk drive has mirrored protection, record the status of both disk drives in the mirrored pair. You need this information in the recovery procedure.
- **Unprotected.** An ASP with a status of Unprotected might contain disk drives that are device parity protected. Record the status of the failing disk drive as it is shown in the Status column of the Display Disk Configuration Status display.

A disk drive with one of the following statuses has device parity protection only if all other disk drives in the array are operational:

- DPY/Active
- DPY/Failed
- DPY/HDW Failure

- DPY/Degraded
- DPY/Power Loss
- DPY/Not Ready
- DPY/Unknown

A disk drive with any other status (such as DPY/Rebuild or DPY/Unprotected) does not have device parity protection.

Examples:

- Suppose one disk drive has a status of DPY/Failed while all other disk drives have a status of DPY/Unprotected. In this case, only the disk drive with the DPY/Failed status is protected. Servicing the failed disk drive does not result in data loss. Removing any of the unprotected disk drives might result in data loss.
- All disk drives have a status of DPY/Active or DPY/Degraded, therefore, all disk drives are protected. In this case, exchanging any disk drive does not result in data loss.

Tip: For more information about the meaning of a status for any disk drive, use the Help key on the display.

Prepare a disk drive for use in an AIX system or logical partition

Configure the newly installed disk drive for your environment.

If the disk drive is attached to a PCI-X SCSI RAID controller, see the *PCI-X SCSI RAID Controller Reference Guide for AIX*. If the disk drive is attached to another controller, see the *AIX System Management Guide: Operating System and Devices*. These guides are available at the System p and AIX Information Center. (<http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp>)

Configure a disk drive in an i5/OS system or logical partition

To configure a newly installed disk drive into an existing device parity set, follow these steps:

If you want to start a new device parity set or change the protection on your disks, see *Manage your disks* or *Start device parity protection*.

1. If necessary, start System Service Tools (SST) by typing `strsst` on the command line of the i5/OS session and pressing Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Restriction: The service tools password is case sensitive.

3. Select **Work with Disk Units** on the System Service Tools display. Press Enter.
4. Select **Display disk configuration** on the Work with Disk Units display. Press Enter.
5. Select **Display non-configured units** on the Display disk configuration display. Press Enter.
6. The disk drive that you installed is listed. The serial number should match the serial number you recorded (the last 4 digits).

Note: The new disk drive might take up to five minutes to appear in the list. If the disk drive is not listed, ensure that the disk drive was properly installed.

7. Press F12 twice.
8. Select **Work with disk configuration** on the Work with Disk Units display. Press Enter.
9. Are you adding a disk drive to an existing device parity set?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 23 on page 159 for mirroring or no protection, go to 1 on page 160 for hot spare.

Tip: Select **No** for mirroring, hot spare or no protection.

10. Select **Work with device parity protection** on the Work with Disk Configuration display. Press Enter.
11. Select **Include unit in device parity protection** on the Work with Device Parity Protection display. Press Enter.
12. Did the Include Device Parity Protection Failed display appear?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 15.
13. The following conditions must be met before you can start device parity protection.
 - If there are enough disk drives available to create a new parity set, the drives are eligible for *Start Device Parity Protection* operation and not for the *Include Device Parity Protection* operation.
 - All disk drives in a parity set must be the same capacity with a minimum number of three or four disk drives and maximum of 10 or 18 disk drives in the resulting parity set, depending on the disk drive type.
 - Not all disk drives attached to an advanced function input output processor have reported to the system. Retry the operation.
 - The type or model of the disk drives cannot be used for the requested operation.When these conditions are met, press F12 to return to the Work with Disk Configuration display.
14. Select **Include unit in device parity protection** on the Work with disk configuration display. Press Enter.
15. On the Include Disk Units in Device Parity Protection display, select the disk drives to be included in Device Parity Protection. Type a **1** in the Option column. Press Enter.
16. Press Enter to confirm your choice. The configuration starts and might take 30 to 60 minutes to complete.
17. When the device parity protection is complete, the message “Selected drives have been included successfully” is shown on the Work with device parity protection display. Press F12.
18. Select **Display disk configuration** on the Work with disk configuration display. Press Enter.
19. Select **Display disk configuration status** on the Display disk configuration display.
20. If you have more than one ASP, determine the auxiliary storage pool (ASP) to which you want to add the disk drive.
21. Press F12 twice to get to the Work with Disk Units display.
22. Select **Work with disk configuration** on the Work with Disk Units display. Press Enter.
23. Select the option to add units to ASPs and balance data on the Work with disk configuration display. Press Enter.
24. Specify the number of the ASP to which you want to add the disk drive. The system ASP is **ASP 1**. Press Enter.

Notes:

- a. If ASP is mirror protected, disk drives must be added in pairs of the same size.
 - b. When one or more pairs of disk drives are added to a mirrored ASP, they automatically become mirror protected.
 - c. To start mirrored protection on an ASP, refer to the Backup and Recovery manual .
25. The Confirm Add Units display is shown showing the configuration your system will have when the add operation completes.

Note: If you have selected the wrong ASP, press F12 to change your options. Press the Enter key to continue. The add process will take several minutes to complete.

26. When the message Selected units have been added successfully is shown, press F3 three times and press Enter to return to the Main Menu display.

27. If you have a printer, print the configuration list. A service provider might refer to the configuration list in the future.
 - a. You need to sign on **with at least service level authority**
 - b. Type `strsst` on the Main Menu command line. Press Enter.
 - c. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Remember: The service tools password is case sensitive.

- d. Select **Start a service tool** on the System Service Tools (SST) display. Press Enter.
 - e. Select **Hardware service manager** on the Start a Service Tool display. Press Enter.
 - f. Press F6 (print the configuration) from the Hardware Service Manager display.
 - g. To return to the Main Menu display, press F3 (Exit) twice and then press Enter.
 - h. Place the configuration list where you can refer to it in the future.
28. If you are a service provider performing this task, return to the procedure that sent you here.
 1. Select **Work with hot spare protection** from the **Work with disk configuration** menu.
 2. Select **Start device parity protection - RAID 5 with hot spare** or **Start device parity protection - RAID 6 with hot spare** depending on the level of parity protection that is desired.
 3. Return to the procedure that sent you here.

Rebuild data on a replacement disk drive using AIX

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

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

For more information, see the *AIX System Management Guide: Operating System and Devices*. These guides are available at the System p and AIX Information Center. (<http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp>)

Rebuild data on a replacement disk drive using i5/OS

Learn how to rebuild data on replacement disk.

To rebuild data on the replacement disk drive, complete the following steps:

1. If necessary, start System Service Tools (SST) by typing `strsst` on the command line of the i5/OS session and pressing Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.

Note: The service tools password is case sensitive.

3. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.
4. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
5. If you determined that the disk drive you replaced had **device parity protection (RAID)**, follow these steps to restore device parity protection (RAID) on the disk drive:
 - a. Select **Rebuild disk unit data** on the Work with Disk unit recovery display. Press Enter.
 - b. Select **1** to rebuild the disk drive displayed (the disk drive displayed is the disk drive that you **removed**) on the Rebuild Disk Unit Data display. Press Enter.

- c. Press Enter on the Confirm Rebuild Disk Unit Data display. The rebuild process might take several minutes to complete.
 - d. Press F5 to refresh the display until the **Percent complete** shows 5%.
 - e. When the display shows at least 5% complete, you can either continue to monitor this display to completion, or press F3 (Exit) to return to the Work with disk units display.
 - f. Press F3 (Exit) to return to the System service tools display.
 - g. Press F3 (Exit) to return to the Exit SST display and press Enter.
 - h. Return to the procedure that sent you here.
6. If the disk drive that you replaced had **mirrored protection**, follow these steps:
- a. Select **Replace configured unit** on the Work with Disk unit recovery display. Press Enter.
 - b. Select the configured disk drive that you are exchanging (suspended drive) on the Select Configured Unit to Replace display. Press Enter.
 - c. Select the disk drive that you just installed on the Select Replacement Unit display. This drive has a non-configured status.

Note: In some cases, it might take several minutes for a new disk drive to display. Repeat these steps until the new drive is shown.
Press Enter.

- d. Press Enter on the Confirm Replace of Configured Unit display to confirm your choice for replacement.

The replacement process might take several minutes to complete. When the process is complete, the Work with Disk unit recovery display is shown.

- e. Press F3 (Exit) to return to the Work with disk units display.
- f. Select **Display disk configuration** on the Work with disk units display.
- g. Select **Display disk configuration status** on the Display Disk Configuration display.

Mirrored status shows Resuming. When complete, the mirrored status shows Active. This process might take several minutes to complete. You can either monitor this display to completion, or press F3 (Exit) three times, and then press Enter to return to the i5/OS main menu.

Rebuild data on a replacement disk drive using Linux

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

For an unprotected disk drive

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

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

For information on these tasks, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*. This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

For a disk drive in a RAID Level 5 or RAID Level 10 disk array, select the appropriate procedure:

Rebuild data on a disk drive using Linux kernel 2.4

Complete the steps listed here to rebuild your data.

If a hot-spare disk drive was available and protected the disk array throughout the disk drive failure, you can configure the newly installed disk drive as a hot spare. For instructions, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

If a hot spare rebuild was not initiated by the controller, you need to initiate a rebuild on the newly installed disk drive. To initiate the rebuild, follow these steps:

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter. The Work with Disk Units display is shown.
3. From the Work with Disk Units display, select **Work with disk unit recovery**. The Work with Disk Unit Recovery display is shown.
4. From the Work with Disk Unit Recovery display, select **Rebuild disk unit data**.
A Rebuild Disk Unit Data display similar to the following figure is shown below.

```
Rebuild Disk Unit Data

Select the units to be rebuilt

Type choice, press Enter.
1=Rebuild

Option      Vendor   Product          Serial   PCI   PCI   SCSI   SCSI   SCSI
            ID     ID              Number  Bus   Dev   Bus   ID    Lun
            IBM    IC35L036UCDY10-0 E3V0J55B 353    01    0     5     0

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

Figure 163. Example Rebuild Disk Unit Data display

5. Type option 1 (Rebuild) next to the disk drive you want to rebuild and press Enter.

Note: Performing a rebuild on a disk drive overwrites the data currently on the disk drive. A Confirm Rebuild Disk Unit Data display similar to the following figure shown below.

```

Confirm Rebuild Disk Unit Data

Rebuilding the disk unit data could take several minutes for
each unit selected.

Press Enter to confirm having the data rebuilt.
Press q=Cancel to return and change your choice.

Option  Vendor      Product          Serial      PCI      PCI      SCSI  SCSI  SCSI
        ID          ID              Number     Bus      Dev     Bus   ID    Lun
   1     IBM        IC35L036UCDY10-0  E3V0J55B  353      01      0     5     0

q=Cancel  f=PageDn  b=PageUp

```

Figure 164. Example Confirm Rebuild Disk Unit Data display

- To confirm that you want to rebuild the data on the disk drive, press Enter. The message that the rebuild has begun is shown at the bottom of the Work with Disk Unit Recovery display. The rebuild process might take several minutes to complete.

Rebuild data on a disk drive using Linux kernel 2.6

Learn the steps to rebuild your data on a disk drive.

If a hot-spare disk drive was available and protected the disk array throughout the disk drive failure, you can configure the newly installed disk drive as a hot spare. For instructions, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

This guide is available from the SCSI PCI Adapters Web page at http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm.

If a hot-spare rebuild was not initiated by the controller, you need to initiate a rebuild on the newly installed disk drive. To initiate the rebuild, follow these steps:

- Log in as root user.
- Type `iprconfig` on the command line of the Linux session and press Enter. The IBM Power RAID Configuration Utility display is shown.
- Select **Work with disk unit recovery** from the IBM Power RAID Configuration Utility display. Press Enter. The Work with Disk Unit Recovery display is shown.
- From the Work with Disk Unit Recovery display, select **Rebuild disk unit data**. A Rebuild Disk Unit Data display similar to the following is shown.

```

Rebuild Disk Unit Data

Select the disks to be rebuilt

Type choice, press Enter.
  1=Rebuild

OPT Name  PCI/SCSI Location      Description      Status
-----
  1        0000:58:01.0.0/0:4:0    RAID Array Member  Failed

e=Exit  q=Cancel  t=Toggle

```

Figure 165. Example Rebuild Disk Unit Data display

5. Type option 1 (Rebuild) next to the disk drive you want to rebuild and press Enter.

Note: Performing a rebuild on a disk drive overwrites the data currently on the disk drive. A Confirm Rebuild Disk Unit Data display similar to the following is shown.

```

Confirm Rebuild Disk Unit Data

Rebuilding the disk unit data might take several minutes for each disk
selected.

Press Enter to confirm having the data rebuilt.
  q=Cancel to return and change your choice.

