

Disk Drives

ESCALA



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ESCALA

Disk Drives

Hardware

November 2008

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Safety 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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

Chapter 1. Disk drives

You might need to install, or remove and replace a disk drive. Use the following instructions to complete these tasks.

Related concepts

“Disk drive backplane” on page 82

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

Related tasks

“Internal DASD sharing on model 04E/8A, 03E/4A” on page 93

You might need to cable and understand the function of this feature. Use the following information to complete these tasks.

“Installing the external SAS port on a model 03E/4A, , or ” on page 96

You might need to install an external SAS port as a part of upgrading your disk-drive backplane, or enabling internal disk drive sharing. Use the procedure in this section to perform this task.

“Installing the external SAS port on a model 04E/8A or ” on page 97

You might need to install an external SAS port as a part of upgrading your disk-drive backplane, or to enable internal disk sharing. Use the procedure in this section to perform this task.

Disk drive

You might need to install, remove, or replace a disk drive, a disk-drive backplane, or an 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.

Install a disk drive

You might need to install a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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) or Serial Attached SCSI (SAS) 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.

About 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 provided power cord. Do not use the 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.

(D005a)

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 17.

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 101.
2. Remove the system unit door, remove the expansion unit door, or open the rack. For instructions, select the appropriate procedure:
 - “Removing and replacing expansion unit cover or door” on page 125
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:

- “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
4. Determine the next available disk drive position in your system or expansion unit. For information, see “Disk drive locations” on page 58.

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:

About this task

1. Log in as root user.
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.

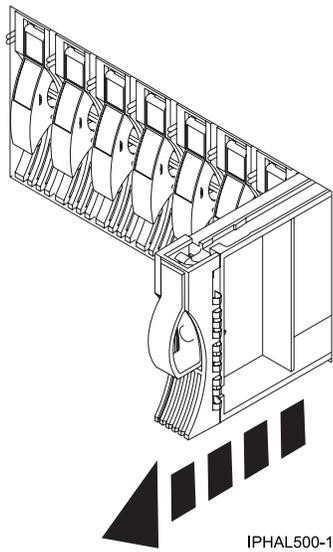
The disk drive slot enters the Identify state. The concurrent maintenance light for the slot begins flashing. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:

- “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
 - “Disk-drive concurrent maintenance lights for models ” on page 76
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 1 on page 4

Attention:

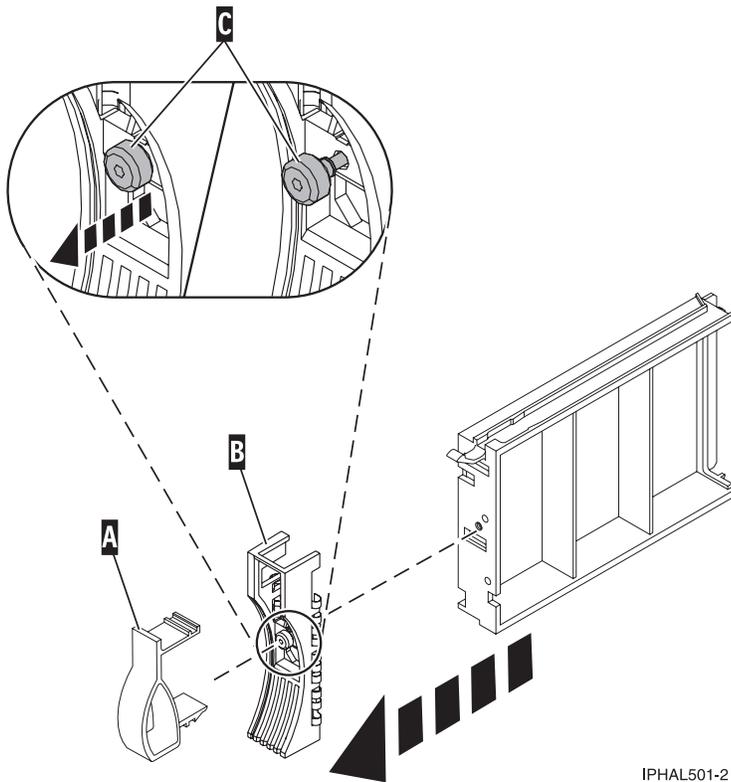
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving 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.



IPHAL500-1

Figure 1. Removing a disk-drive filler from a model .

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.

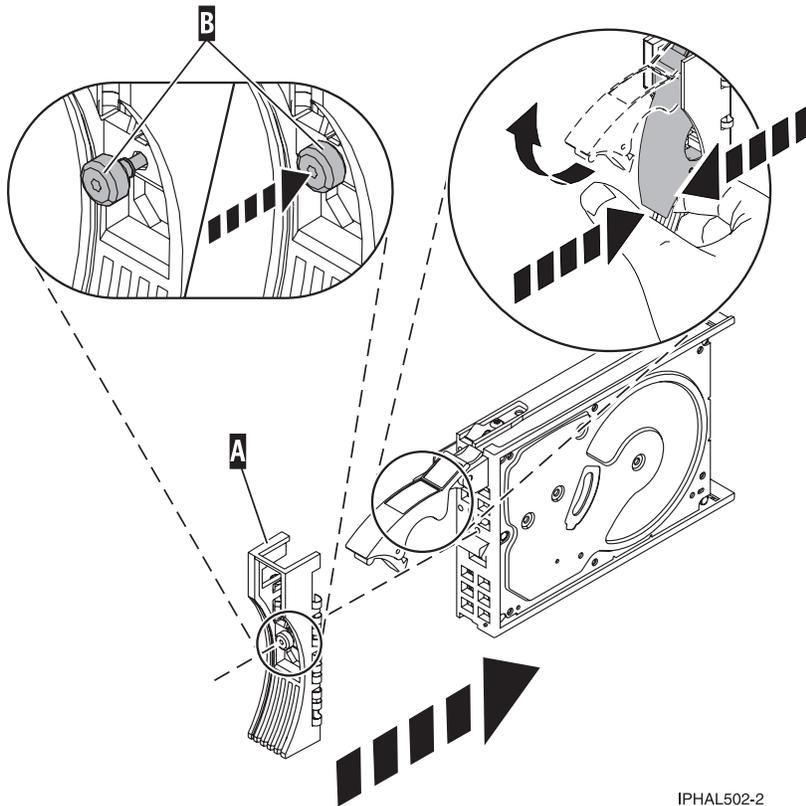


IPHAL501-2

Figure 2. 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.

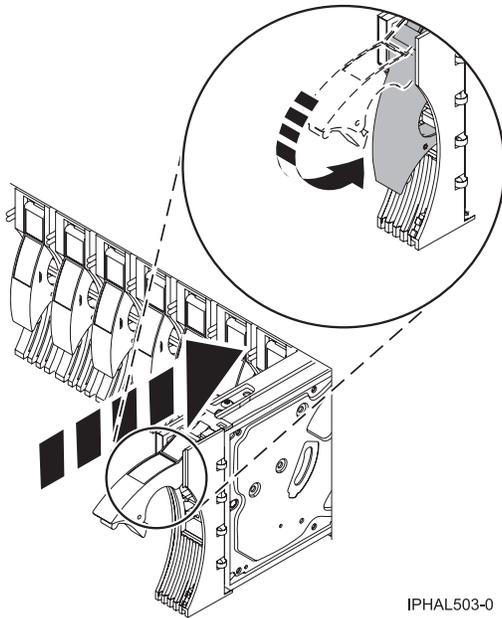
12. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
13. Remove the disk drive from the static-protective package.
14. Unlock the disk drive handle by squeezing it and pulling it out toward you. If the handle is not all the way out, the disk drive 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 3. 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 4 on page 6.
19. Push the disk drive handle in until it locks. The light on the disk drive will turn on.



IPHAL503-0

Figure 4. Installing a disk drive in a model

20. Press Enter.
21. If you are installing more than one disk drive, repeat step 1 on page 3 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:

About this task

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
2. Install or close the system, expansion unit, or rack door.
3. Verify the installed part. For instructions, see “Verify an installed feature or replaced part on an AIX system or logical partition” on page 151.
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 79.

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

You might need to install a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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.

Before you begin

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 provided power cord. Do not use the 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.

(D005a)

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 17.

- 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.

About this task

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 101.

2. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Removing and replacing expansion unit cover or door” on page 125
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
 - 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 58.

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.

Results

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 (ESD) 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 5 on page 9.

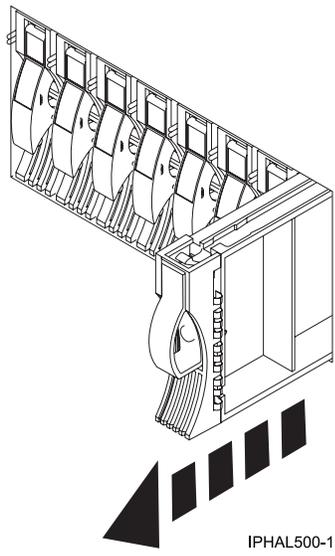


Figure 5. Removing a disk-drive filler from model

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

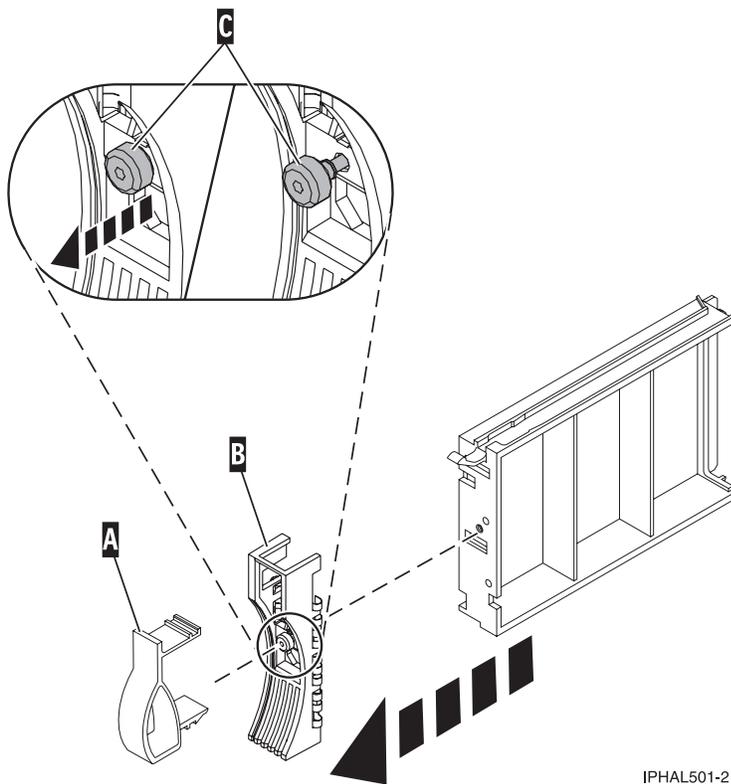
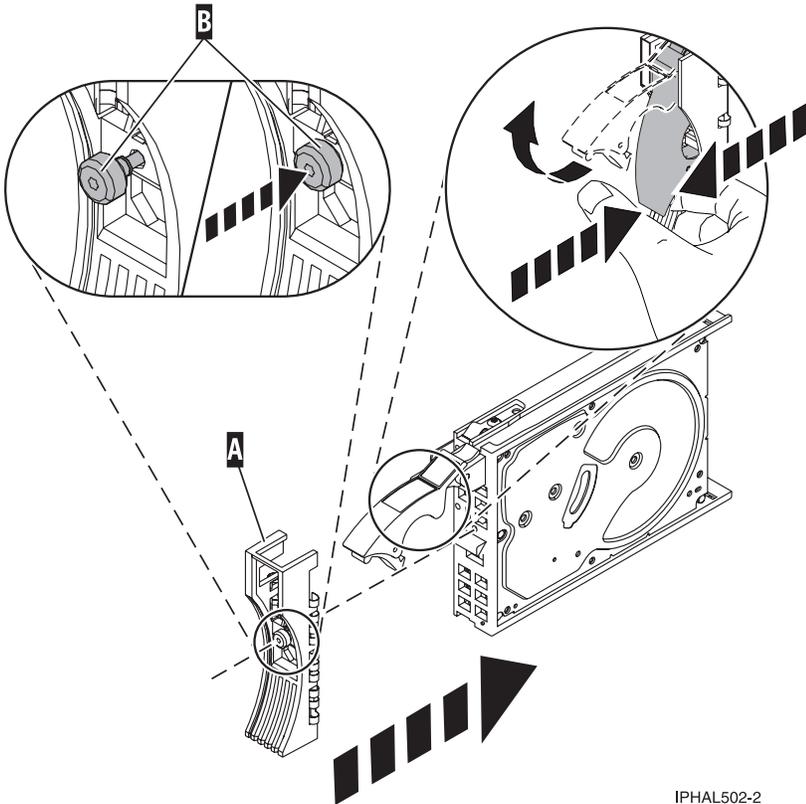


Figure 6. Removing the disk-drive bezel

- 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:
 - a. Attach the bezel **A** to the disk drive, as shown in the following figure.



IPHAL502-2

Figure 7. 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 8 on page 11.

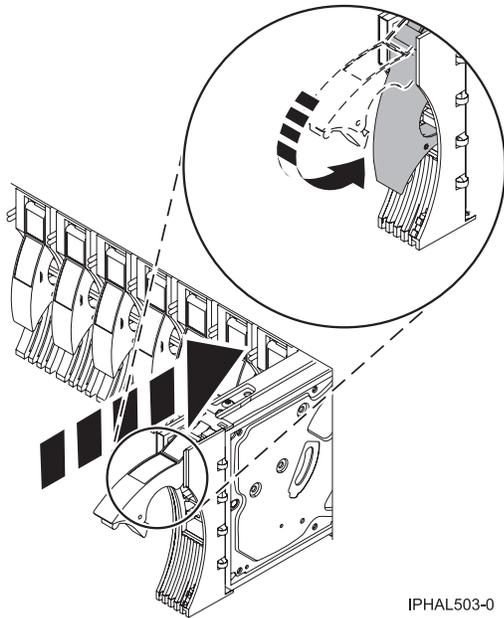


Figure 8. Installing a disk drive in a model

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 models ” on page 76
 - “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
 - “Disk-drive concurrent maintenance lights for 58/86 disk-drive enclosure” on page 78
8. If you are installing more than one disk drive, repeat step 1 on page 8 through step 7 on page 10, 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/ipr3   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/ipr2   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/ipr1   Operational
03060038 IBM      5703001             001 /dev/ipr0   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 9. 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:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.
3. Configure the newly installed disk drive for your environment. For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

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 10. 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 Configuration Utility display is shown.
5. Select **Work with disk unit recovery** from the 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 11. 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 (ESD) 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 12 on page 14.

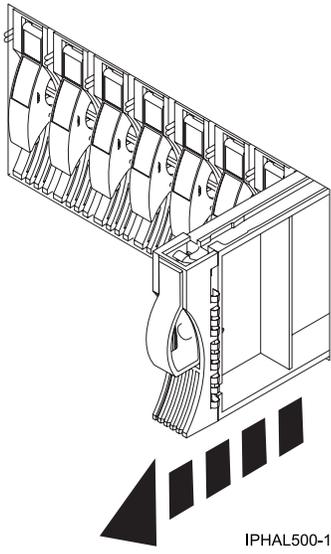


Figure 12. Removing a disk-drive filler from model

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

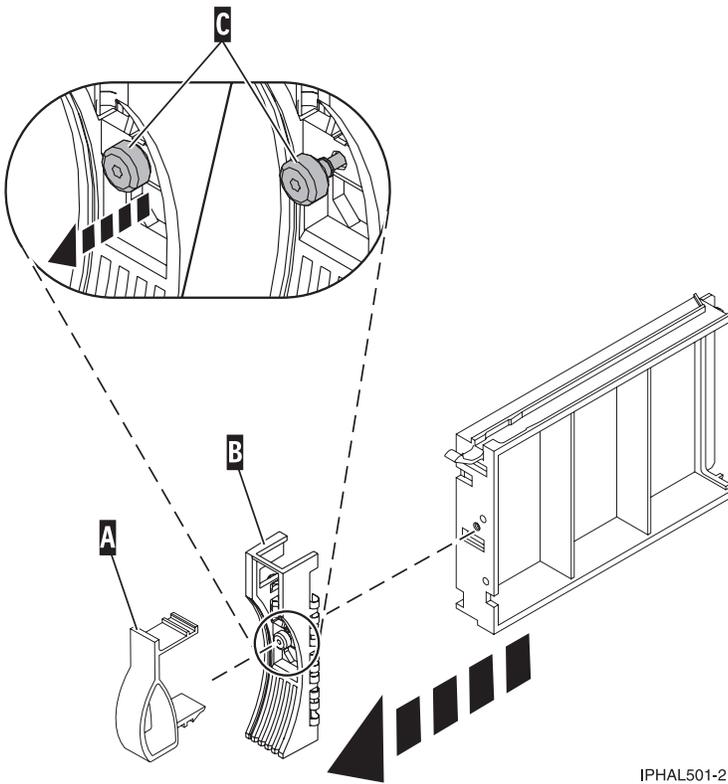


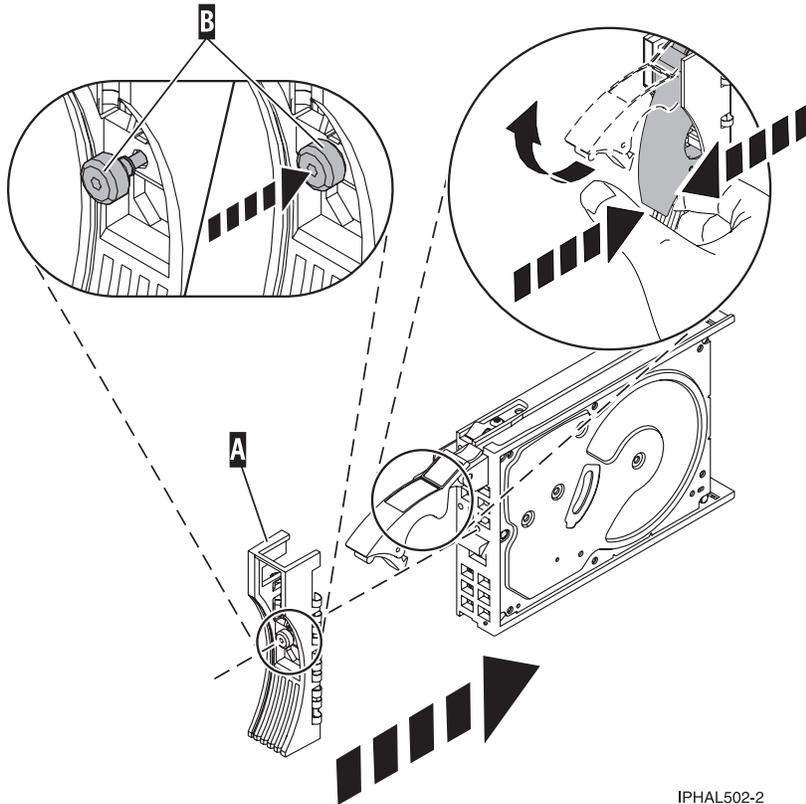
Figure 13. Removing a disk-drive bezel from the disk drive.

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 14. 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 15 on page 16.

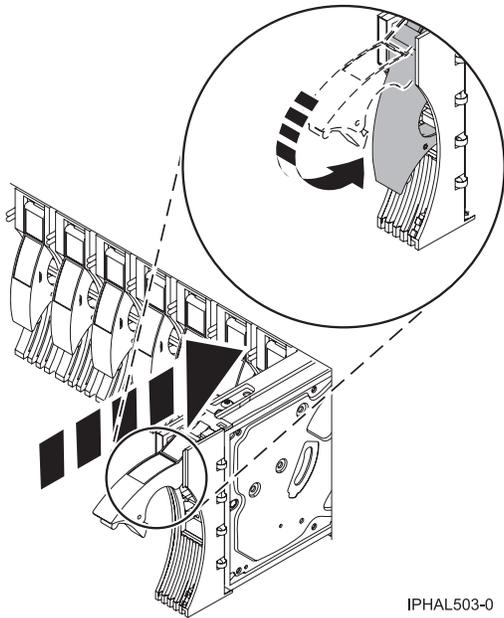


Figure 15. Installing a disk drive in a model

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 models ” on page 76
 - “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
18. If you are installing more than one disk drive, repeat step 2 on page 13 through step 17 until all disk drives are installed.

Verify that the new disk drive is operational:

About this task

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 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.
l=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 16. Example Display Hardware Status

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

Complete the procedure:

About this task

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - “Install the front cover on the 11D/11 expansion unit” on page 127
 - 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.
3. Configure the newly installed disk drive for your environment. For information, go to the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

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

You might need to install a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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.

About 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 provided power cord. Do not use the 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.

(D005a)

Prepare the system:

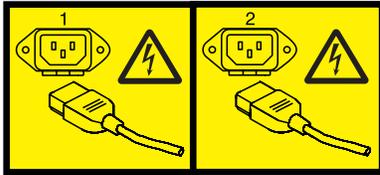
1. Perform prerequisite tasks as described in "Before you begin" on page 101.
2. Remove the system unit door or expansion unit door, or open the rack. For instructions, select the appropriate procedure from the following list:
 - "Removing and replacing expansion unit cover or door" on page 125
3. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - "Removing the front cover from the model 34E/MA, 17M/MA, or " on page 137
 - "Removing a front cover from the 11D/20 expansion unit" on page 128
 - 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 58.

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 a system or logical partition” on page 116.
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:

About this task

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 (ESD) 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 17 on page 20.

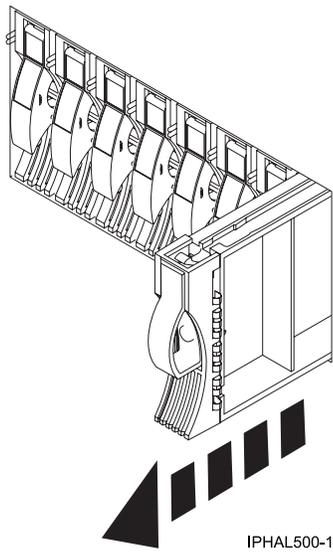


Figure 17. Removing a disk-drive filler from a model

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

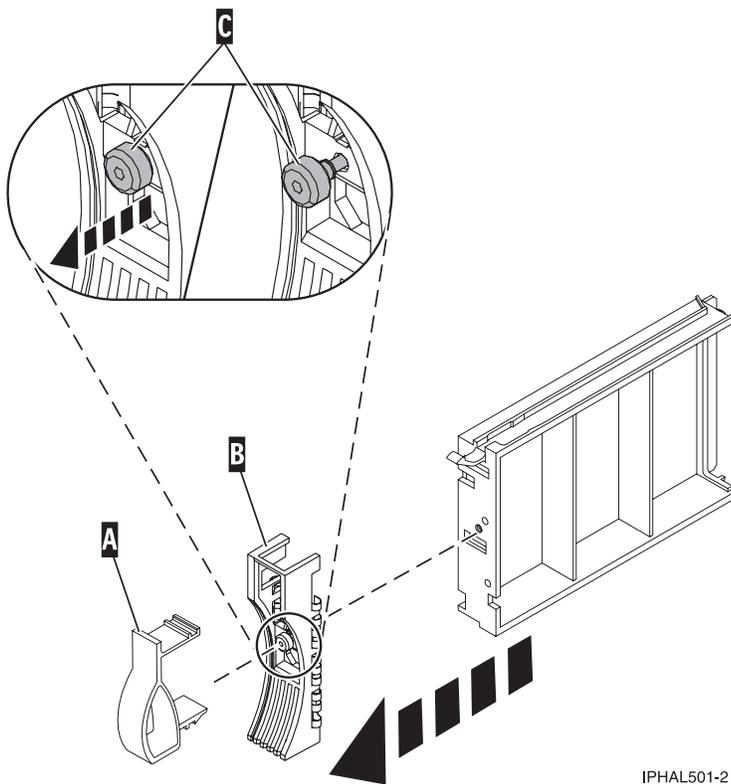
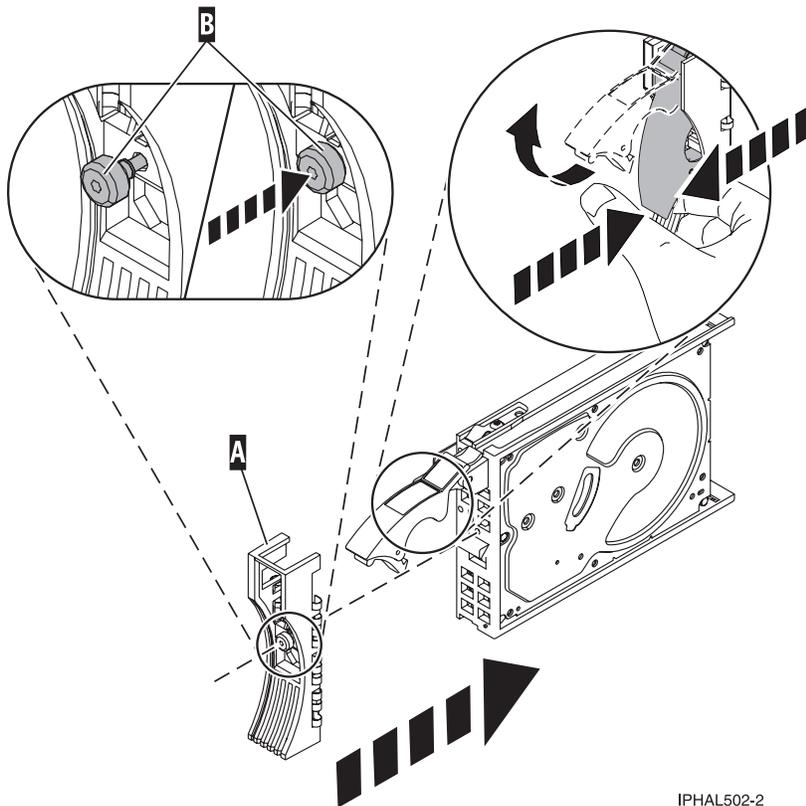


Figure 18. Removing a disk-drive bezel

- 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 19. 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 20 on page 22.

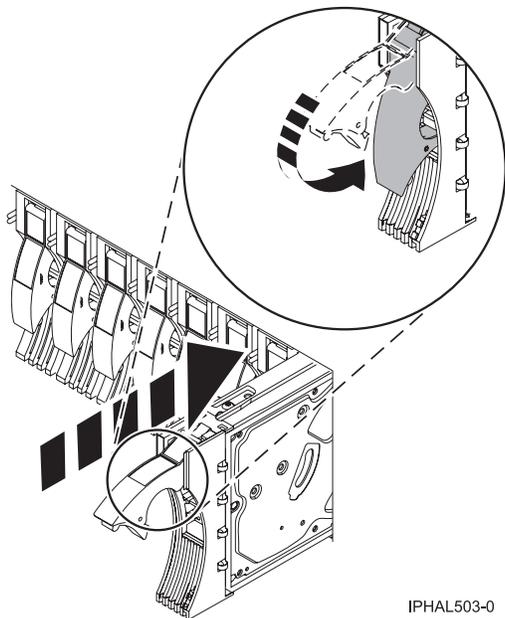


Figure 20. Installing a disk drive in a model

9. If you are installing more than one disk drive, repeat step 1 on page 19 through step 8 on page 21 until all disk drives are installed.

Complete the procedure:

About this task

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.
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 112.
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 79
 - For information on configuring the newly installed disk drive for a Linux environment, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.

Remove a disk drive

You might need to remove a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) disk drive from the server 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 23. 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 “Removing a part using the Hardware Management Console” on page 149.

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.”
- “Replace a disk drive with the Linux system or logical partition powered on” on page 29.

Replace a disk drive

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

About this task

Note: These instructions (the first 3 sections) can also be used if you are replacing an SAS disk drive.

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 22, then install the new disk drive as described in “Install a disk drive” on page 1. 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 “Exchange a part using the Hardware Management Console” on page 150.

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.

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

You might need to replace a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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.

About 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 provided power cord. Do not use the 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.

(D005a)

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 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 101.
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 79.

3. Remove the system unit door, expansion unit door, or the rack door. For instructions, select the appropriate procedure from the following list:
 - “Removing and replacing expansion unit cover or door” on page 125
4. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
 - If you have a front cover from any other models, remove the front cover.

Results

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 50.

Remove the disk drive:

1. Log in as root user.
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 on the adapter that your drive is attached to.

Tip: One or both of these options might be available, depending on 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 step 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 50.
 - If you have RAID drives attached to any other adapter, go to the *PCI-X SCSI RAID Controller Reference Guide for AIX*.
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 in 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*.
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 models ” on page 76
- “Disk-drive concurrent maintenance lights for 11D/20” on page 77
- “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77

12. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown in Figure 21.