OPT Name  PCI/SCSI Location      Description      Status
-----
  1        0000:58:01.0.0/0:4:0    RAID Array Member  Failed

q=Cancel  t=Toggle

```

Figure 166. Example Confirm Rebuild Disk Unit Data display

6. To confirm that you want to rebuild the data on the disk drive, press Enter.

The message that the rebuild has begun is shown at the bottom of the Work with Disk Unit Recovery display. The rebuild process might take several minutes to complete.

Related procedures

Locate instructions to complete some of the additional procedures you might need. These procedures might include removing covers and doors, starting and stopping the system, placing a system or server in the service position, identifying a failing part, or verifying a replaced part.

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

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.

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

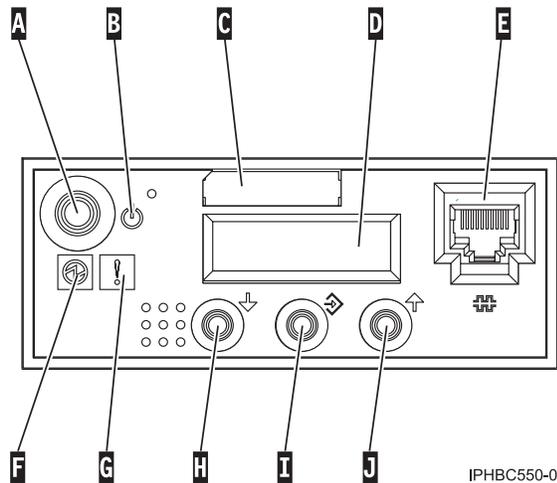
You might need to start a system or logical partition. You can use this procedure to start the system or logical partition.

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:

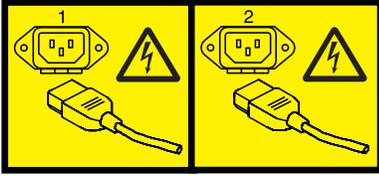
1. Log in to the system as a user with the authority to run the shutdown or pwrdownsys (Power Down System) command.
2. At the command line, enter one of the following commands:
 - If your system is running AIX, type **shutdown**.
 - If your system is running i5/OS, type **pwrdownsys *immed**.
 - If your 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

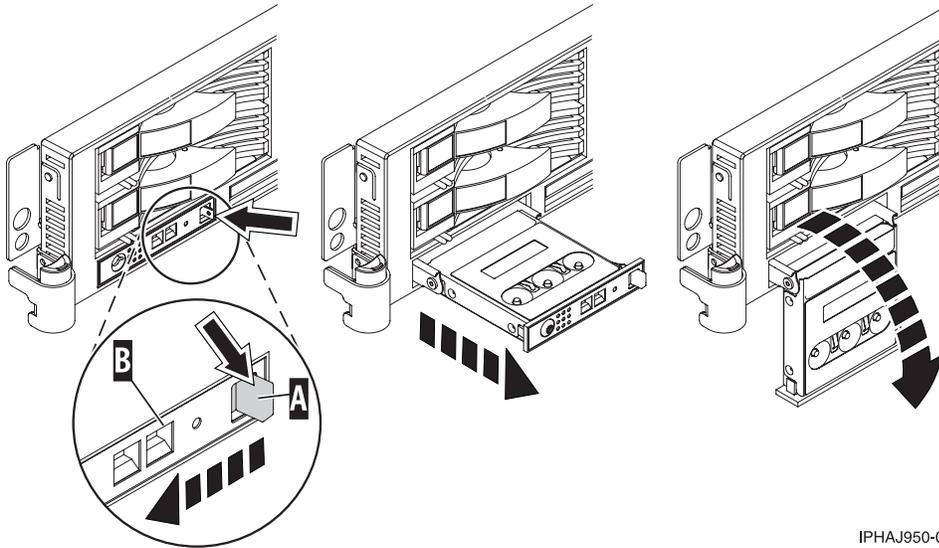
Gain access to the model 51x and OpenPower 710 control panels

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:

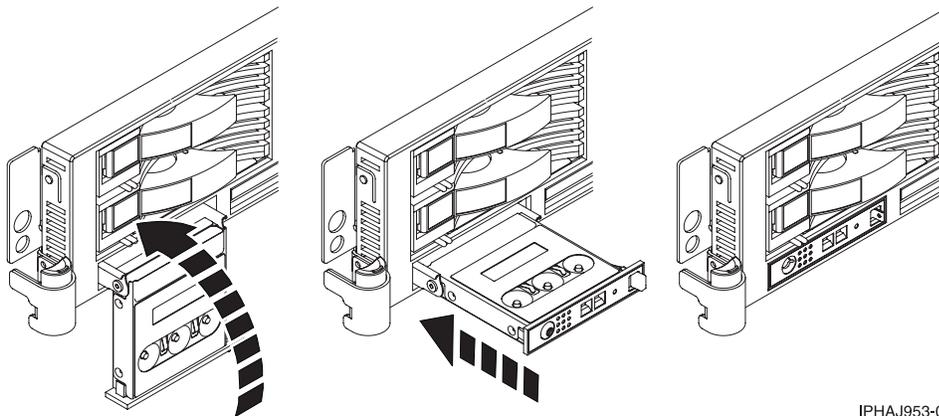
1. Press inward on the spring-loaded tab **A** located on the right side of the control panel **B** so that it pops out slightly, as shown in the following figure.



IPHAJ950-0

Figure 167. 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 168. Close the control panels

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.

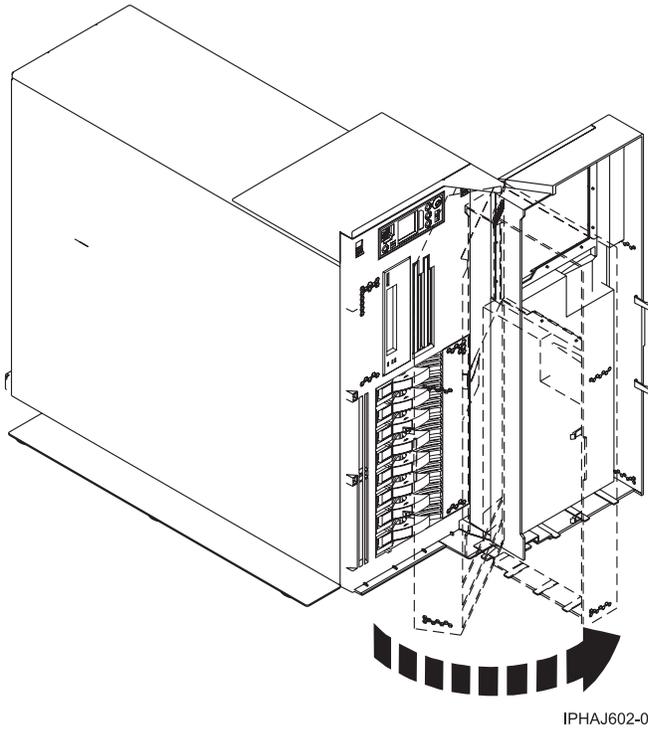
Remove the door from the model 285, 52x, 55x, or OpenPower 720

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

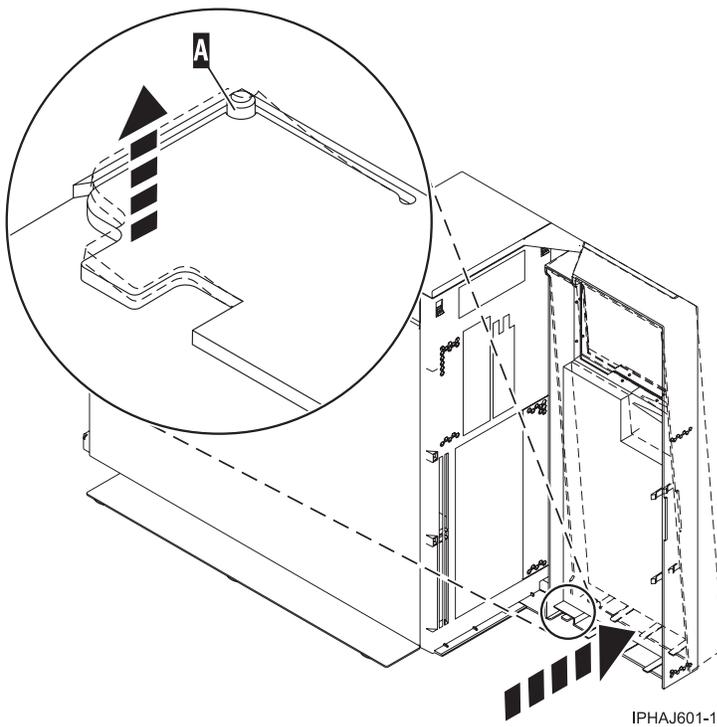
To remove the door from the model 285 or 9131-52A see, “Remove the door from the model 285 or 9131-52A” on page 172.

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 door 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.

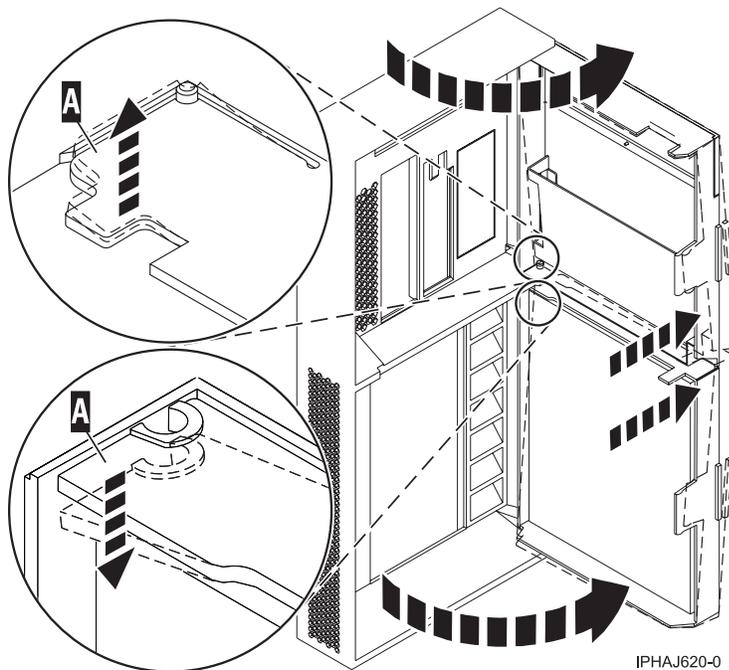


Figure 169. Removing the model 285 or 9131-52A door

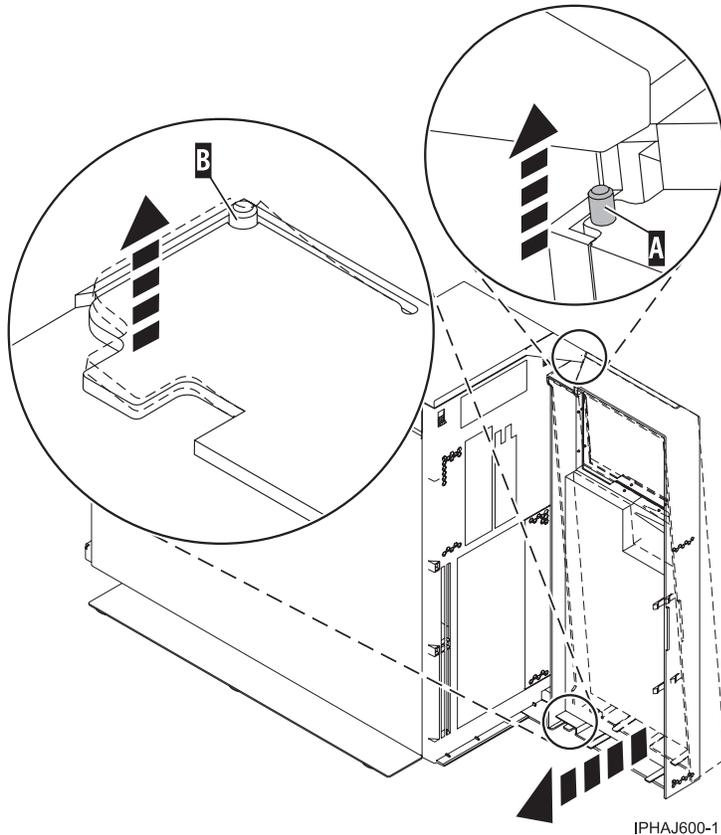
Install or replace the door on the model 285, 52x, 55x, or OpenPower 720

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 174

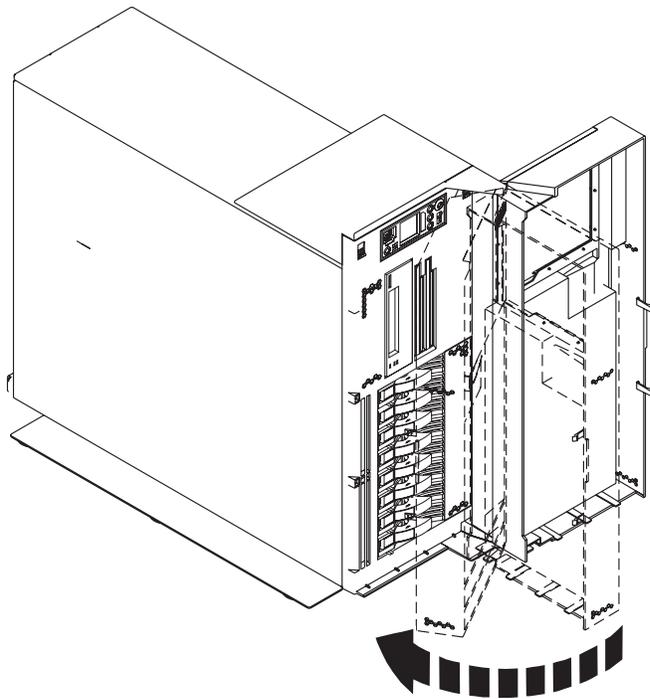
To install the model 52x, 55x, or OpenPower 720 front door, do the following:

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.



IPHAJ600-1

4. Close the door.



IPHAJ603-0

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.

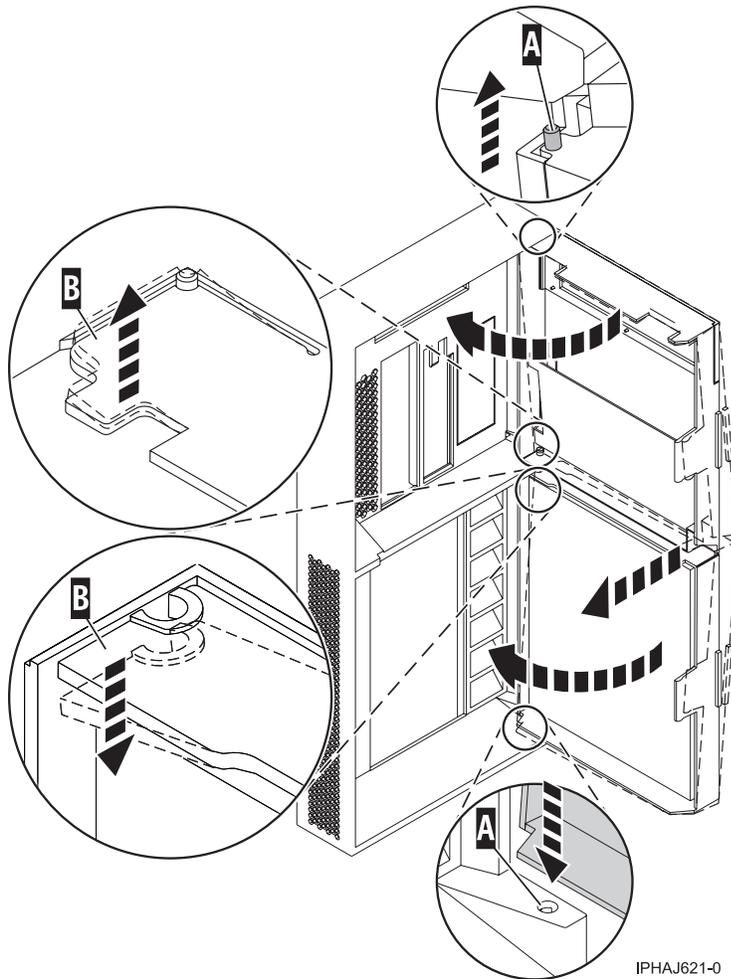


Figure 170. Installing the model 285 door

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.

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.

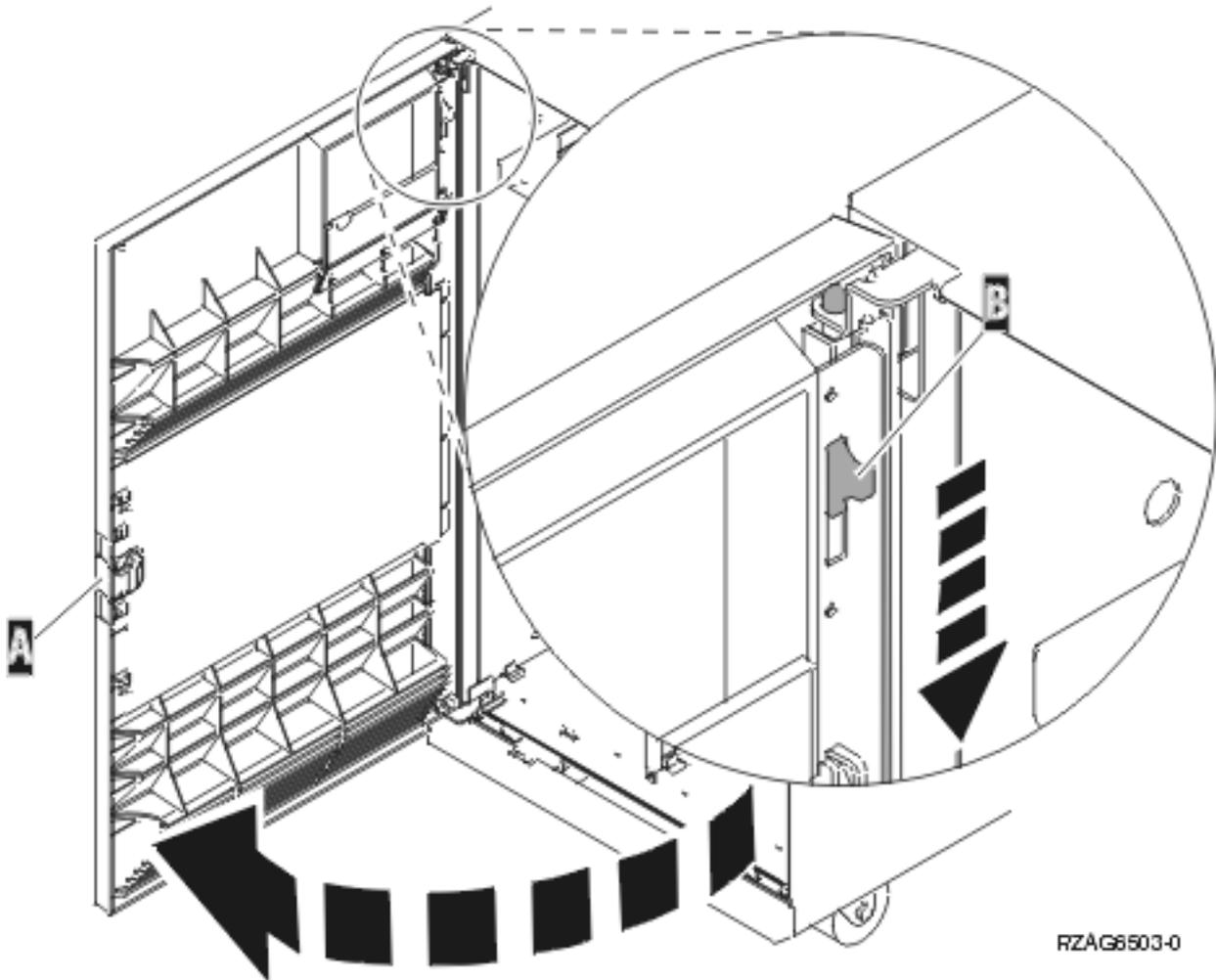


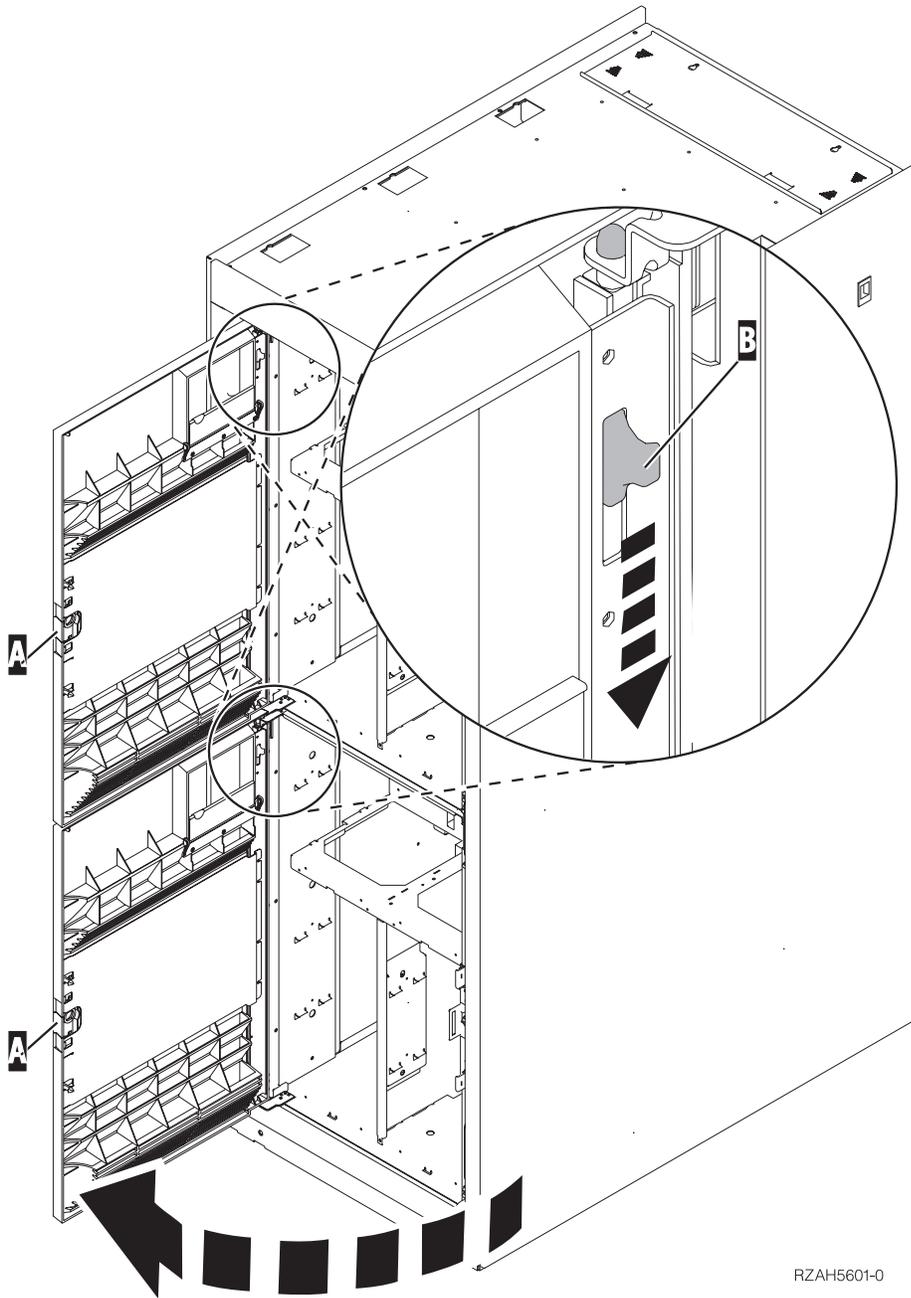
Figure 171. Removing the expansion unit front door

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 172. 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.

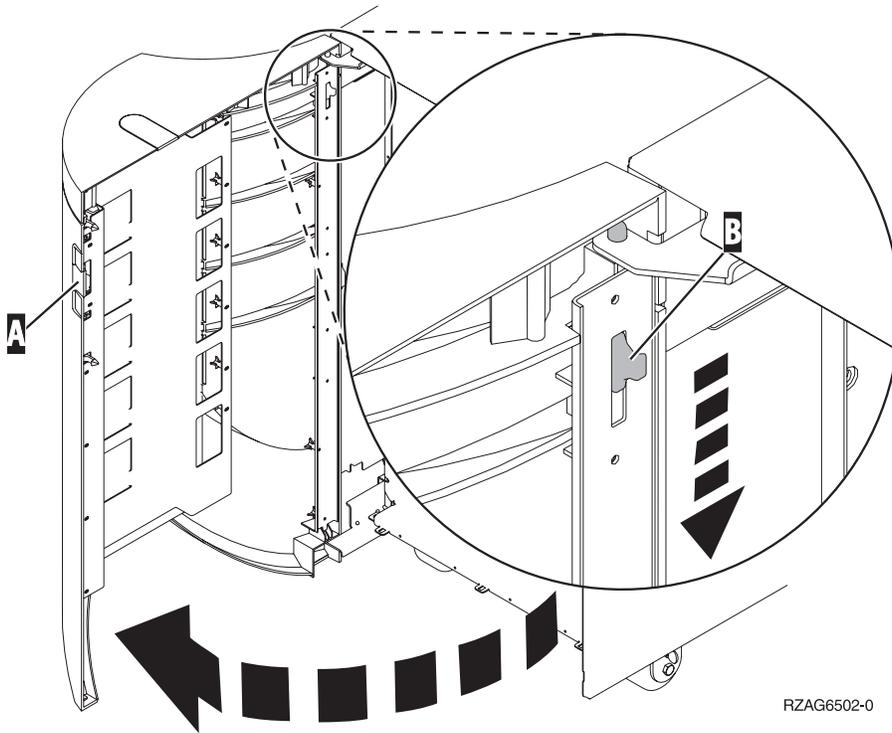
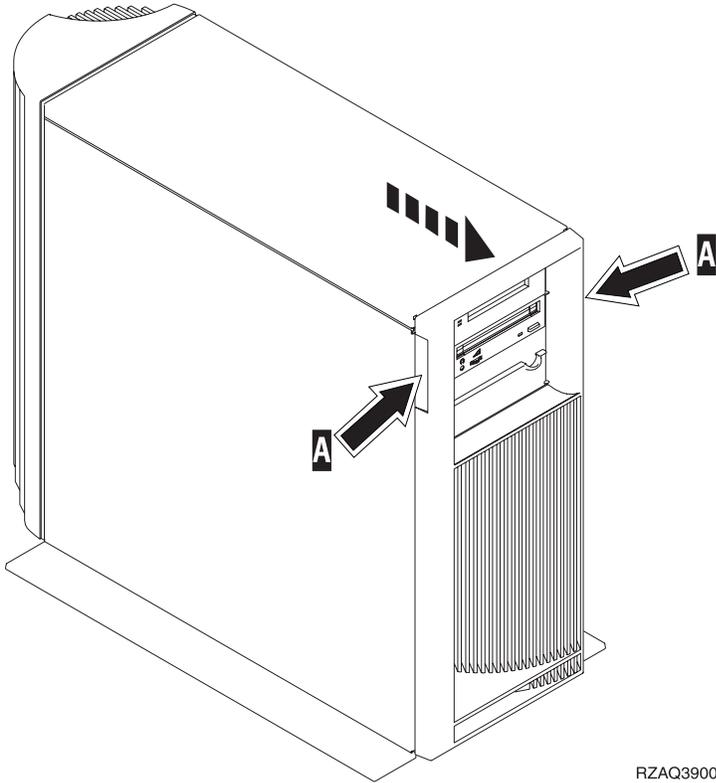


Figure 173. Removing the expansion unit back door

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.



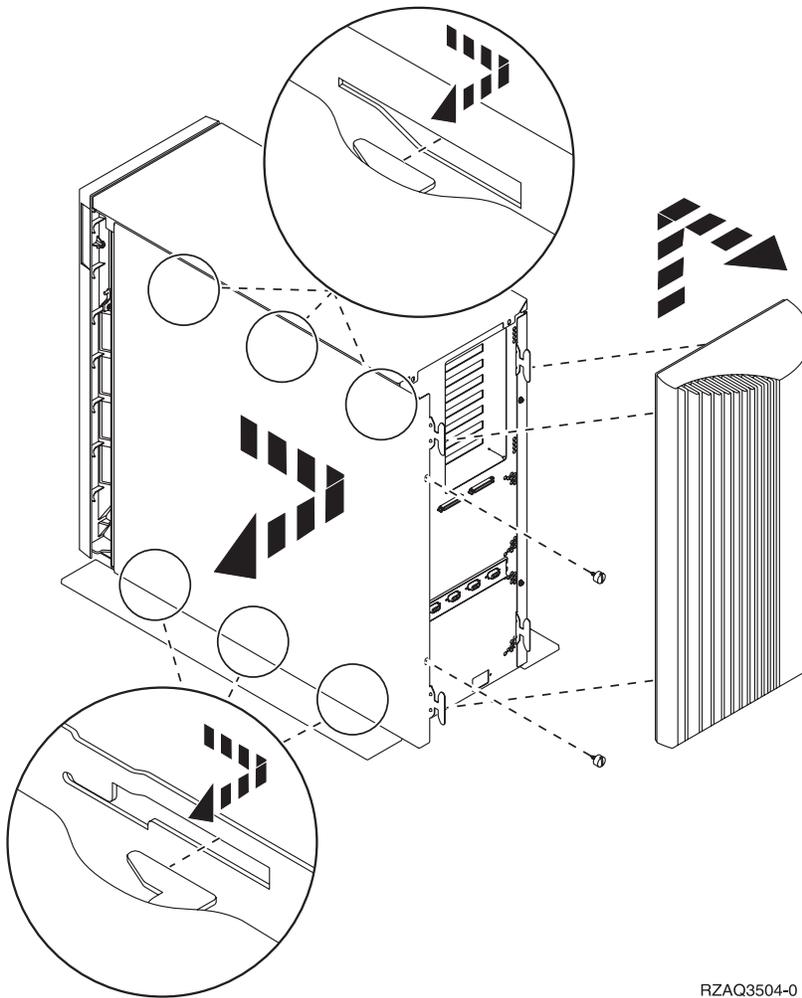
RZAQ3900-0

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.



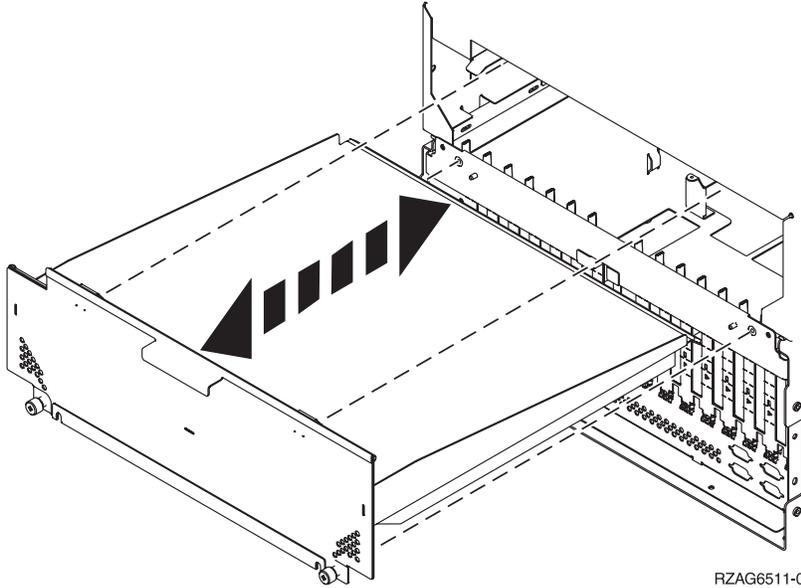
RZAQ3504-0

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.

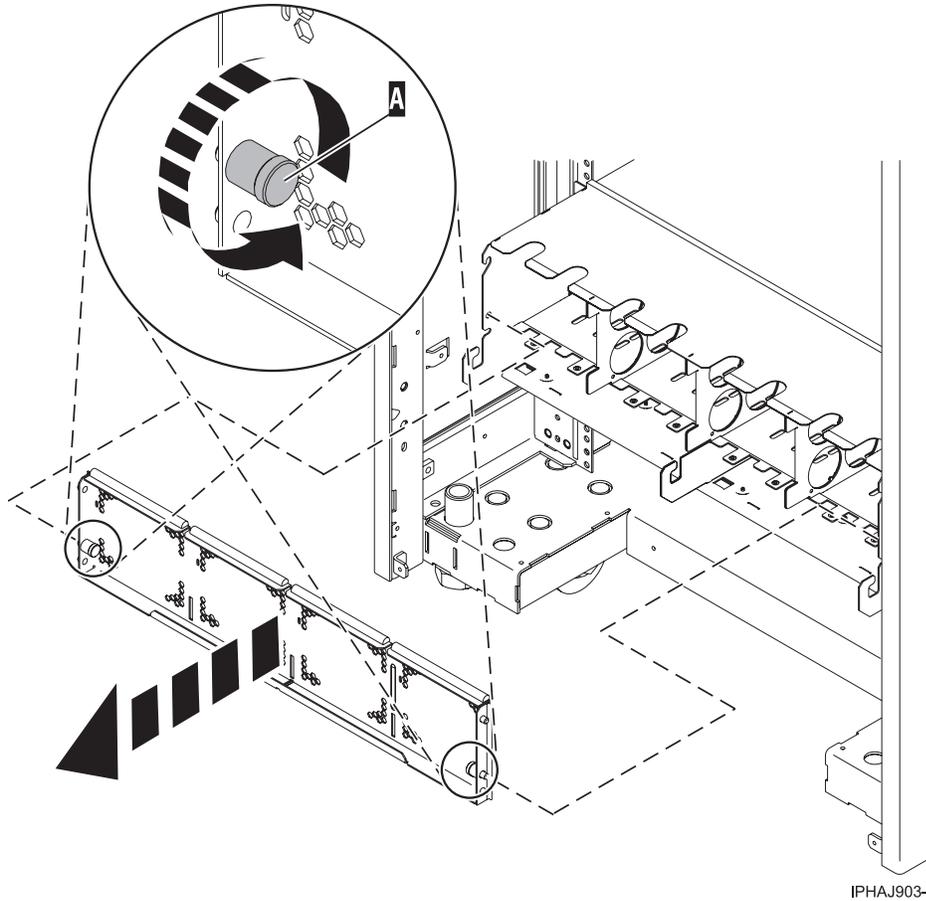
Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit:

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:



IPHAJ903-0