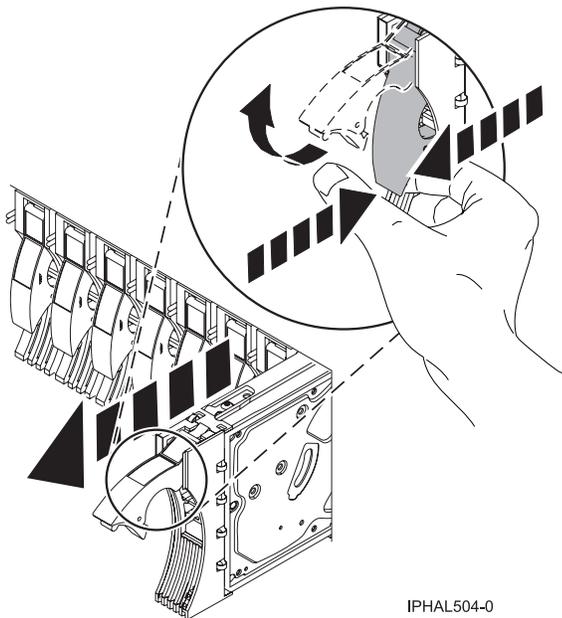
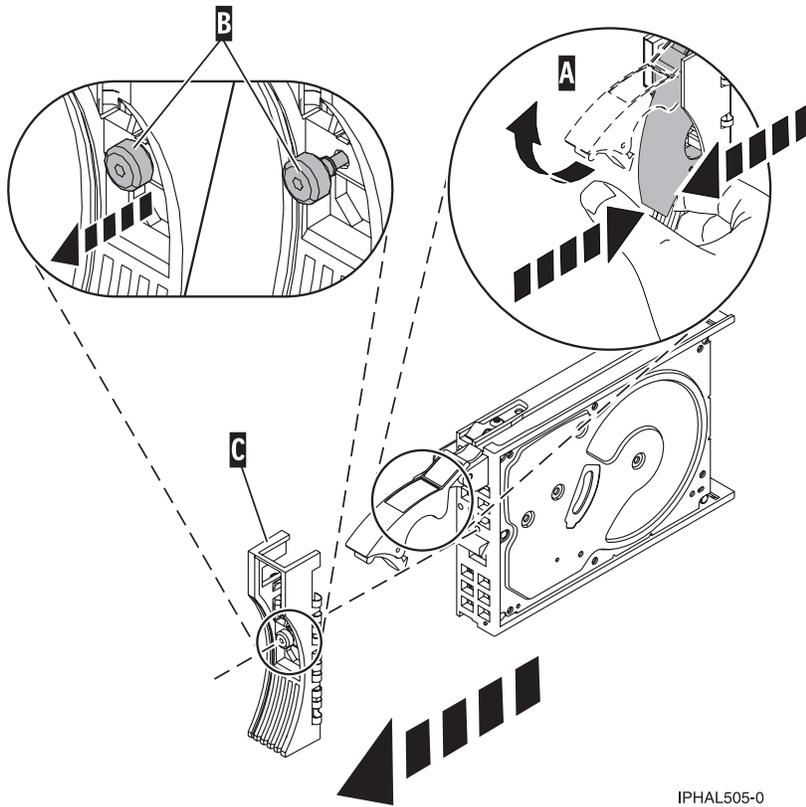


Figure 21. Removing a disk drive from a model

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, perform the following step.

Important: If the disk drive bezel does not have a thumbscrew, it is not removable and is a Serial Attached SCSI (SAS) disk drive. The replacement drive should come with an attached bezel.

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

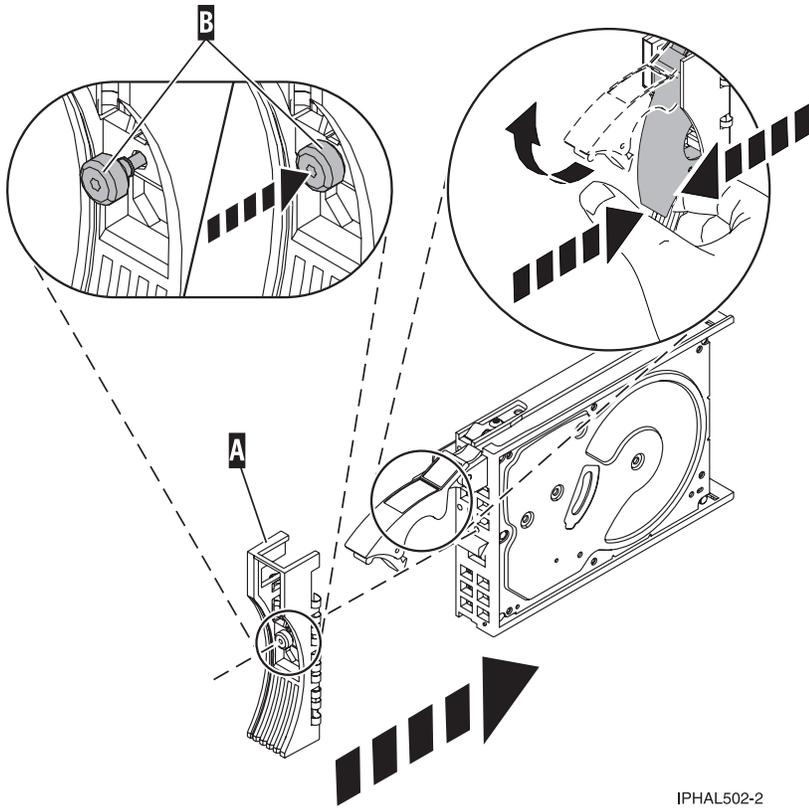


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Figure 22. Removing a disk-drive bezel

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 23. Installing a disk-drive bezel

6. Install the disk drive as shown in Figure 24 on page 29.
 - 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.

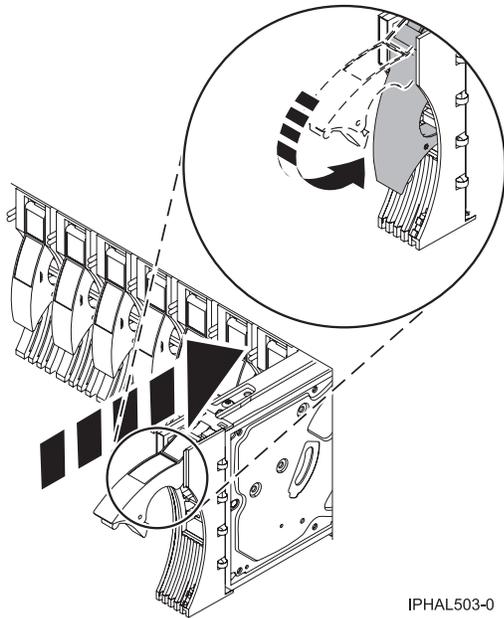


Figure 24. Installing a disk drive in a model

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:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.
3. To prepare the disk drive for use, go to “Rebuild data on a replacement disk drive using AIX” on page 79.

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

You might need to replace a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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.

Before you begin

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 provided power cord. Do not use the 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.

(D005a)

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 44, if:

- 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.

About this task

Prepare the system

1. Perform prerequisite tasks as described in “Before you begin” on page 101.

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*.
 - 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*.
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:
 - “Removing and replacing expansion unit cover or door” on page 125
5. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
 - If you have a front cover from any other models, remove the front cover.

Results

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 error messages
    2. Use vi to view 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 Storage boot time messages

Selection:

e=Exit
```

Figure 25. Kernel Messages Log

4. From the Kernel Messages Log display, select **Use vi to view most recent 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 26. Disk Unit Hardware Resource Information Details display

12. Record the physical location information.
13. Exit to the Work with Disk Units display.
14. 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*.

Remove the disk drive:

1. From the Work with Disk Units display, select **Work with disk unit recovery**. Press Enter.
2. 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 27. Example Device Concurrent Maintenance display

3. Enter either the physical location information or the PCI or SCSI location for the disk drive you want to replace. Press Enter.
4. Specify 1 (Remove device) for the action to be performed.
5. 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 models ” on page 76
 - “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
6. Press Enter.
A Device Concurrent Maintenance Action display is shown, similar to the following display.

```

Device Concurrent Maintenance Action

Removal of device:
Location: U0.1-P1-I4/Z1-A8

You have 1 minute to perform the operation

During this time, your system can seem unresponsive

c=Confirm    q=Cancel

```

Figure 28. 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.

Device Concurrent Maintenance Action In Progress

Please remove the device located in:
Location: U0.1-P1-I4/Z1-A8

Figure 29. 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 (ESD) 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 30. If the handle is not all the way out, the disk drive can not slide out of the system or expansion unit.

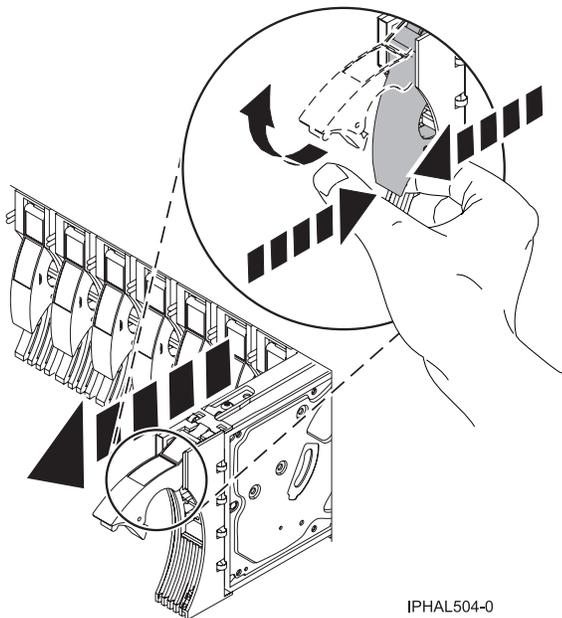
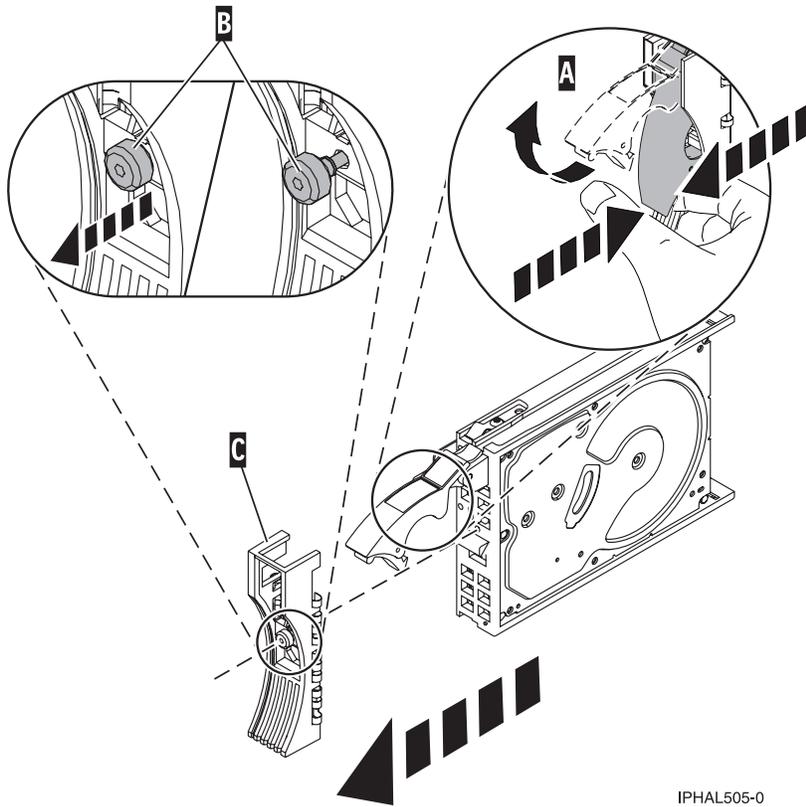


Figure 30. Removing a disk drive from a model or 11D/20

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.

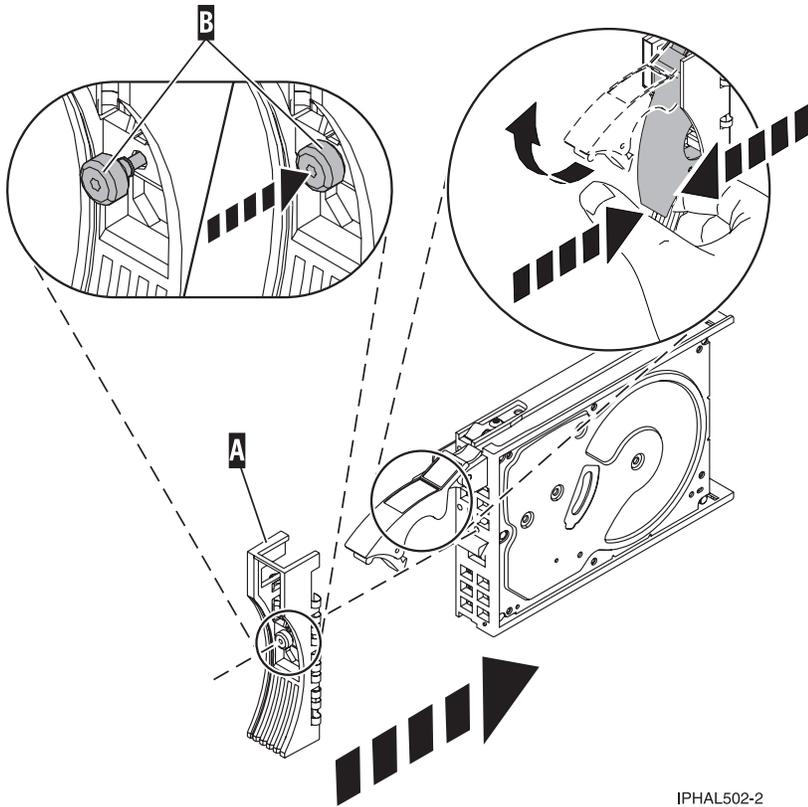


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Figure 31. Removing a disk-drive bezel

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 32. 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.

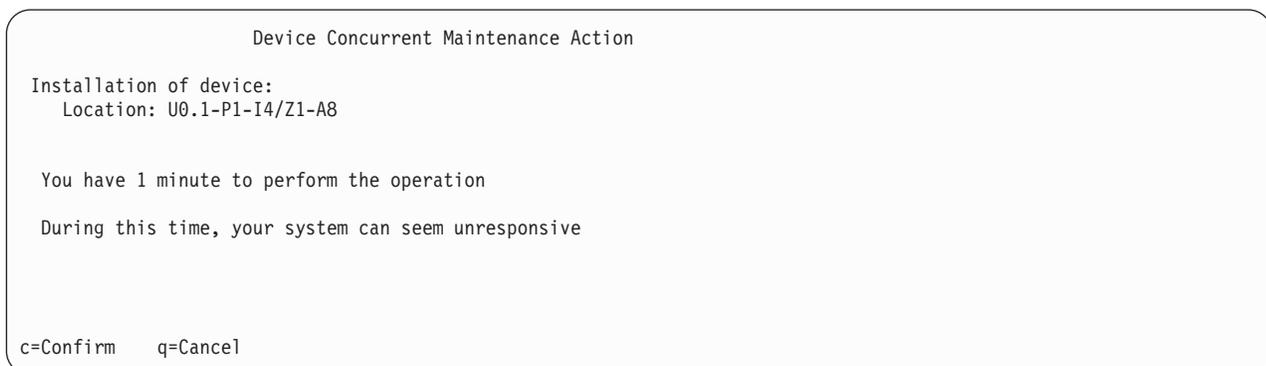


Figure 33. Example Device Concurrent Action Maintenance display

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 34. 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 35.

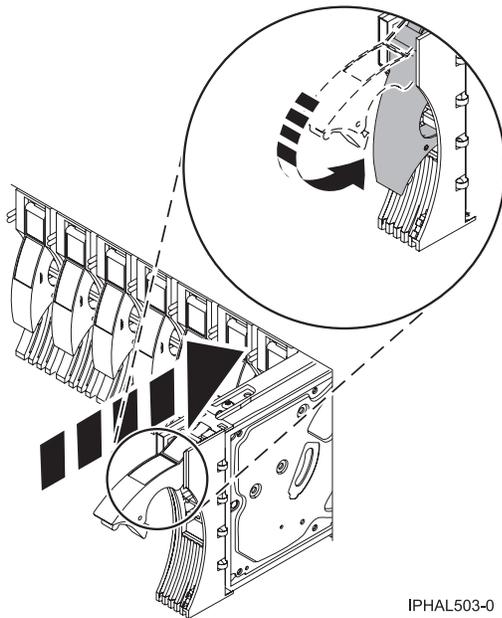


Figure 35. Installing a disk drive in a model or 11D/20

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 79.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - If you have any other models, install the front cover.
2. Install or close the system, expansion unit, or rack front door.

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 Configuration Utility display is shown.
3. Select **Analyze log**. Press Enter. The Kernel Messages Log display is shown.

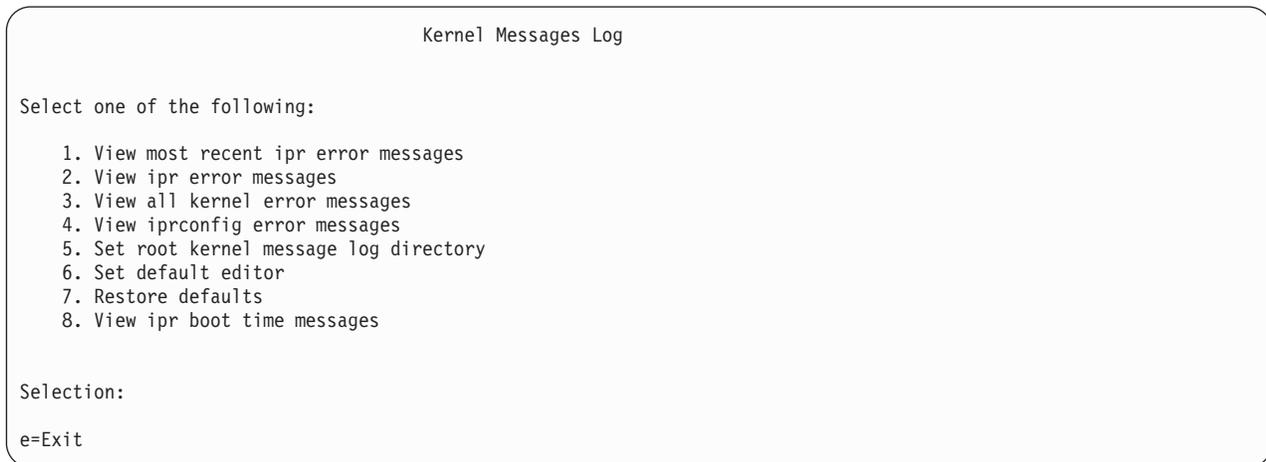


Figure 36. Kernel Messages Log

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 Configuration Utility display is shown.
11. Select **Display hardware status** from the 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 37. Example Display Hardware Status

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

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

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

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

```

Disk Unit Hardware Resource Information Details

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

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

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

Press Enter to Continue

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

```

Figure 38. Example Disk Hardware Resource Information Details display

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

Remove the disk drive:

1. From the 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 0000:41:01.0.1/0:5:	Physical Disk	Active Empty
	sdb	0000:41:01.0.1/0:4:0	Physical Disk	Active
	sda	0000:41:01.0.1/0:3:0 0000:41:01.0.1/1:8:	Physical Disk	Active 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 0001:61:01.0.2/0:8:	Physical Disk	Active 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 39. Example Concurrent Device Remove display

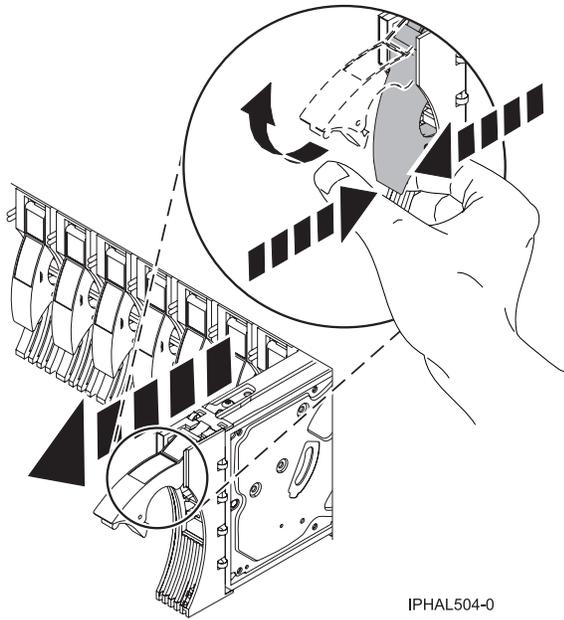
3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot. To view the locations of the concurrent maintenance lights, select the appropriate model from the following list:
 - “Disk-drive concurrent maintenance lights for models ” on page 76
 - “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
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:

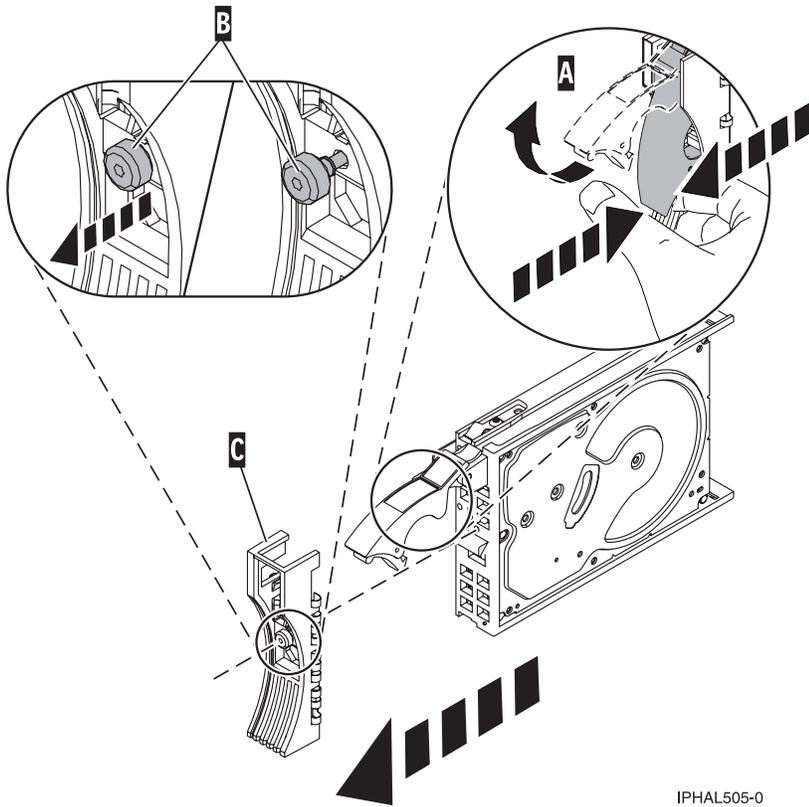
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving 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 40 on page 41. If the handle is not all the way out, the disk drive will not slide out of the system or expansion unit.



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Figure 40. Removing a disk drive from a model or 11D/20

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.



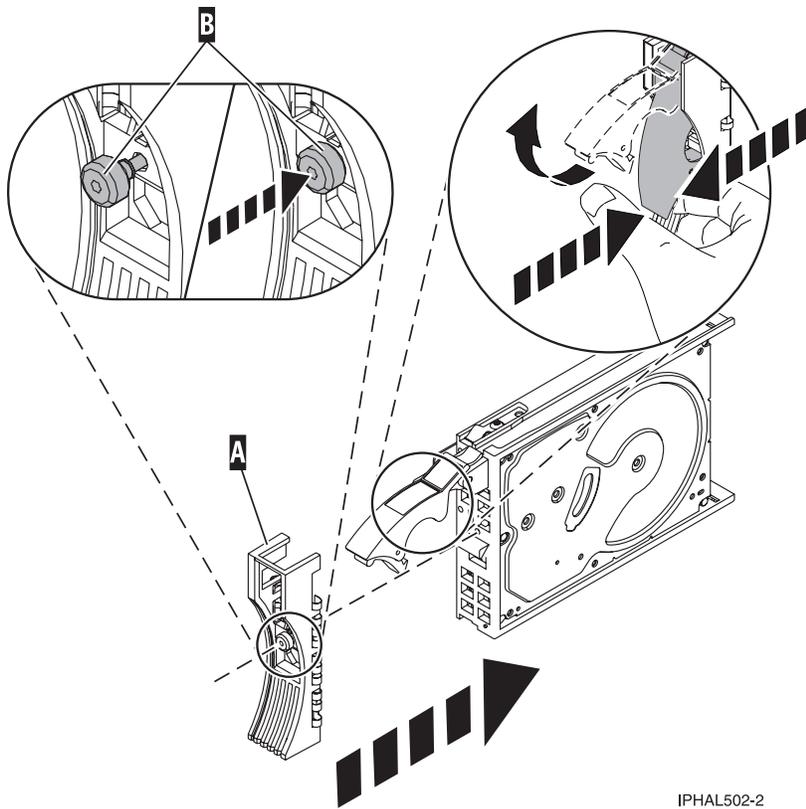
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Figure 41. Removing a disk-drive bezel

10. Press Enter on the 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.



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Figure 42. Attaching a bezel to the disk drive

5. From the 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 43. 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 44 on page 44.

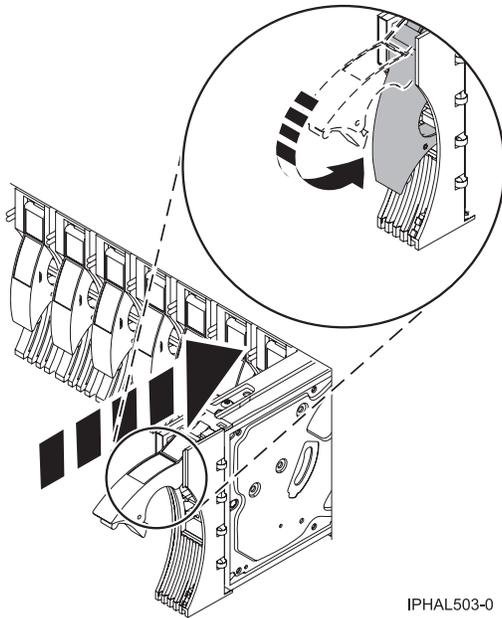


Figure 44. Installing a disk drive in a model or 11D/20

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 79.

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - If you have any other models, install the front cover.
2. Install or close the system, expansion unit or rack front door.

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

You might need to install a Small Computer System Interface (SCSI) or Serial Attached SCSI (SAS) 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.

About 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 provided power cord. Do not use the 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.

(D005a)

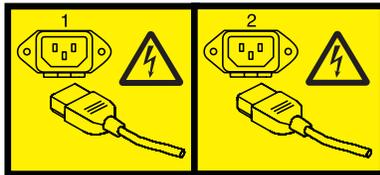
Prepare the system:

1. Perform prerequisite tasks as described in “Before you begin” on page 101.
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 on page 46.
3. Identify the disk drive to be replaced and record the location information. For information, see “Service Action Log (SAL)” on page 109.
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 79.
 - 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*.

5. Stop the system or logical partition that controls the disk drive location. For instructions, see “Stop a system or logical partition” on page 116.
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



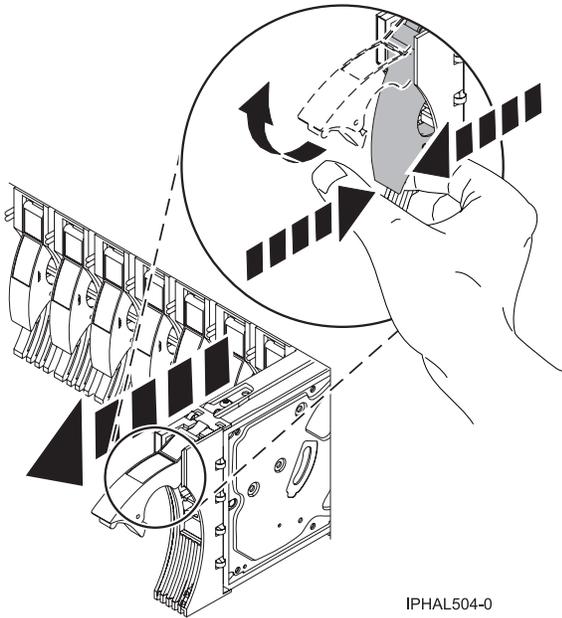
7. Remove the system unit door or expansion unit door or open the rack front door. For instructions, select the appropriate procedure from the following list:
 - “Removing and replacing expansion unit cover or door” on page 125
8. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
 - 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 45 on page 47.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) 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.

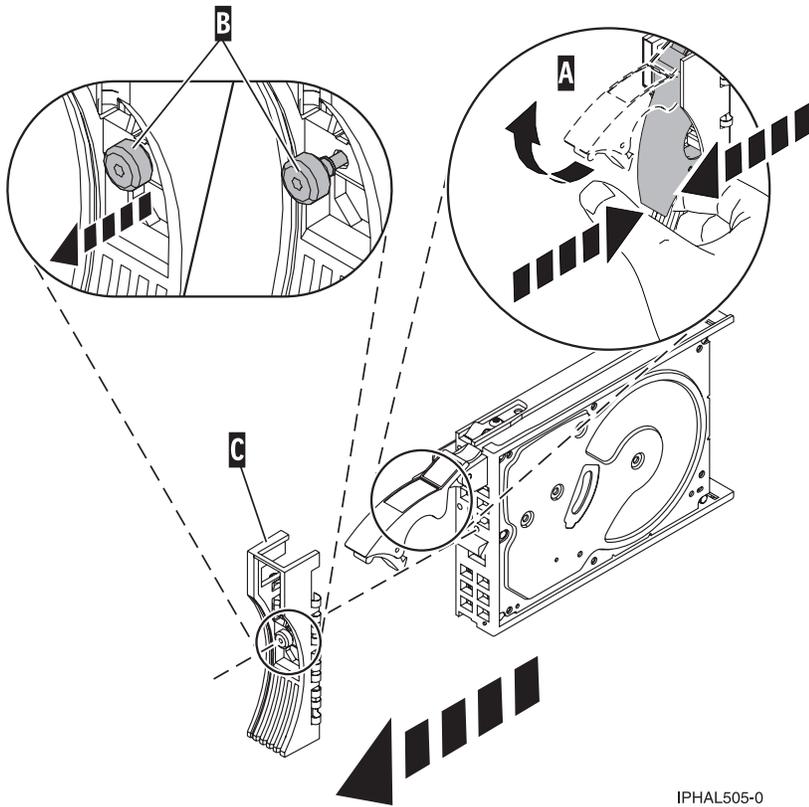


IPHAL504-0

Figure 45. Removing a disk drive from a model or 11D/20

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.

Important: If the disk drive bezel does not have a thumbscrew it is not removable and is a SAS disk drive. The replacement drive should come with an attached bezel.

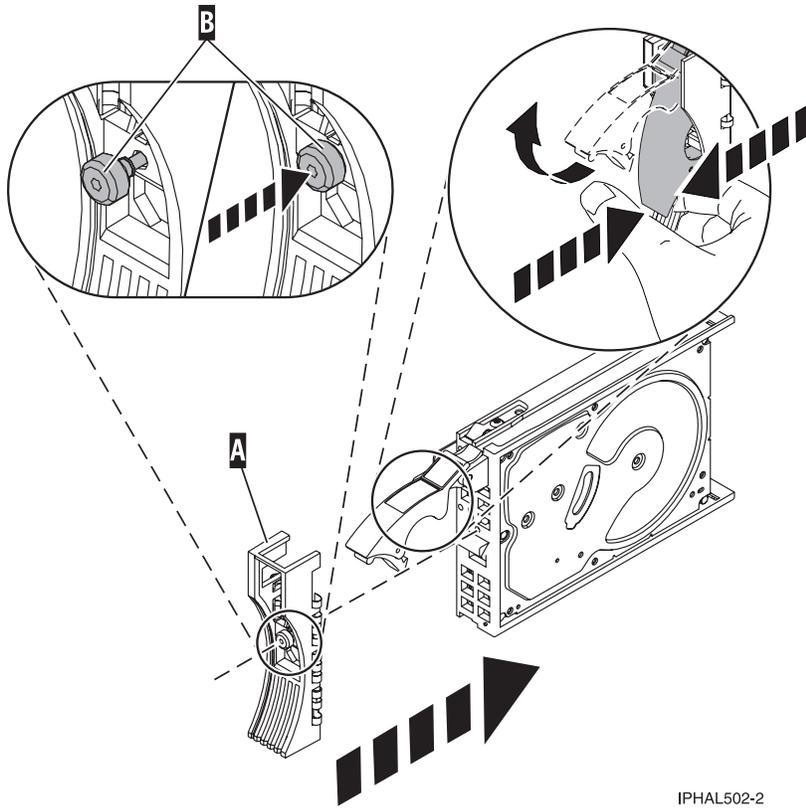


IPHAL505-0

Figure 46. 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.



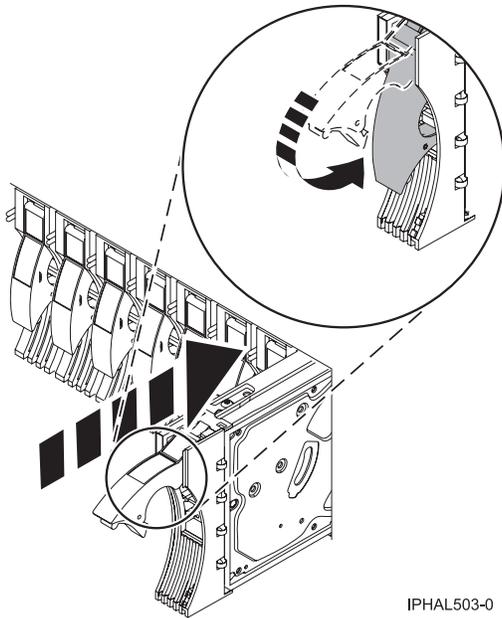
IPHAL502-2

Figure 47. 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 48 on page 50.



IPHAL503-0

Figure 48. Installing a disk drive in a model or 11D/20

Complete the procedure:

1. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.
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 112.