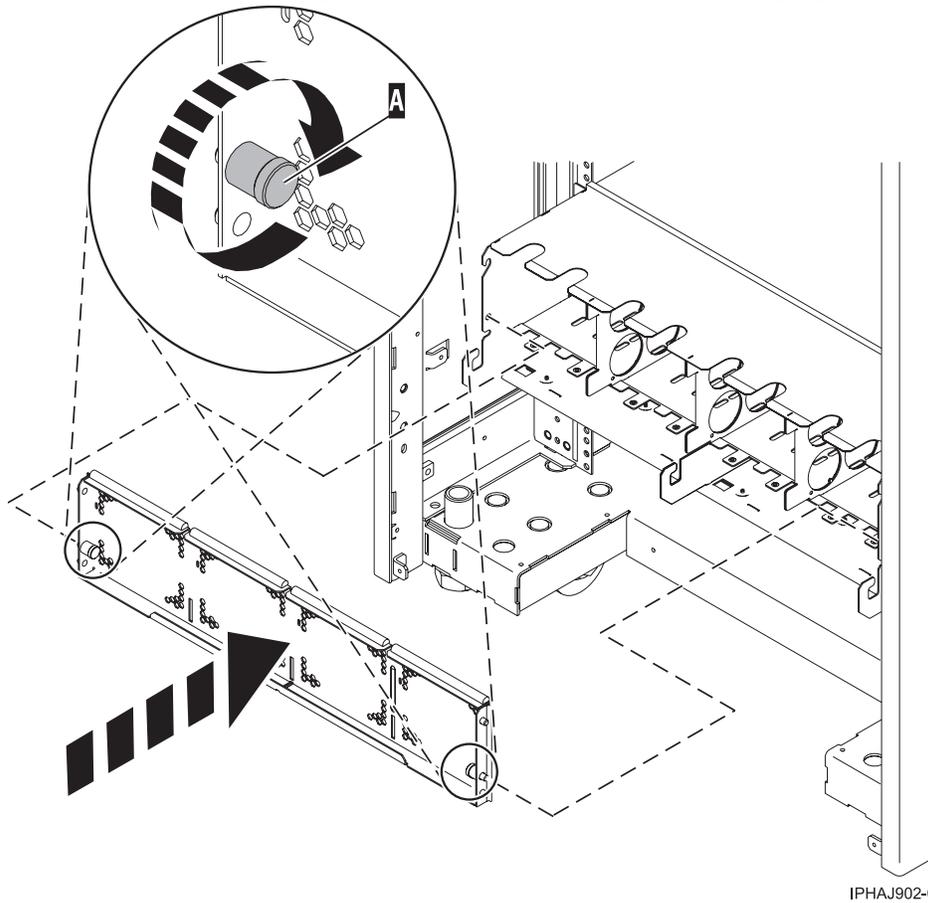
3. Pull the cover out and away from the expansion unit.

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.

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:

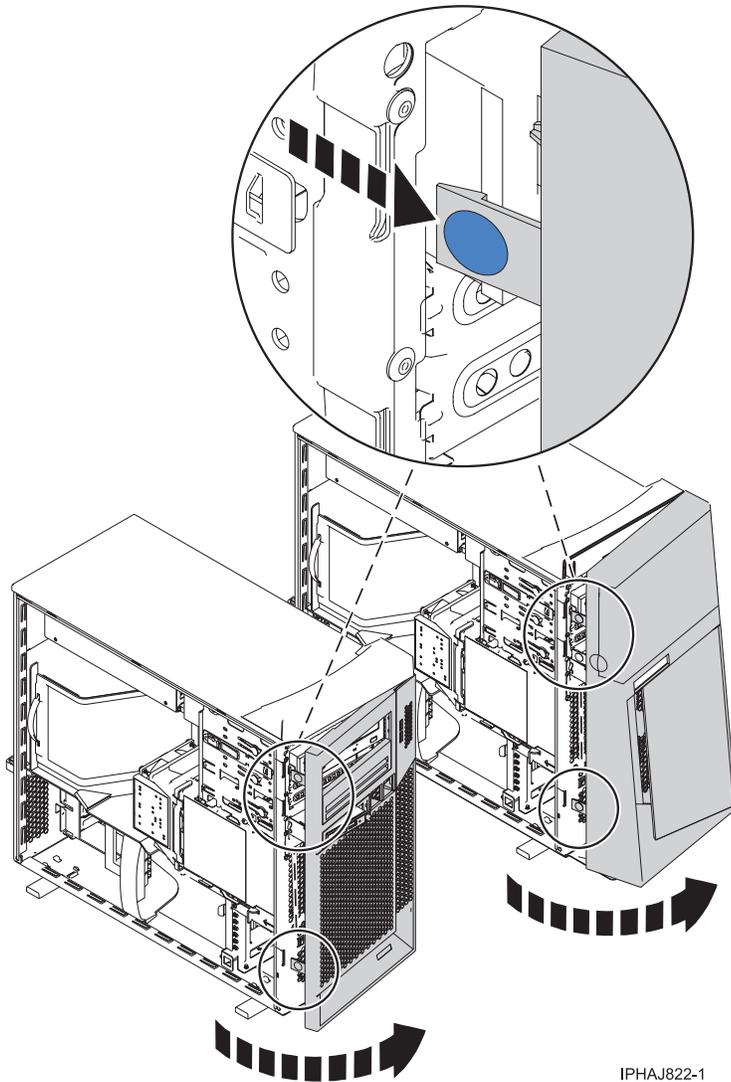
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

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 186
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 174. Removing the front cover

Remove and replace the model 7047-185 or 7037-A50 acoustic-feature back cover:

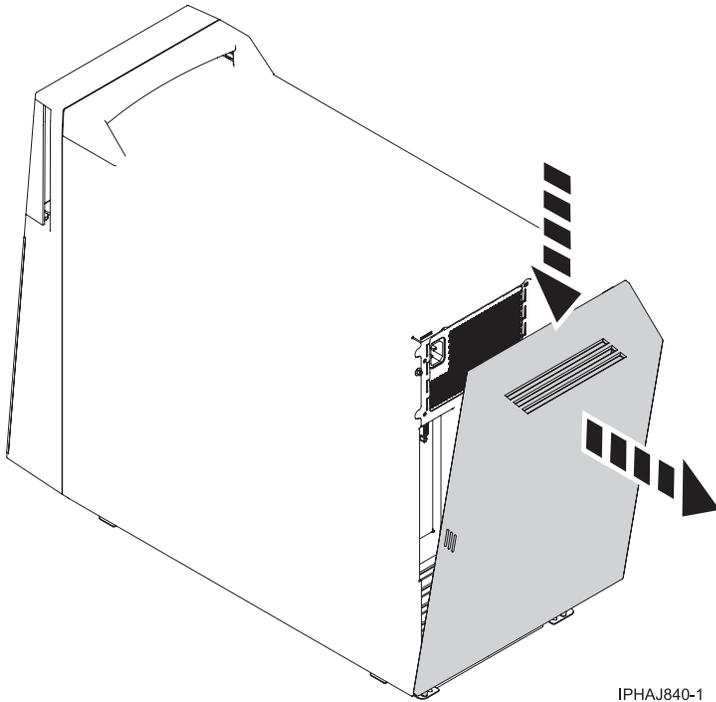
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

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 175. 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.

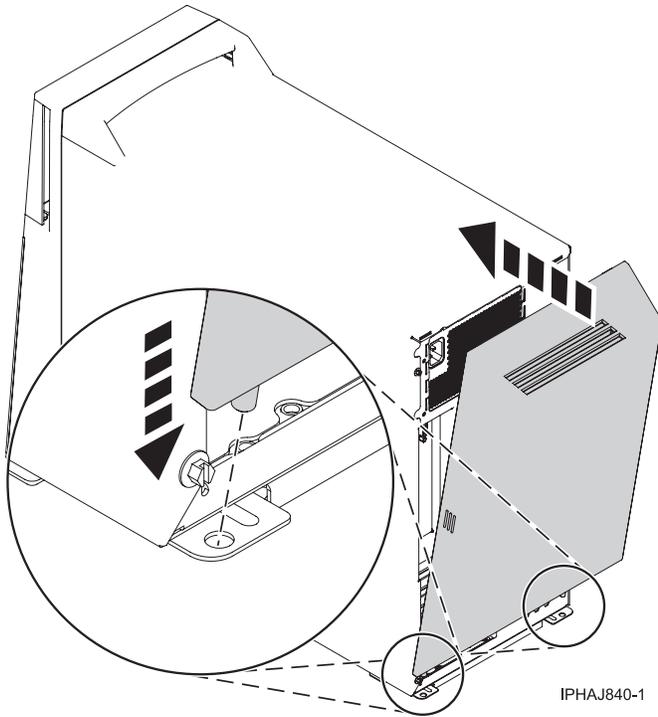


Figure 176. Replacing the back cover

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.

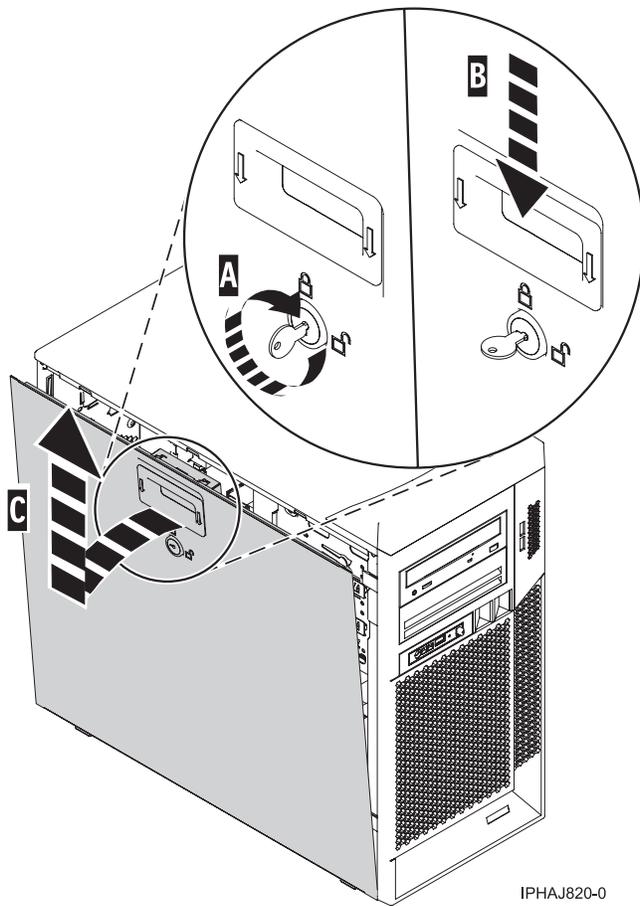


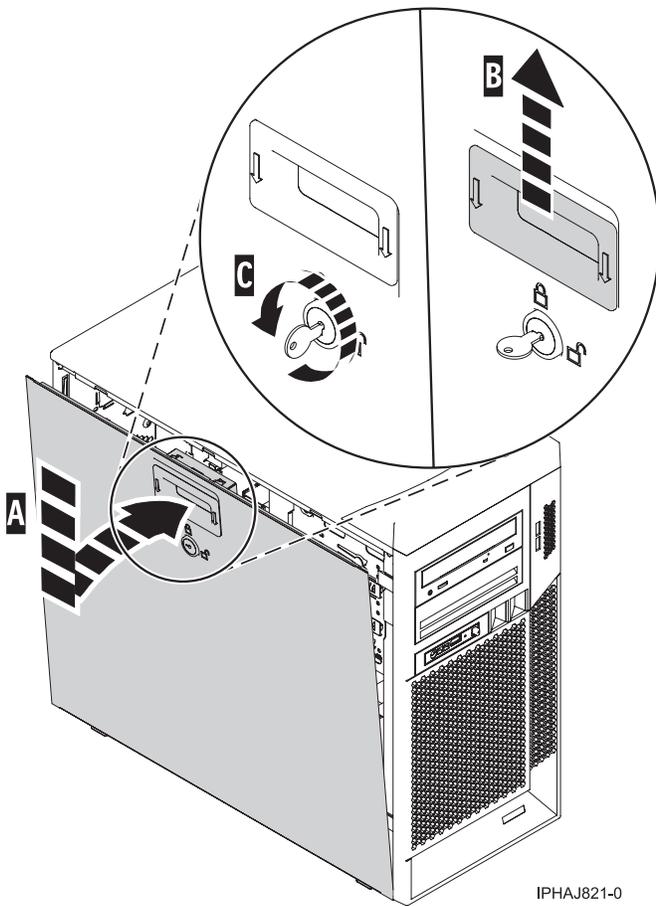
Figure 177. Removing the side cover

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 178. Replacing the service panel

3. Lock the security lock C if needed.

Front cover

You might need to remove, replace, or install covers to access components or perform service. Use the instructions in this section to accomplish these tasks.

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.

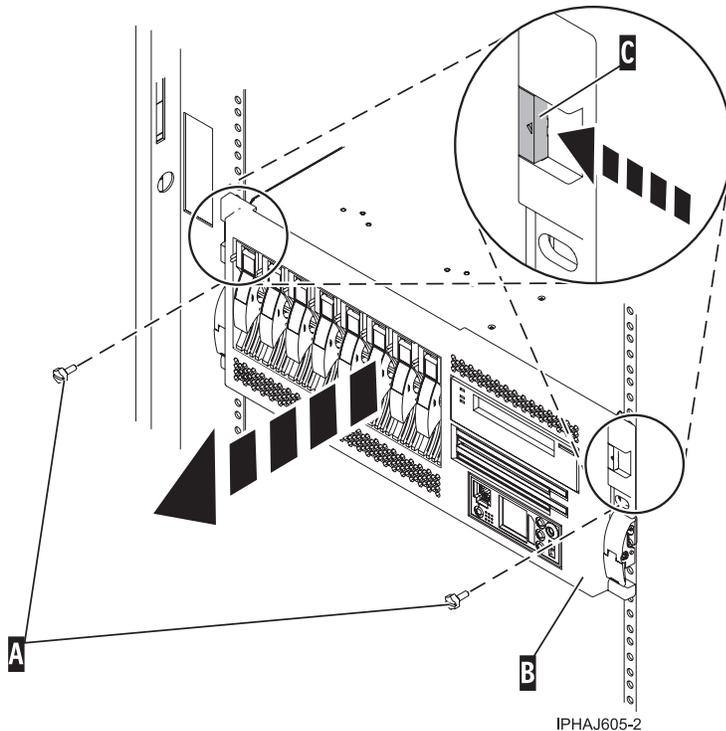
Remove the front cover from the rack-mounted model 285, 52x, 55x, or OpenPower 720 and the 0595 expansion unit:

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:

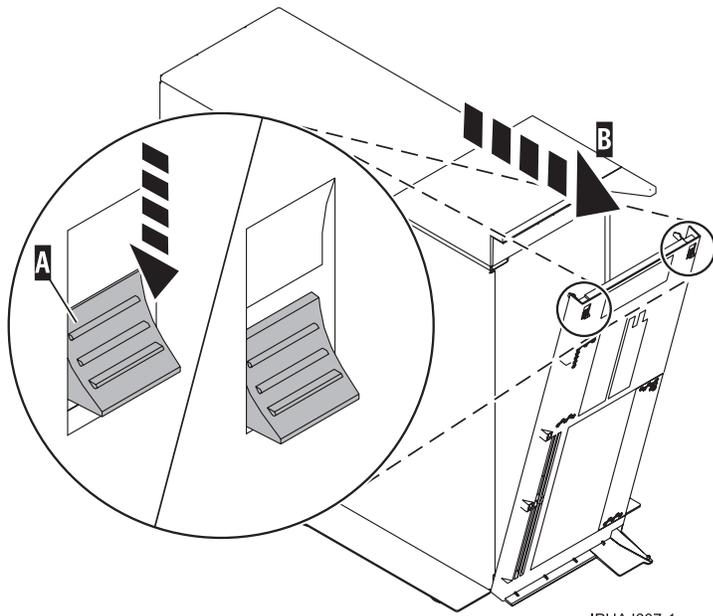
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

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 171.

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:

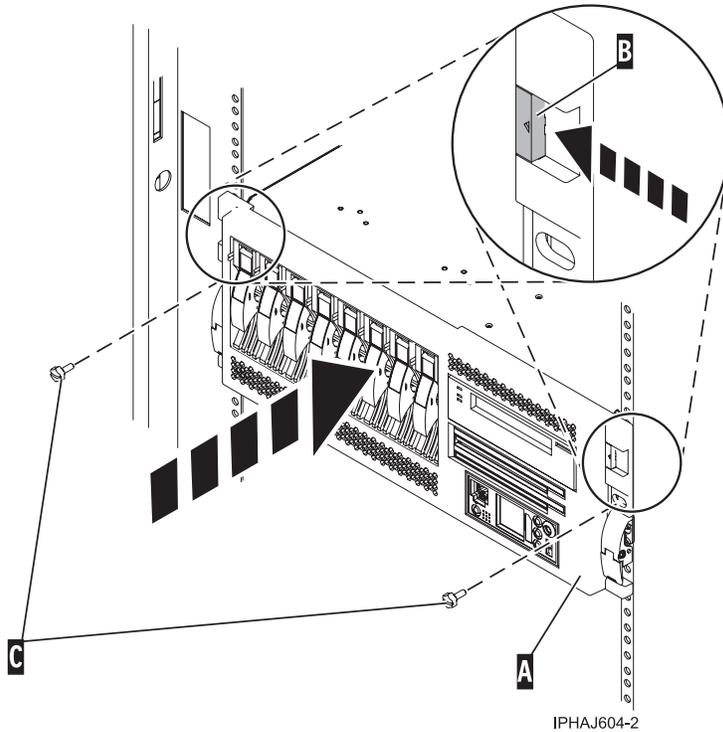
You might need to install the cover after accessing components or performing service. Use the procedures in this section to accomplish this task.

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.



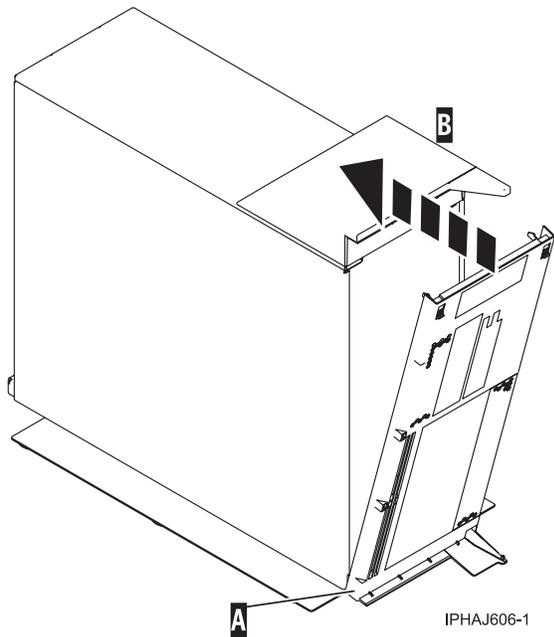
3. Tighten the thumbscrews.
4. Close the front rack door.

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 173.

Front cover for the model 9116-561 or 570

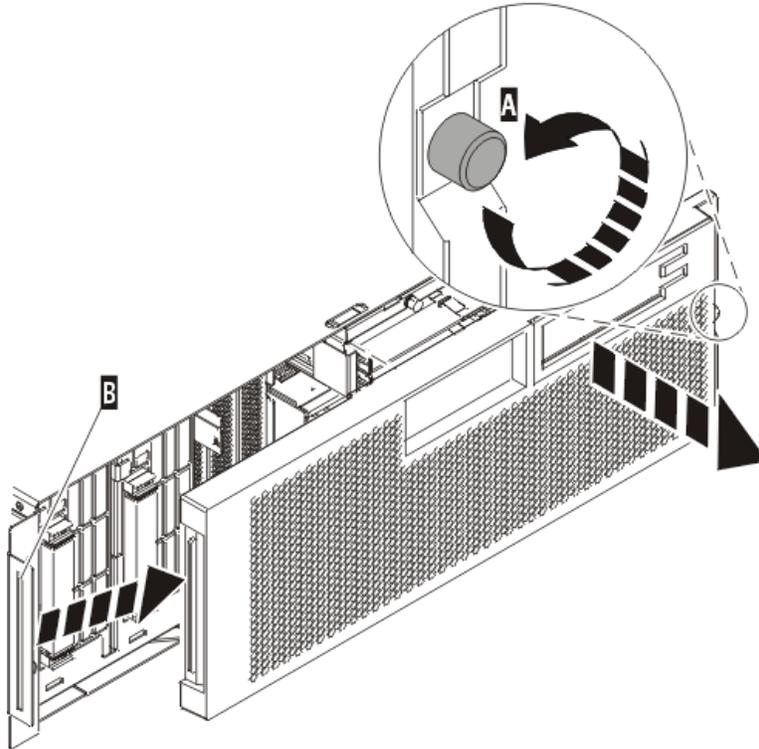
You might need to remove and replace the cover to access components or perform service. Use the procedures in this section to accomplish these tasks.

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

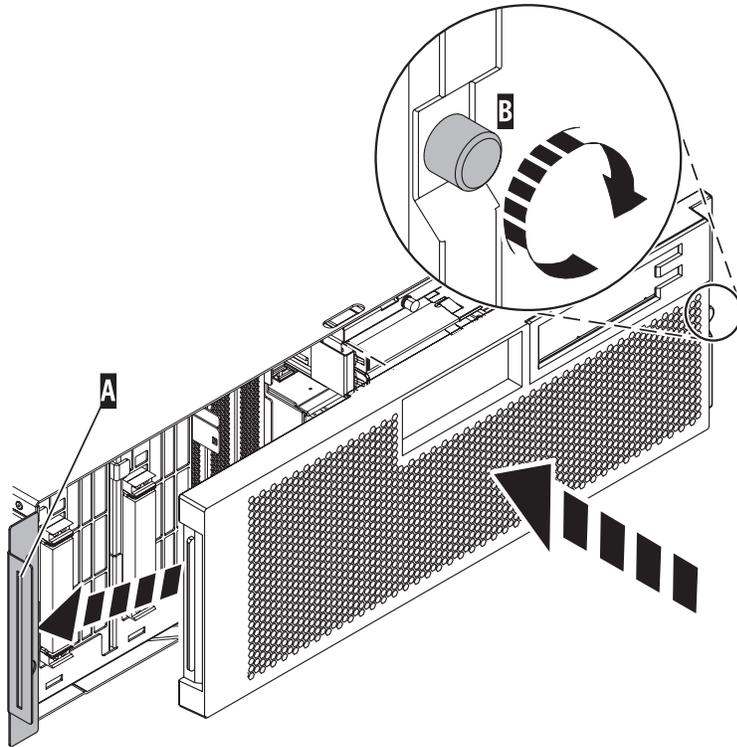
3. Slide the cover to the right and remove it from the system unit.

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

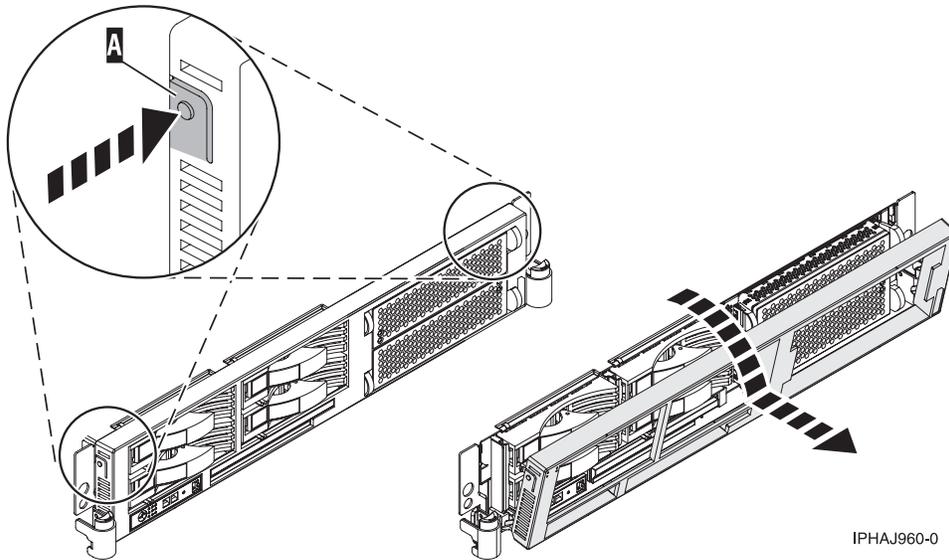
2. Tighten the thumbscrew on the right side of the cover.
3. Close the front rack door.

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.



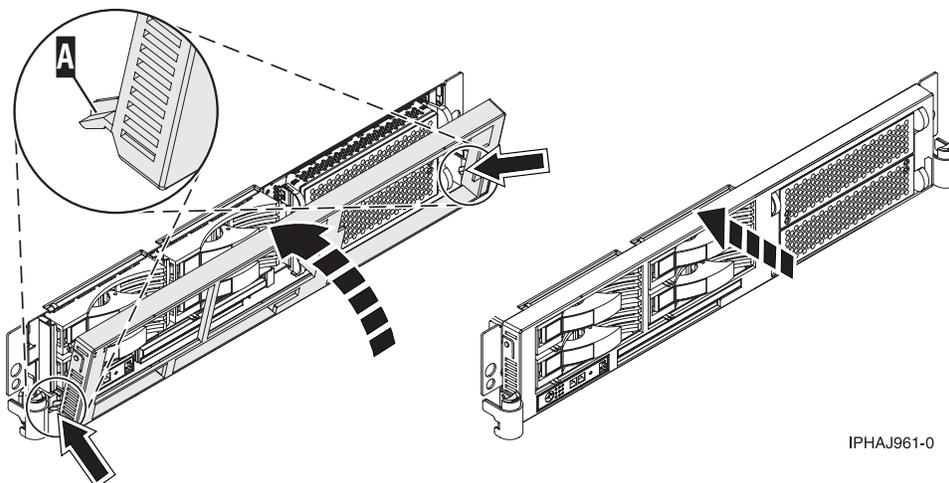
3. Pivot the cover from the bottom and swing the top of the cover out.
4. Pull the bottom of the cover up and then away from the system unit. This releases the two tabs located on the bottom of the cover.
5. Put the cover in a safe place.

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.



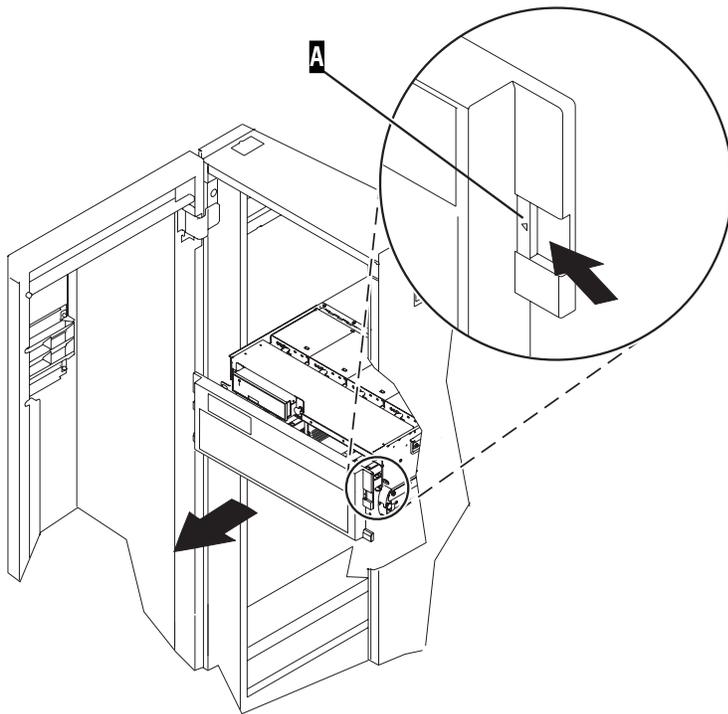
3. Pivot the front cover up toward the top of the system unit frame.
4. Align the tabs to the matching slots located on the front of the system unit frame.
5. Gently push the tabs into the slots until the cover seats against the front of the system unit.
6. Close the front rack door.

Remove the front cover from the 7311-D20 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 expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Remove the thumbs screws that are securing the covers to the rack.
3. Push both cover-release latches in the direction of the arrows to release the cover as shown in the following figure.



4. Pivot the cover from the bottom and swing the top of the cover out.
5. Pull the bottom of the cover up and then away from the expansion unit. This releases the two tabs located on the bottom of the cover.
6. Put the cover in a safe place.