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 151. 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 stand-alone diagnostics” on page 156.
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 79
 - “Rebuild data on a replacement disk drive using Linux” on page 79

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.

Remove the disk drive:

1. Log in as root user.
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 models ” on page 76
 - “Disk-drive concurrent maintenance lights for 11D/20” on page 77
 - “Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure” on page 77
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.

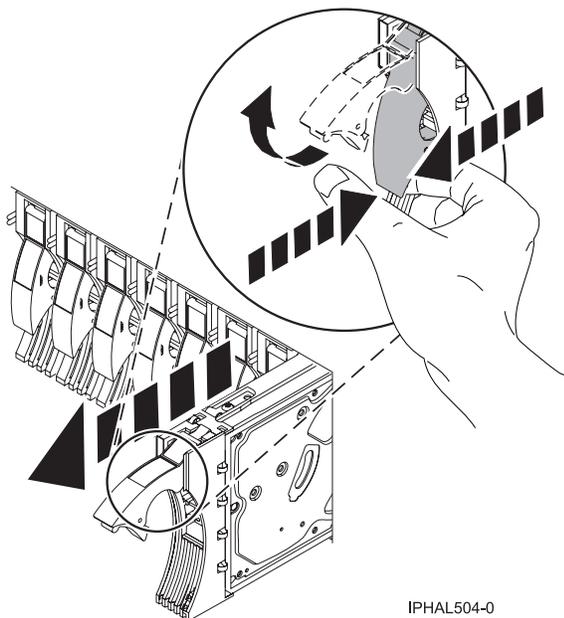
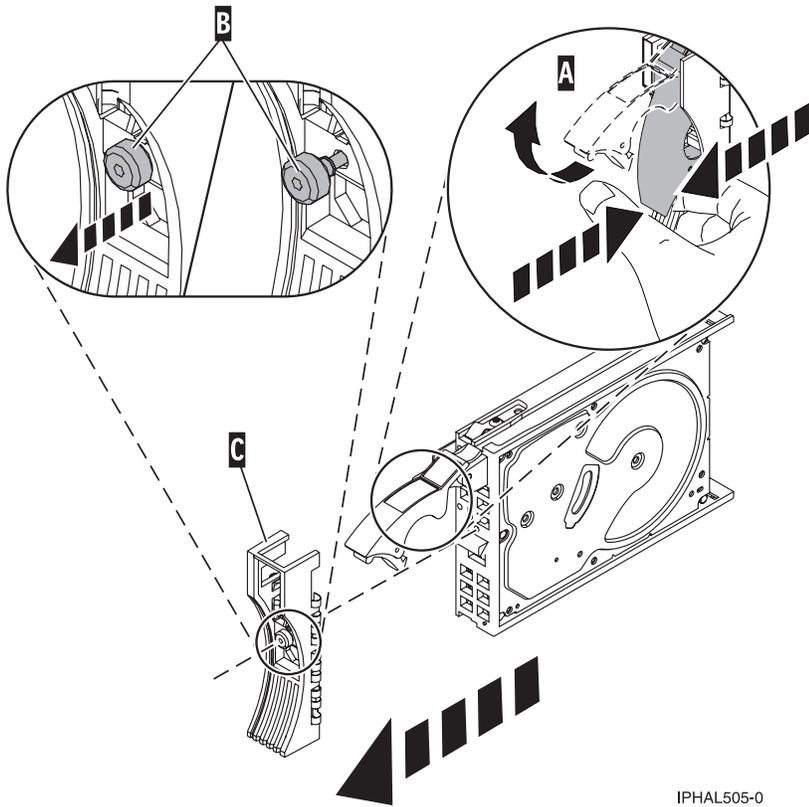


Figure 49. Removing a disk drive from a model or 11D/20

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.

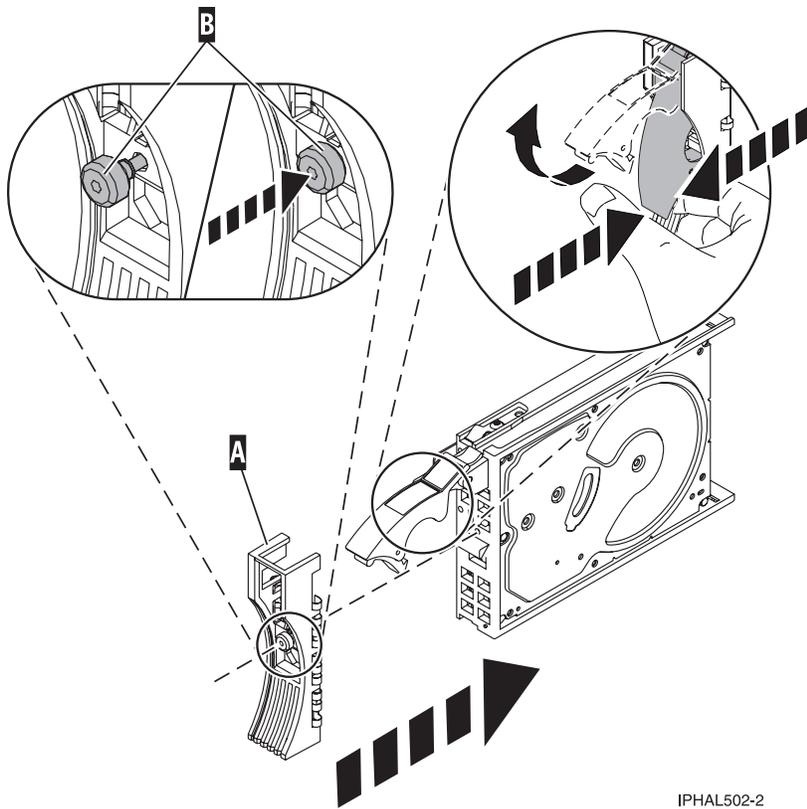


IPHAL505-0

Figure 50. 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.



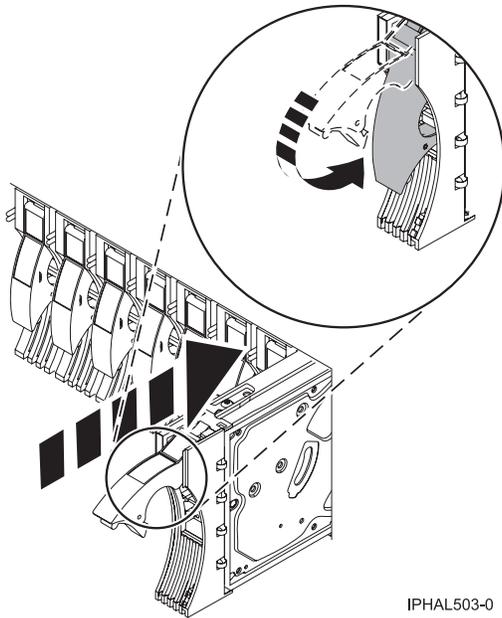
IPHAL502-2

Figure 51. 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 52 on page 54.



IPHAL503-0

Figure 52. Installing a disk drive in a model a model or 11D/20

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:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.
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 151. 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 stand-alone diagnostics” on page 156.
4. To prepare the disk drive for use, go to “Rebuild data on a replacement disk drive using AIX” on page 79.

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.

About 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:
 - “Removing and replacing expansion unit cover or door” on page 125
2. Remove the front cover. For instructions on removing the cover, select the appropriate procedure from the following list:
 - “Removing the front cover from the model 34E/MA, 17M/MA, or ” on page 137
 - “Removing a front cover from the 11D/20 expansion unit” on page 128
 - 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 53 on page 56.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) 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.

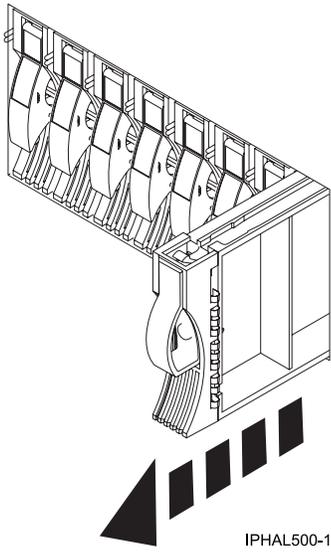


Figure 53. Removing a disk-drive filler from a model or 11D/20

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

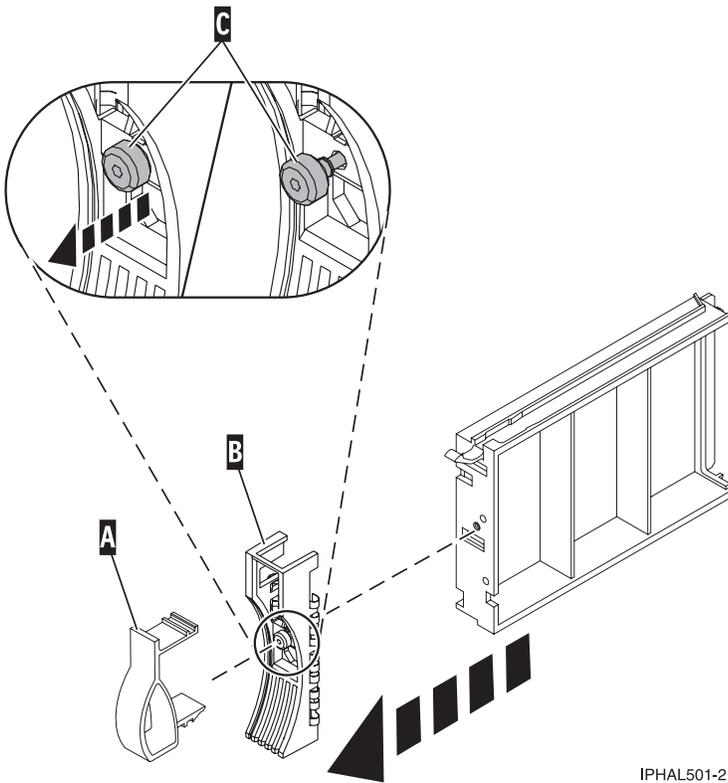


Figure 54. Removing a disk-drive bezel

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 (ESD) 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.

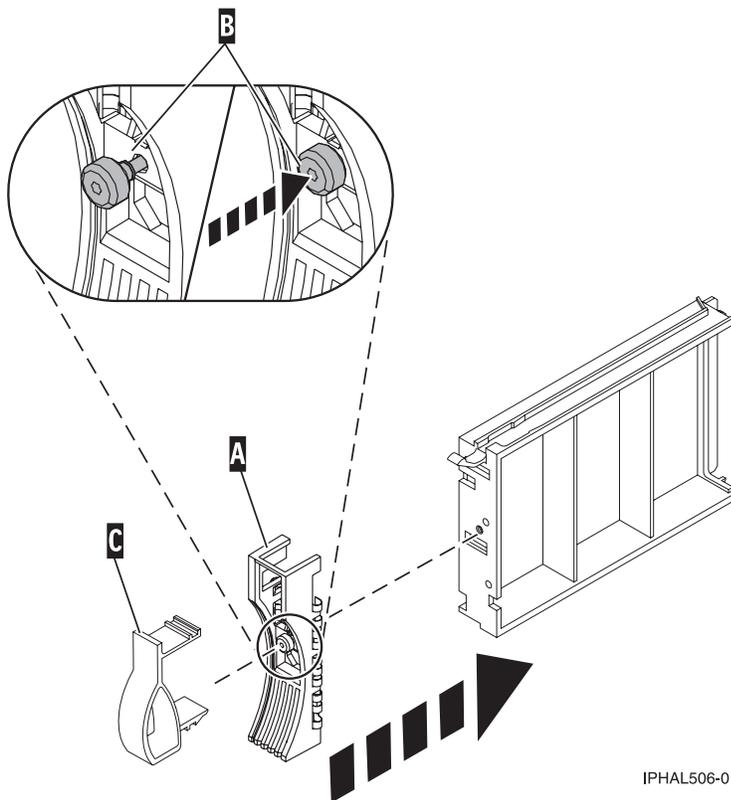


Figure 55. Attaching a bezel to a disk-drive filler

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

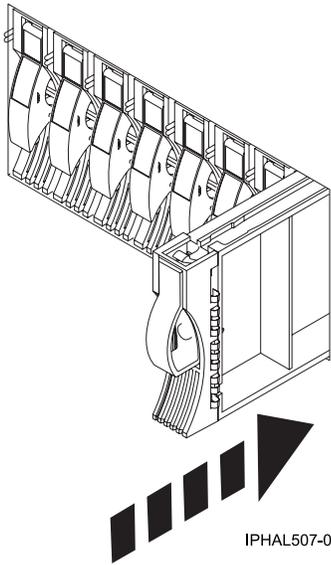


Figure 56. Installing a disk-drive filler

5. Replace the front cover. For instructions on replacing the cover, select the appropriate procedure from the following list:
 - “Installing the front cover on the model 34E/MA, 17M/MA” on page 138
 - “Installing a front cover on the 11D/20 expansion unit” on page 128
 - 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.

Disk drive locations

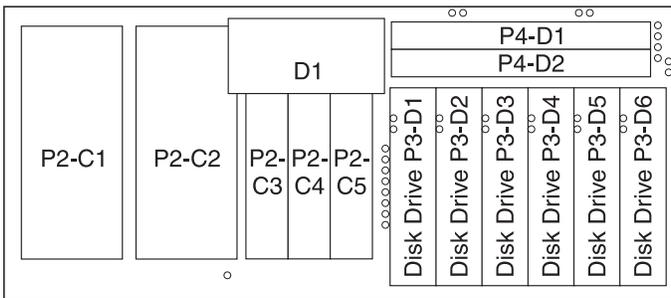
Find out where the disk drives are located on different models.

Locate your system or expansion unit to find the disk drive locations.

Disk drive locations for models

Learn the disk drive locations for your system.

The following figure shows the disk drive locations for the models .



IPHAL650-2

Figure 57. Model disk drive locations

Disk drive locations for the 11D/20 expansion unit

Learn the disk drive locations for your expansion unit.

The following figure shows the disk drive locations for the 11D/20 expansion unit.

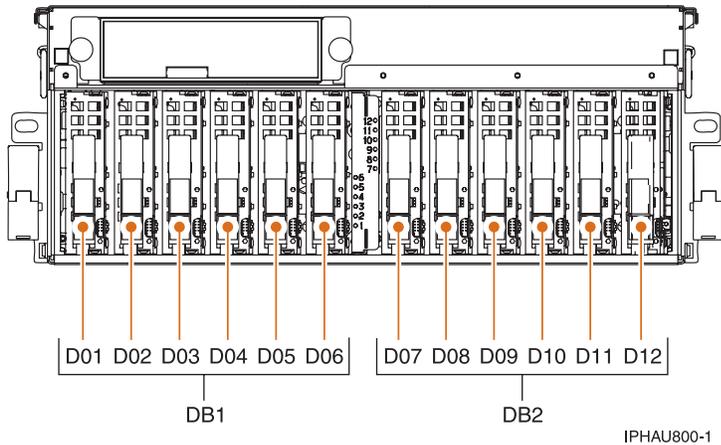


Figure 58. Disk drive locations for the 11D/20 expansion unit

Disk drive locations for the 03E/4A and 04E/8A expansion unit

Learn the disk drive locations for your expansion unit.

The following figures show the disk drive locations for the 03E/4A and 04E/8A expansion units.

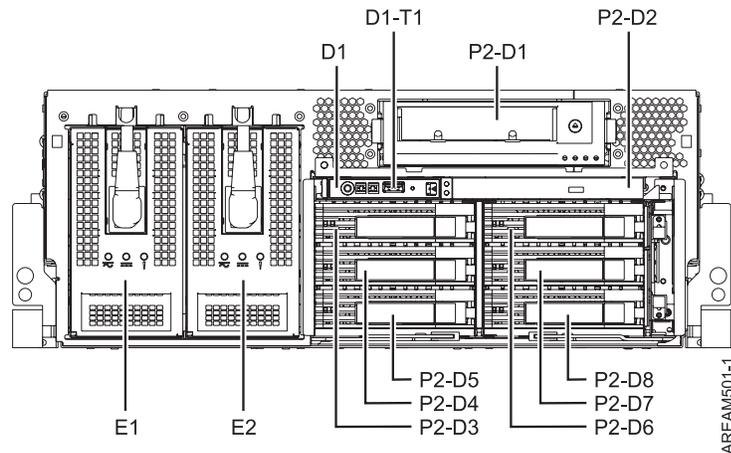


Figure 59. Disk drive locations for the SAS disk drives

Disk drive locations for the 58/86 disk enclosure

Learn the disk drive locations for your disk enclosure.

The following figure shows the disk drive locations for the 58/86 disk enclosure.

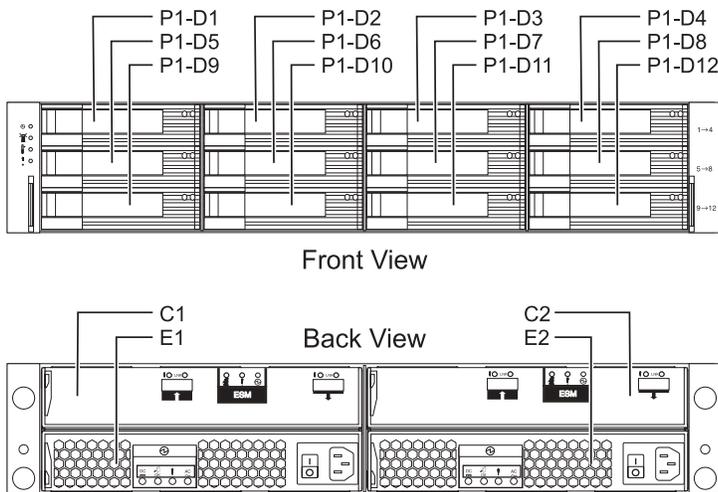


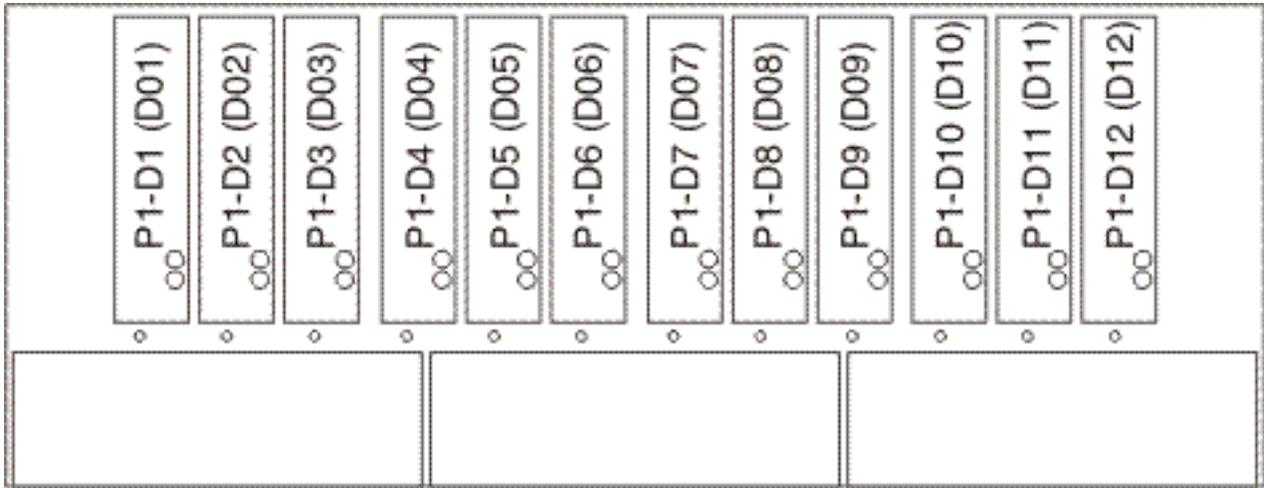
Figure 60. Disk drive locations for the 58/86 disk enclosure

Disk drive locations for the 31D/24, or 31T/24 SCSI disk-drive enclosure

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

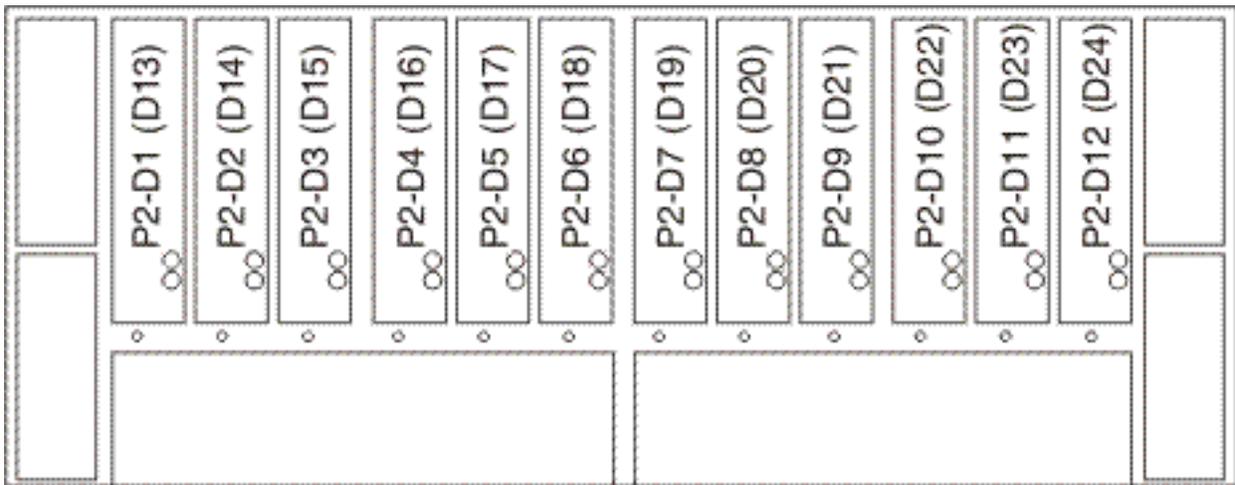