Install the front cover on the 7311-D20 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 expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Insert the two tabs located on the bottom edge of the cover into their locking slots, located on the expansion unit frame.
3. Pivot the front cover up toward the top of the expansion unit frame.
4. Align the tabs to the matching slots located on the front of the expansion unit frame.
5. Gently push the tabs into the slots until the cover seats against the front of the expansion unit.

6. Install the thumbs screws to secure the covers to the rack.
7. Close the front rack door.

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.

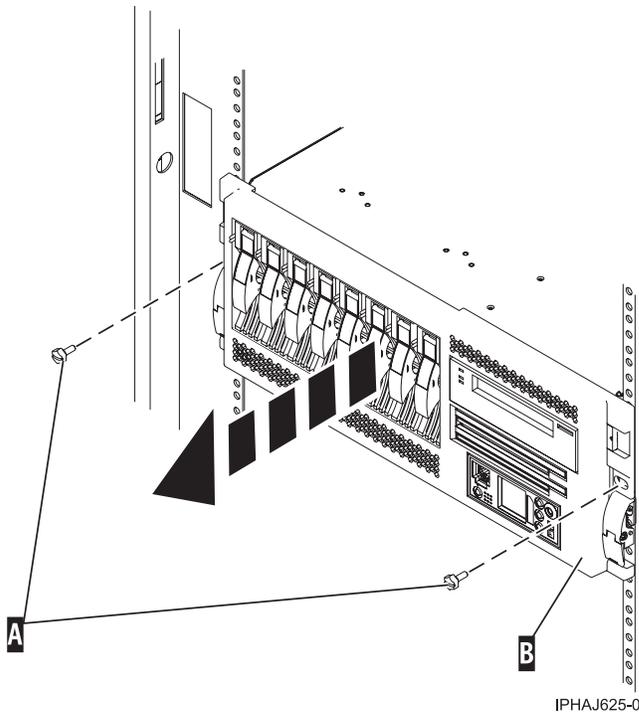
CAUTION

- 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.

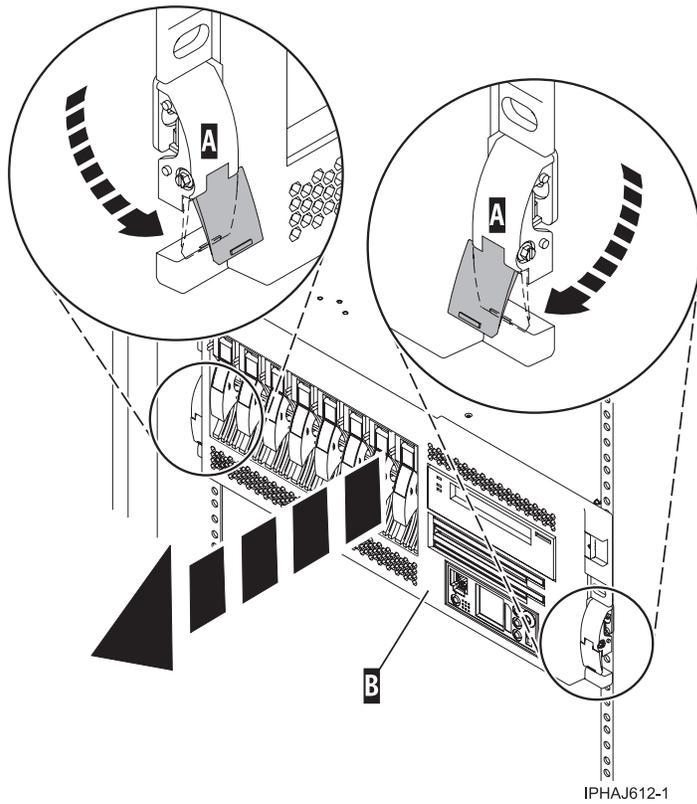
(R001)

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

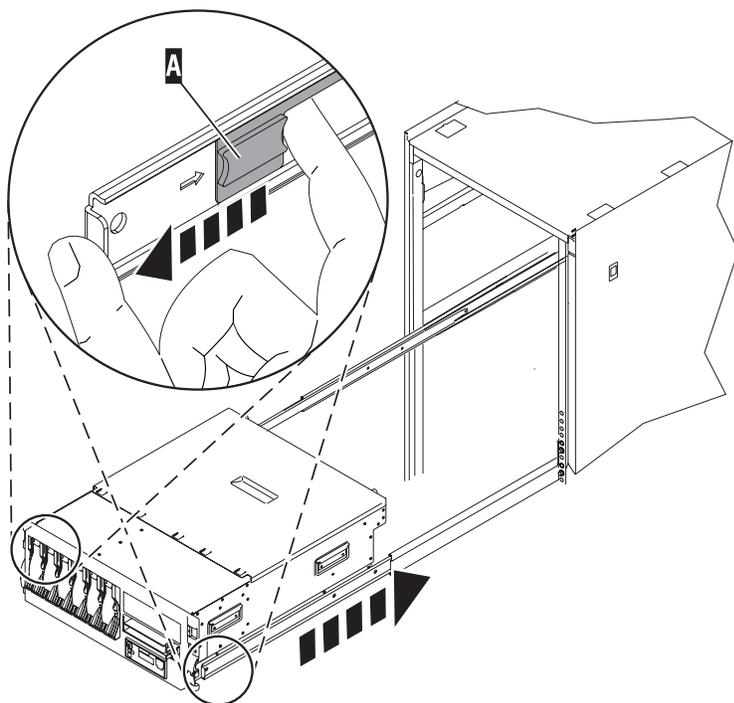
You might need to place the rack-mounted system or expansion unit in the operating position to make the unit available for use. Use the instructions in this section to accomplish this task.

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:

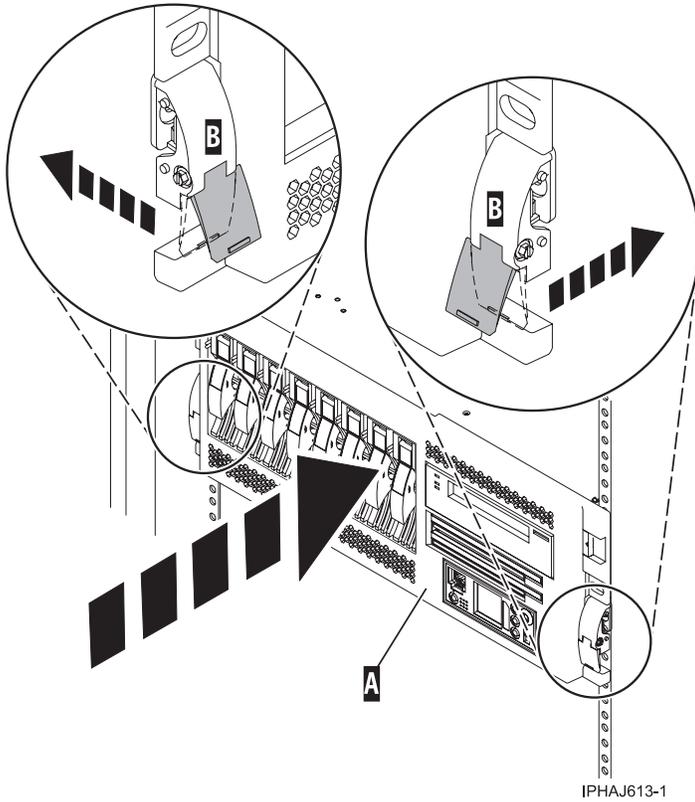
1. Simultaneously release the blue rail safety latches **A**, located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

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.

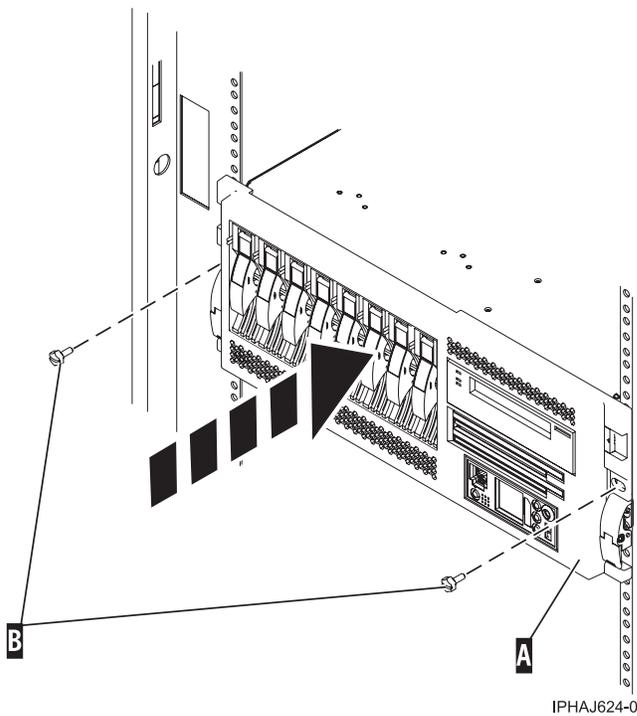


IPHBF509-1

- 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.

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 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.

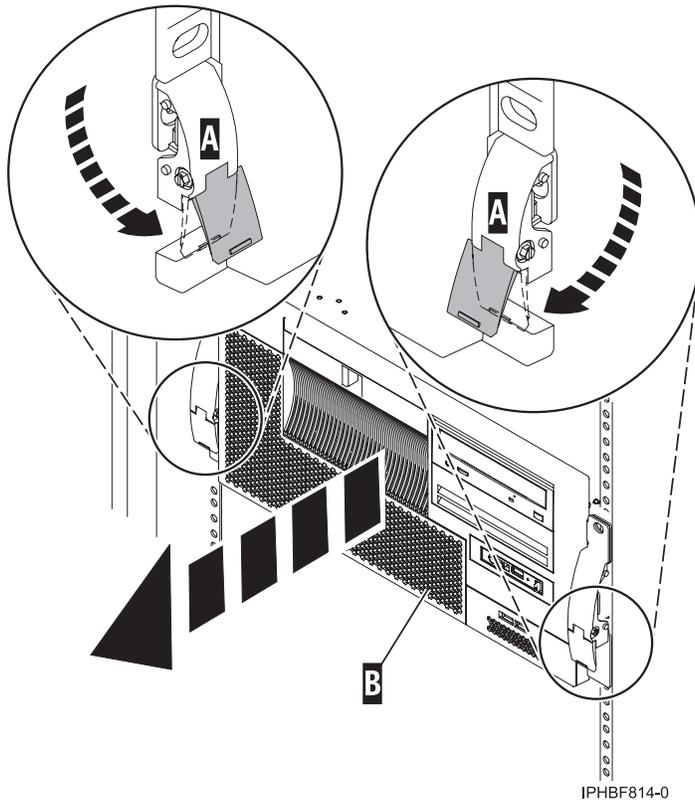


Figure 179. Placing the model in the service position

Place the rack-mounted model 7047-185 or 7037-A50 in the operating position

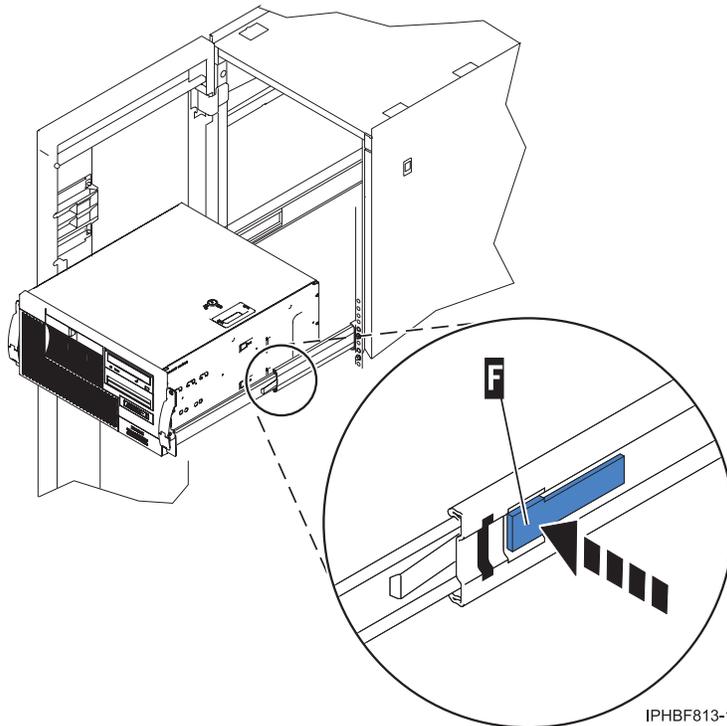
You might need to place a system into the operating position to make the system available for use. Use the procedure in this section to perform this task.

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.

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.

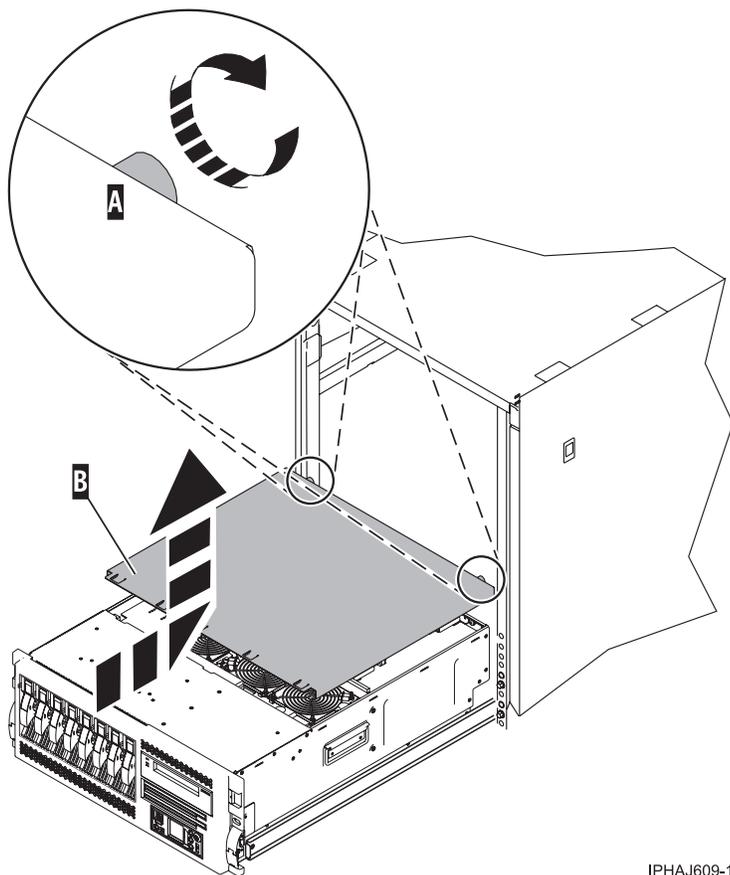
Remove the service access cover from the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:

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 197.
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 180. Remove the service access cover

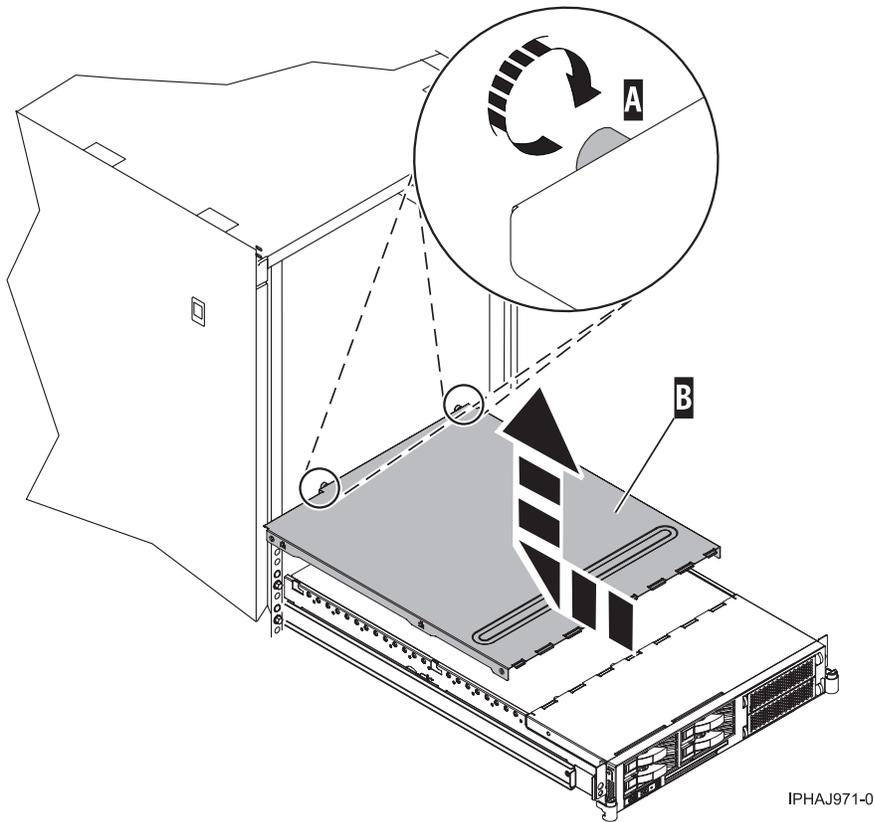


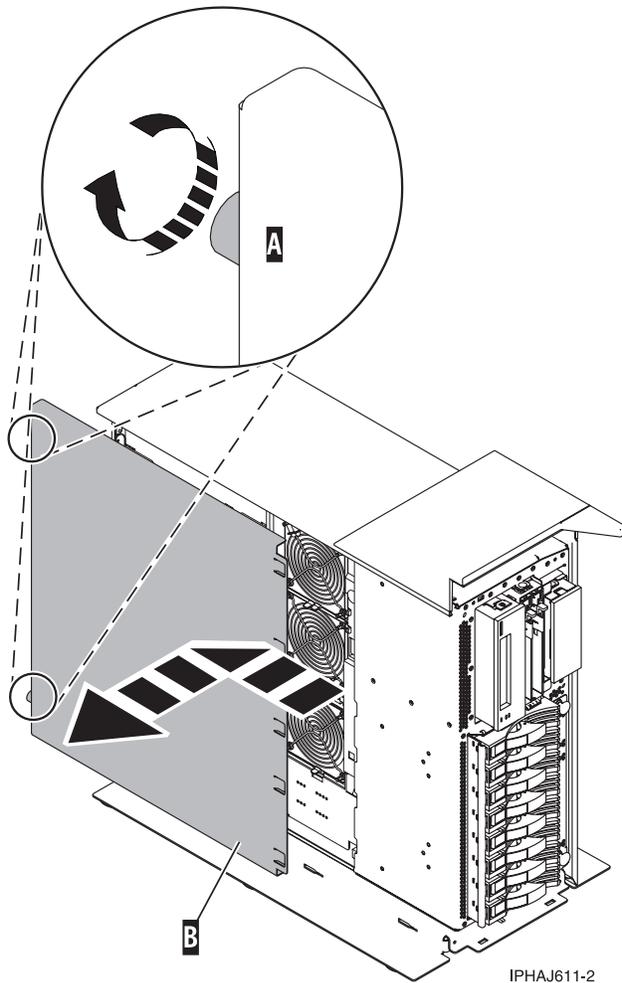
Figure 181. Remove the service access cover

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 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.

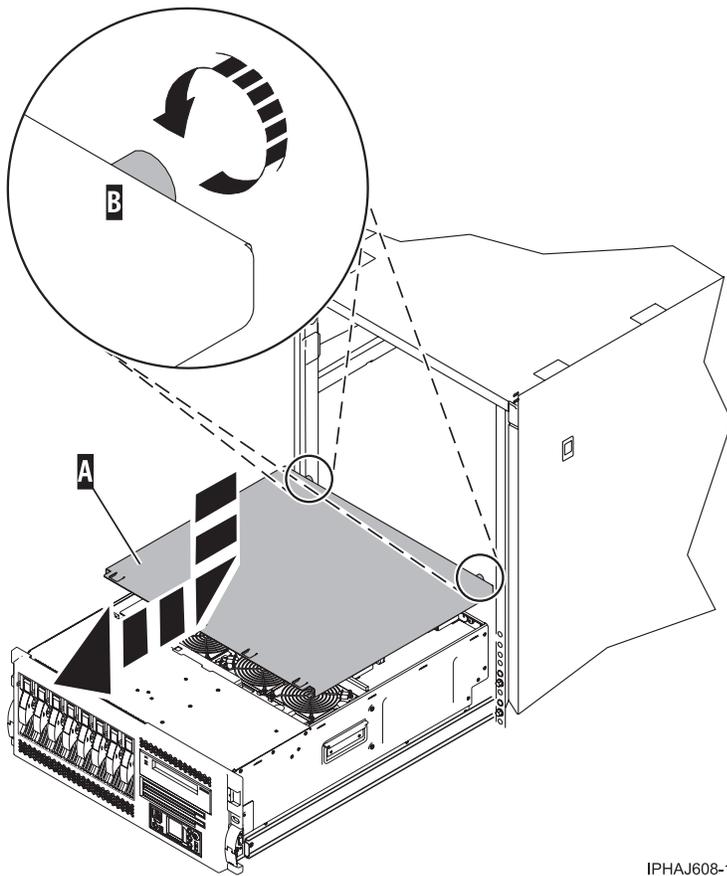
Install the service access cover on the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:

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 182 on page 209 and Figure 183 on page 210, and follow these steps:

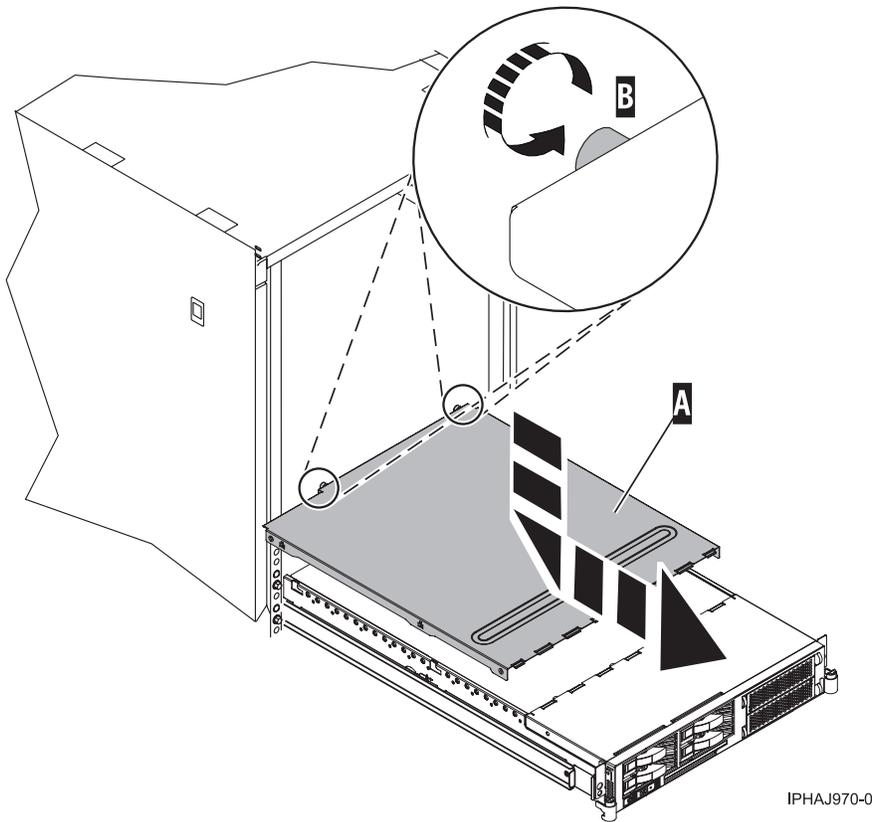
- Place the service access cover **A** on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
- Hold the service access cover against the system unit, and slide it toward the front of the system. Ensure that the fan LED cables do not get caught on the front edge 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.



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Figure 182. Install the service access cover on the rack-mounted model



IPHAJ970-0

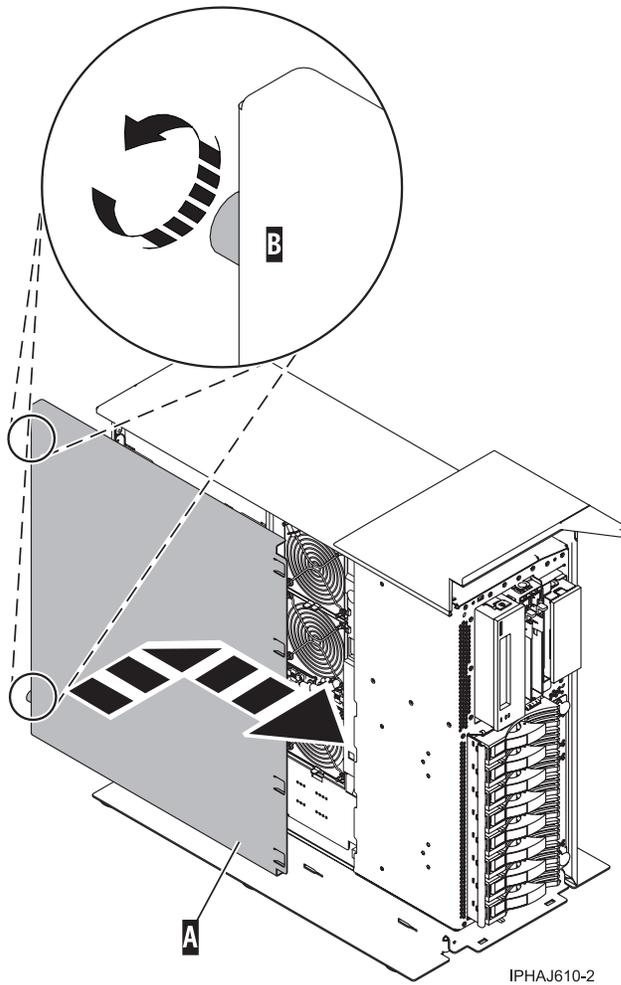
Figure 183. Install the service access cover on the rack-mounted model

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.



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 212
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” on page 213.

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**.

- 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.

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 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:

- 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 202.
- "Remove and replace the model 7047-185 or 7037-A50 side cover" on page 186.
- 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.