The available disk drive locations depends on the number of SCSI interface cards installed in the SCSI disk-drive enclosure. If the next available disk drive position is the first slot in a disk-drive enclosure such as D21, D26, or D46, look at the disk-drive controller to verify that the enclosure is 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.

The following figures shows the disk drive locations for the front and back of the 31D/24, or 31T/24 SCSI disk-drive enclosure.



IPHAL975-0

Figure 61. Front view of 31D/24, or 31T/24 SCSI disk-drive enclosure.



IPHAL976-0

Figure 62. Back view of 31D/24, or 31T/24 SCSI disk-drive enclosure

31D/24, or 31T/24 SCSI disk-drive enclosure

Learn about the SCSI disk-drive enclosure and how to assemble it.

This SCSI disk-drive enclosure can hold up to 24 disk drives. The enclosure is organized into 4 groups, with each group containing 6 disk drive slots. The enclosure can be used as a stand-alone tower or a rack-mounted drawer.

When connecting with your server, you can connect your SCSI cables to either a single initiator repeater card or to a dual initiator repeater card on your SCSI disk drive enclosure. The dual initiator repeater card allows for high availability and combining groups of disk drive slots.

Tip: Before you connect the enclosure, you will need the following information:

- You will want to install the SCSI adapter you will use to connect the enclosure to your system. Either print this task or complete it and return here. To view the PDF file of PCI adapters, approximately 40 MB in size, see [oemiphak.pdf](#).

- For systems or partitions with AIX or Linux as the operating system, you will want to have the SCSI adapter information for your operating system. This will be critical information for configuring the disks after you have attached the enclosure you will want to print the information before you begin the procedure. This guide is available from the SCSI PCI Adapters (http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm) web page.
- If you are going to configure RAID arrays, ensure you have the following number of available disks for each RAID level:

RAID 0 or 1

Two drives per array

RAID 5

At least 3 drives per array

RAID 6

At least 4 drives per array

Connect the 31D/24, or 31T/24 to a system with the AIX operating system

Use the information in this section to understand the cabling, SCSI addressing, and post connection requirements for the disk-drive enclosure.

1. Install the initiator repeater cards into the disk drive enclosure. For instructions, see “SCSI repeater card” on page 71.
2. Connect the SCSI cable to your repeater card. Choose one of the following methods based on your situation:
 - If you are using only single repeater cards or only dual repeater cards, install your SCSI cable **A** to the initiator repeater card **B** as shown in the following figure.
 - **Single SCSI adapter connected to single repeater card:** If in this case you are not sharing resources (disk drives), simply attach each SCSI cable to each repeater card.

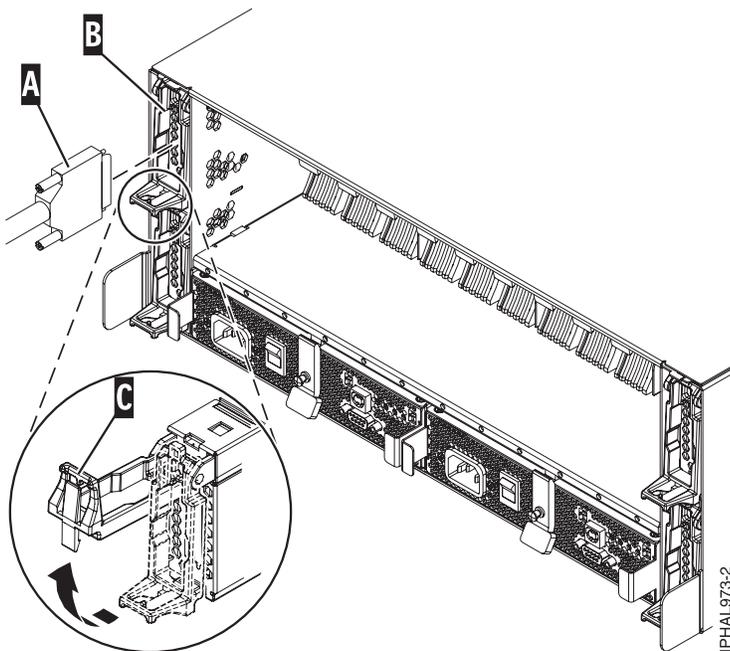


Figure 63. SCSI cable to single repeater card

- **Two SCSI adapters connected to dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI

disk-drive enclosure in an AIX clustered environment” on page 65.

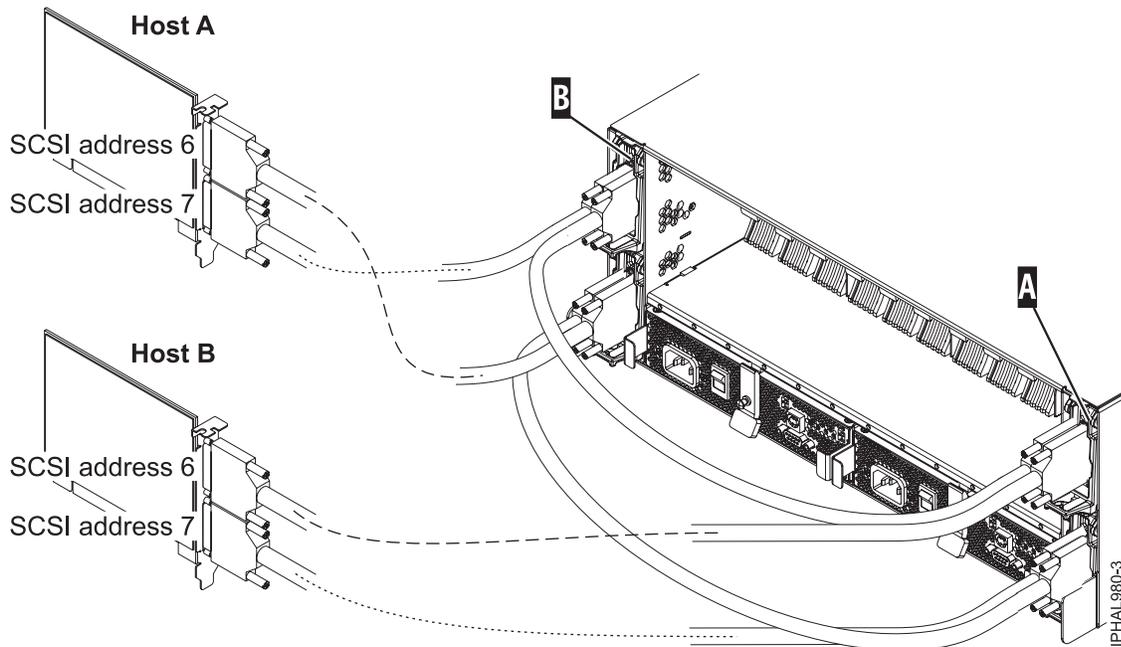


Figure 64. SCSI cable to dual repeater card connected with two SCSI cards

- **Four SCSI adapters connected to dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment” on page 65.

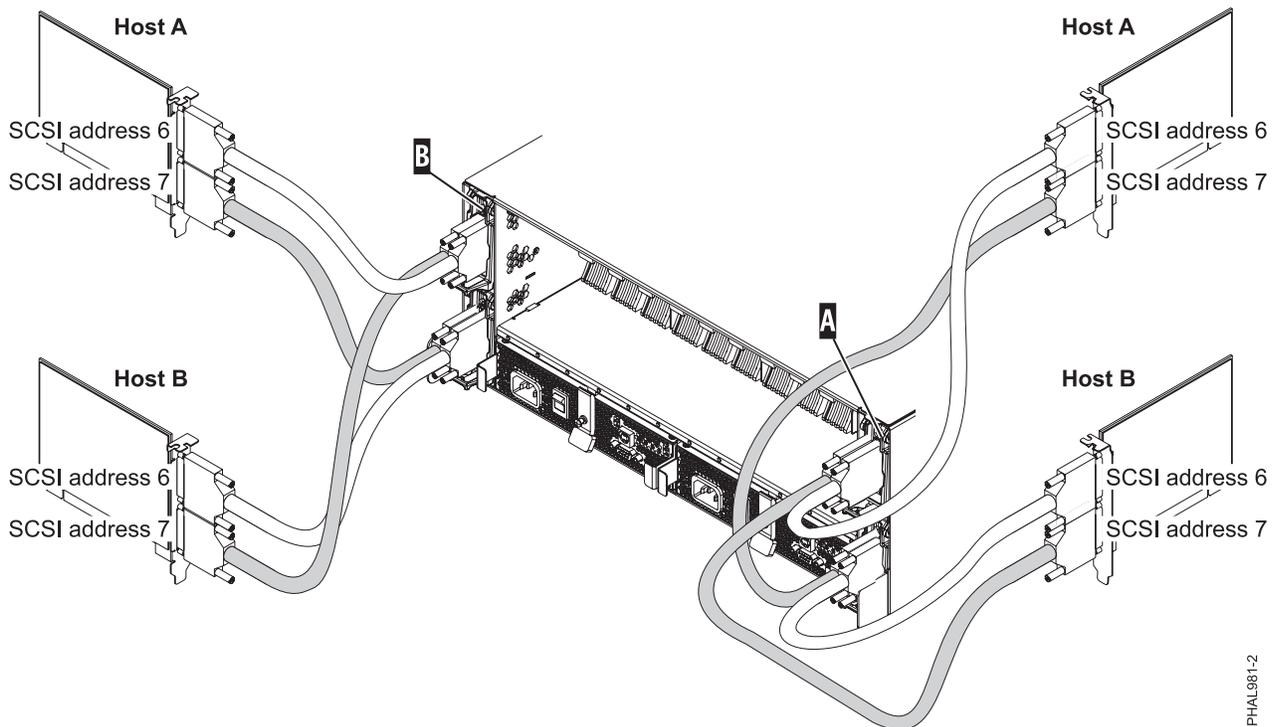


Figure 65. SCSI cable to dual repeater card connected with four SCSI cards

- **Single SCSI adapter connected to a combination of single and dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment” on page 65.

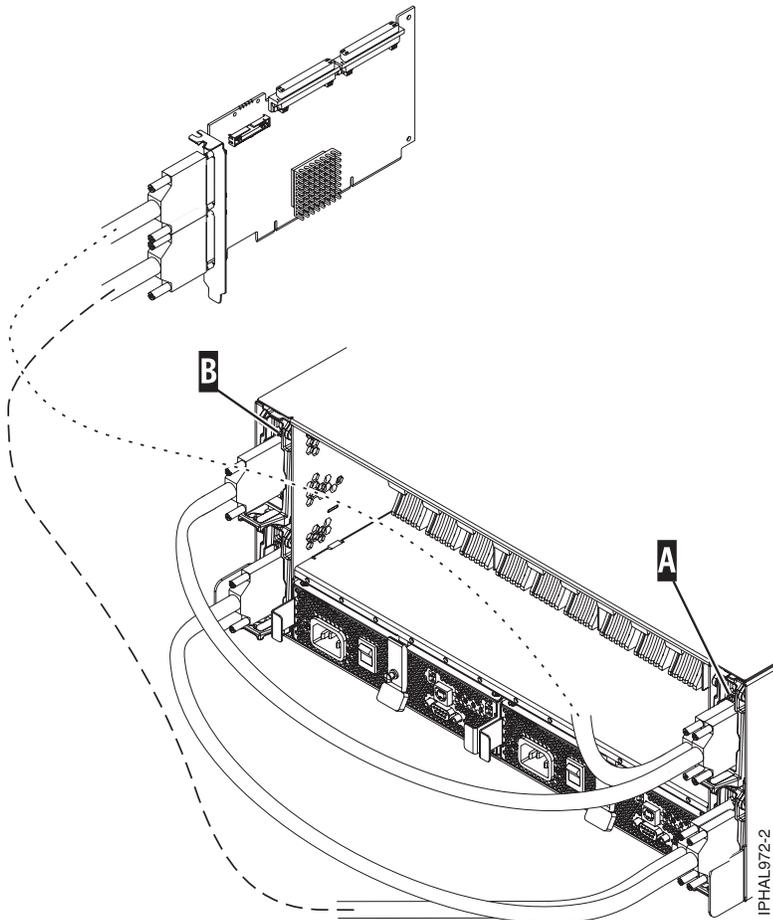


Figure 66. SCSI cable to dual repeater card connected to single repeater card

3. Use the information that you printed for the SCSI adapter to complete the configuration of your disk drives. For more information see the SCSI PCI Adapters (http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm) Web page and locate the file for the adapter you are using to attach the enclosure to your system.

Important: If you plan on using the disk enclosure in an AIX environment, it is critical that you set up an AIX CRON job so that if errors exist, they report to the attached system. The AIX CRON job needs to be setup during the initial installation.

Note: Errors on disks in the enclosure will be found without this CRON job (script) through normal Automatic Error Log Analysis; however, other errors such as fan and power supply problems in the enclosure can only be found when running diagnostics manually, which is accomplished by using the following scripts.

To collect enclosure errors, add this CRON job SES Healthcheck to the system CRON table. Edit the system CRON with the crontab -e command. At the bottom of that file, enter:

```
* 3 * * * /usr/lpp/diagnostics/bin/run_ses_healthcheck 1>/dev/null 2>/dev/null
```

This CRON runs the script "run_ses_healthcheck" daily at 3 A.M. The script's contents depend on the configuration of the system that the enclosure is attached to.

Example 1

If the system the enclosure is attached to has either an HMC or is running Electronic Service Agent™, create the file named "run_ses_healthcheck" in the /usr/lpp/diagnostics/bin directory, with the following contents:

```
-----  
#!/bin/ksh  
#Name:run_ses_healthcheck  
#Location:/usr/lpp/diagnostics/bin  
#Function: SCSI SES hourly heathcheck  
for i in `lsdev -Cc container -t ses -s scsi -F name -S available`  
do  
    diag -cd $i > /dev/null  
done  
#any registered "external notification" will be notified of errors  
#(such as HMC or Electronic Service Agent)  
-----
```

Note: On a partitioned system, it is only necessary to have the CRON job and script running on one partition associated with the enclosure, though it is acceptable to have the same CRON job and scripts on any partition associated with the enclosure.

Example 2

If the system the enclosure is attached to has neither an HMC nor is running Electronic Service Agent, create the file named "run_ses_healthcheck" in the /usr/lpp/diagnostics/bin directory, with the following contents:

```
-----  
#!/bin/ksh  
#Name:run_ses_healthcheck  
#Location:/usr/lpp/diagnostics/bin  
#Function: SCSI SES hourly heathcheck  
for i in `lsdev -Cc container -t ses -s scsi -F name -S available`  
do  
    diag -cd $i > /dev/null  
    if [ $? -ne 0 ]  
    then  
        /usr/lpp/diagnostics/bin/diagrpt -o >/tmp/ses.health.output  
        #you might want to process the output prior to placing it in  
        #a file  
        #somhow notify the user of the error. A sample is shown  
        #below.  
        mail -s "7031 Health Check" root</tmp/ses.health.output  
        rm /tmp/ses.health.output  
    fi  
done  
-----
```

Note: You can customize the actual notification in the script based on your preferences. These scripts send mail to root user if there are errors that need attention. You can modify the script if needed to inform certain users about the errors.

In both examples, once you have created the "run_ses_healthcheck" file, make it executable by typing (at AIX command prompt):