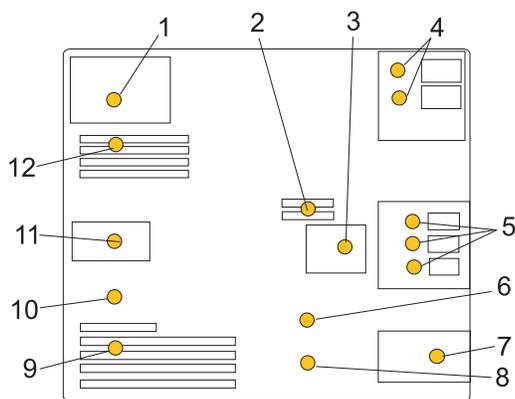


Figure 184. Light path diagnostic card indicator LED layout

Table 1. 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

Table 1. Fault-indicator LEDs (continued)

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

4. Refer to the service label on your system or the following figure to locate an LED on the system backplane for replaceable parts.

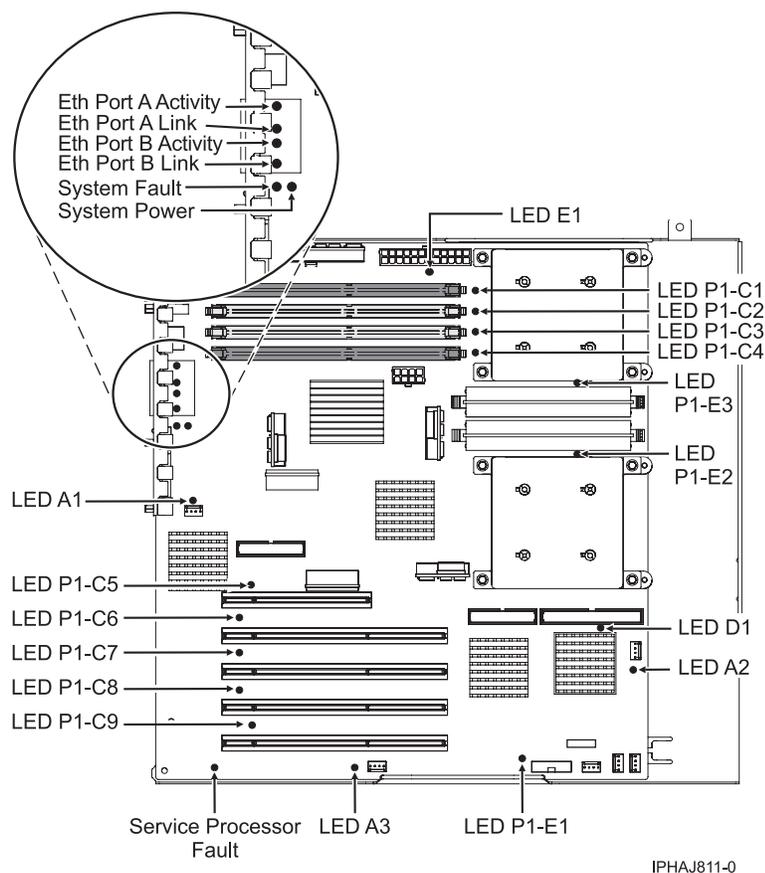


Figure 185. System backplane indicator LED layout

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.
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.

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 on page 221.
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

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
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 reseat 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 217.
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.

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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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

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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.

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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.

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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.

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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
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Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

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- 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.

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IBM Taiwan Product Service Contact Information

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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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