```
chmod 544 /usr/lpp/diagnostics/bin/run_ses_healthcheck.
```

Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment

Special considerations exist for connecting the disk-drive enclosure in a clustered environment. The information in this section will help you meet these considerations.

Before you begin

Having any planning and cabling documentation for the system you are attaching available during this process will make some parts of this process much easier.

About this task

To assure that the SCSI disk-drive enclosure is ready to be connected to the cluster complete the following steps.

1. Ensure that each SCSI device connected to the shared SCSI bus has a unique ID. A common configuration is to set the SCSI ID of the adapters on the nodes to be higher than the SCSI IDs of the shared devices. (Devices with higher IDs take precedence in SCSI bus contention.)
 - a. Use the command: `lscfg | grep scsi` to determine and record the logical name of each adapter. In the command output, the first column lists the logical name of the SCSI adapter, such as + SCSI0.
 - b. Use the `lscfg -vpl` command and logical name of the adapter to record the I/O slot (physical slot) that each SCSI adapter uses. For example `lscfg -vpl scsi0` where `scsi0` is the logical name of the adapter.
 - c. Use the `lsattr` command, as in the following example to find the ID of the adapter `scsi0`:
`lsattr -E -l scsi0 | grep id`

Note: Do not use wildcard characters or full pathnames on the command line for the device name designation.

In the resulting output, the first column lists the attribute names. The integer to the right of the `id` attribute is the adapter SCSI ID:

If a SCSI adapter address conflict exists move on to the next step, if no conflict exists return to the connection page for the operating system of the system you are connecting.

2. Examine the cabling to see if the proper ports on the system are connected to the proper ports on the repeater cards on the disk-drive enclosure. For example if you are connecting the system using two host adapter cards and dual repeater cards as shown in the following figure you will want to connect the systems as follows.

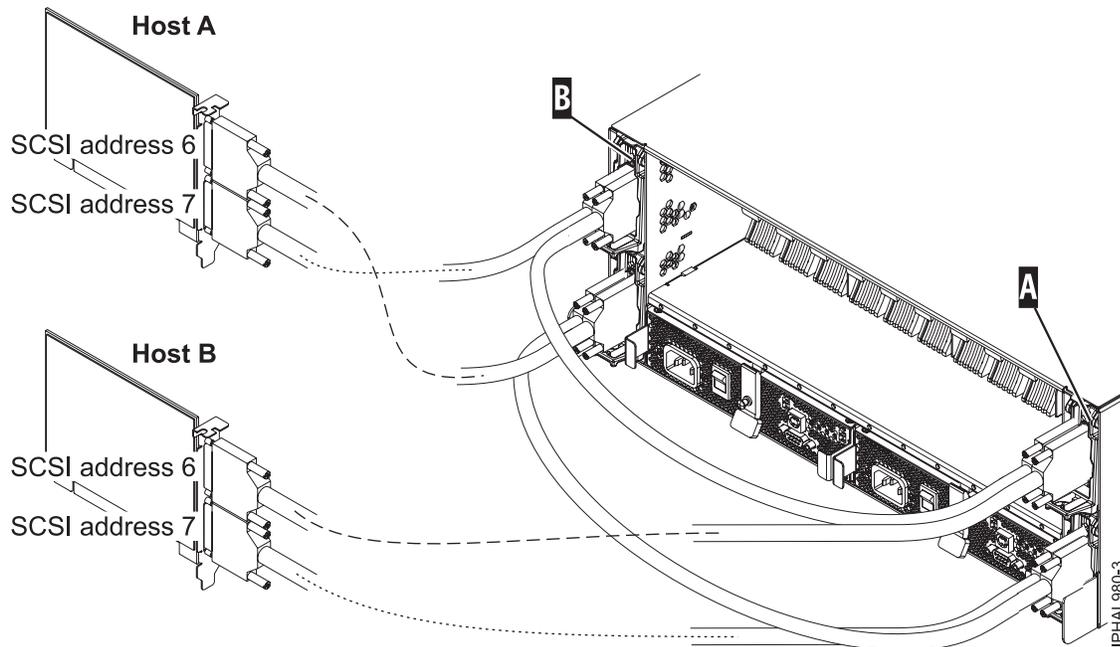


Figure 67. SCSI cable to dual repeater card connected with two SCSI cards

Cable the first SCSI bus or set of shared disks by doing the following:

- a. Connect the bottom port of the adapter on **Host A** (SCSI address 7) to the exterior port on the repeater card in slot C2 on the enclosure.
- b. Connect the top port of the adapter on **Host B** (SCSI address 6) to the exterior port on the repeater card in slot C3 on the enclosure.

This creates a set of shared disks and a shared SCSI bus (such as `scsi0`) between Host A and Host B. The important thing to consider at this point is that you connect the cables in descending order of the SCSI address on the host adapter. Connecting the cables in descending order of the Host SCSI address will reduce the potential for address conflicts.

Cable the second SCSI bus or set of shared disks by doing the following:

- a. Connect the bottom port of the adapter on **Host B** (SCSI address 7) to the interior port on the repeater card in slot C5 on the enclosure.
- b. Connect the top port of the adapter on **Host A** (SCSI address 6) to the interior port on the repeater card in slot C4 on the enclosure.

This creates a set of shared disks and a shared SCSI bus (such as `scsi1`) between Host A and Host B. The important thing to consider at this point is that this is an independent SCSI bus or set of shared disks from the first set. Ensuring that you do not mistakenly connect one of the cables from the either SCSI bus to another will reduce the potential for SCSI address conflicts.

Important: When adding, removing, or replacing SCSI adapters in Host systems you might want to disconnect the cabling at the enclosure first and reconnect the cabling to the enclosure last. This is because the new adapter may default to a SCSI ID of 7. You should ensure that the correct SCSI ID is set for the port you are cabling.

Connect and configure the disk drive enclosure in a system with the Linux operating system

Use the information in this section to understand the cabling, SCSI addressing, and post connection requirements for the disk-drive enclosure.

1. Install the initiator repeater cards into the disk drive enclosure. For instructions, see “SCSI repeater card” on page 71.

2. Connect the SCSI cable to your repeater card. Choose one of the following based on your situation:
 - If you are using only single repeater cards or only dual repeater cards, install your SCSI cable **A** to the initiator repeater card **B**. For more details, see Figure 68, Figure 69, Figure 70 on page 69, depending upon your situation.

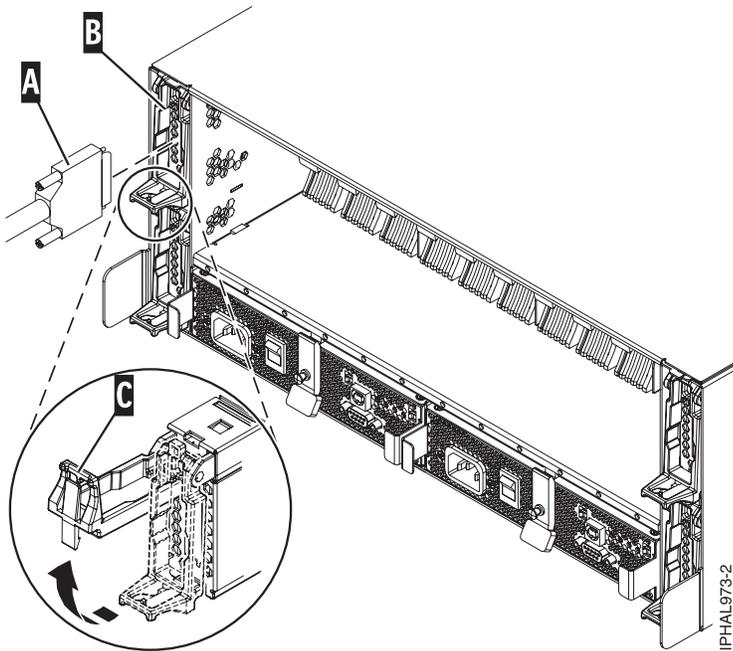


Figure 68. SCSI cable to single repeater card

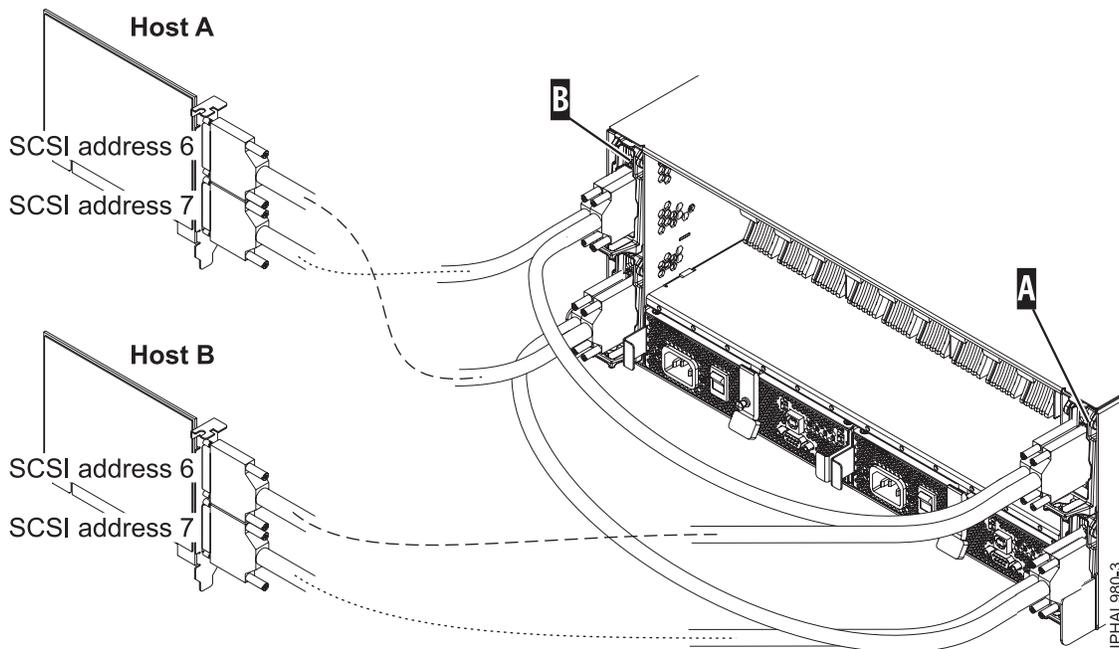
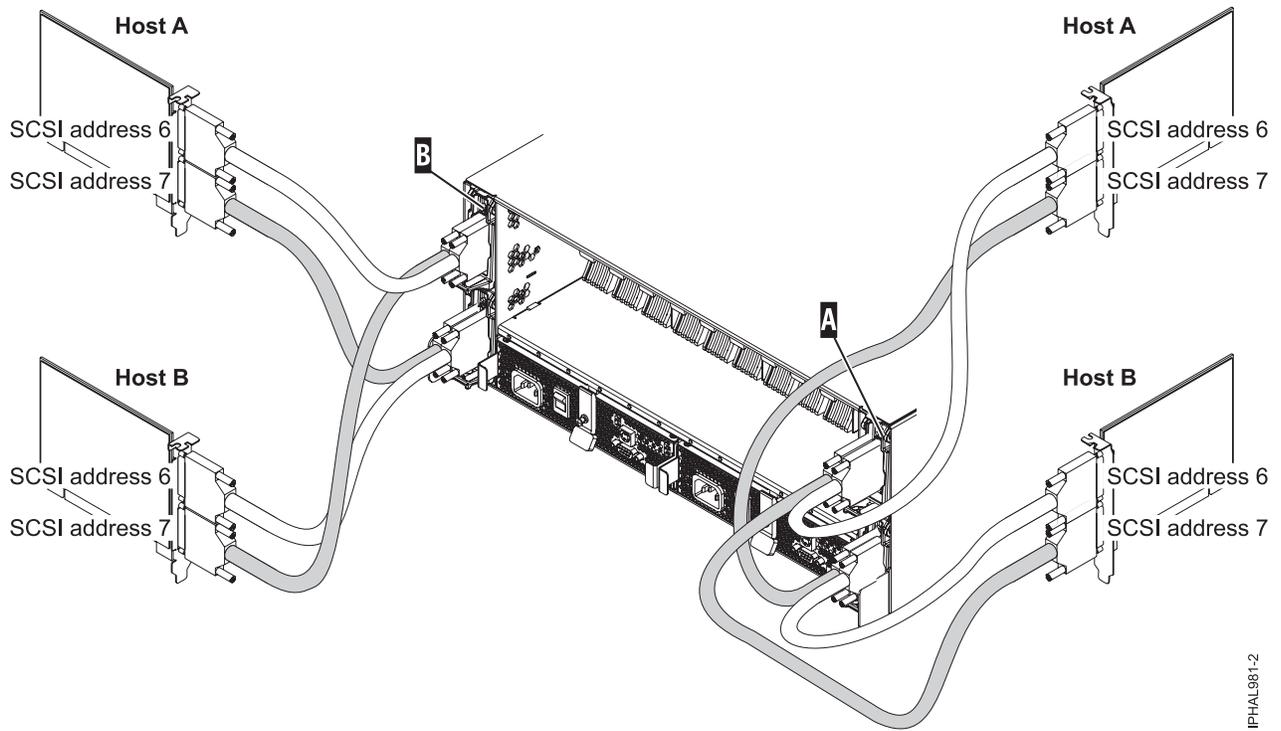


Figure 69. SCSI cable to dual repeater card connected with two SCSI cards



IPHAL981-2

Figure 70. SCSI cable to dual repeater card connected with four SCSI cards

- If you are using a combination of single and dual repeater cards, install a SCSI cable to the dual initiator repeater card **A**. Then, connect the dual repeater card **A** to the single repeater card **B** with a different SCSI cable. For more information, see Figure 71 on page 70.

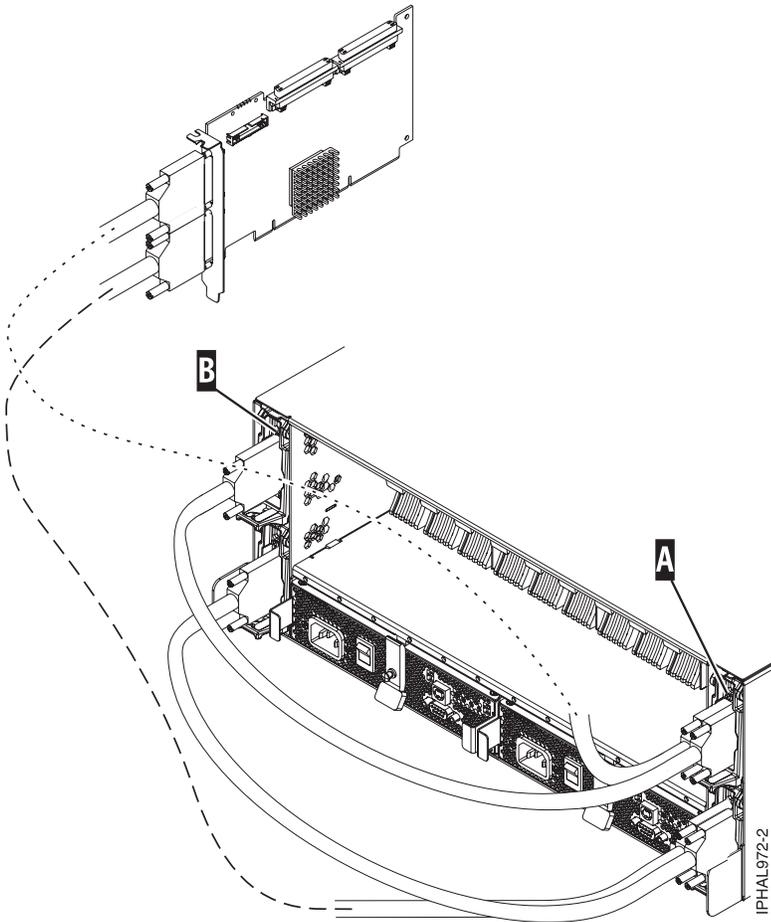


Figure 71. SCSI cable to dual repeater card connected to single repeater card

3. Install the other end of the SCSI cable C to the SCSI adapter D on the server. For more details, see Figure 72.

Important: The SCSI adapter or the system or partition must be powered off before making this connection.

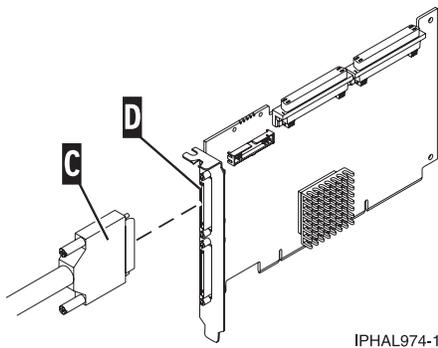


Figure 72. SCSI cable to SCSI interface card

4. Set up the Linux CRON job during the initial installation of your SCSI disk-drive enclosure. Perform the following tasks to ensure that your Linux CRON job is setup.
 - a. Install the following RPMs from Service and productivity tools (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiaigs/home.html>).

- librtas
 - lsvpd
 - ppc64-utils
 - diagela
- b. If your partitions are managed by a Hardware Management Console (HMC), install the `src`, `rsct.core.utils`, `rsct.core`, `csn.core`, `csn.client`, and `devices.chrp.base.ServiceRM` packages in order to report errors to the Service Focal Point on the attached HMC. Instructions for installing the packages are located on the Web site listed previously.

Note: Errors on hard disks within the enclosure will not be found using this CRON job. This diagnostic is limited to reporting errors with the fans, power supplies, VPD card, and repeater in the enclosure.

- c. Add a CRON job to execute enclosure diagnostics to the system CRON table. As root, edit the system CRON by running `crontab -e`. At the bottom of that file, enter:

```
* 3 * * * /usr/sbin/diag_encl -s 1>/dev/null 2>&1
```

- d. Adding this line causes the diagnostic application `/usr/sbin/diag_encl` to be run daily at 3:00 a.m. The `diag_encl` diagnostic application will read the contents of the `/etc/diagela/diagela.config` file to determine what applications have been registered to be notified of errors. To add additional notification methods or for more information, see that file. By default, the following notifications will occur.
- The Service Focal Point on the HMC will be notified if the system is managed by an HMC. If the system is not managed by an HMC, the root group will be notified.
 - If the system has Electronic Service Agent installed, it will be notified.
 - The error details will be printed to the console, to the end of the `/var/log/platform` log file, and to the `syslog` (`/var/log/messages`).

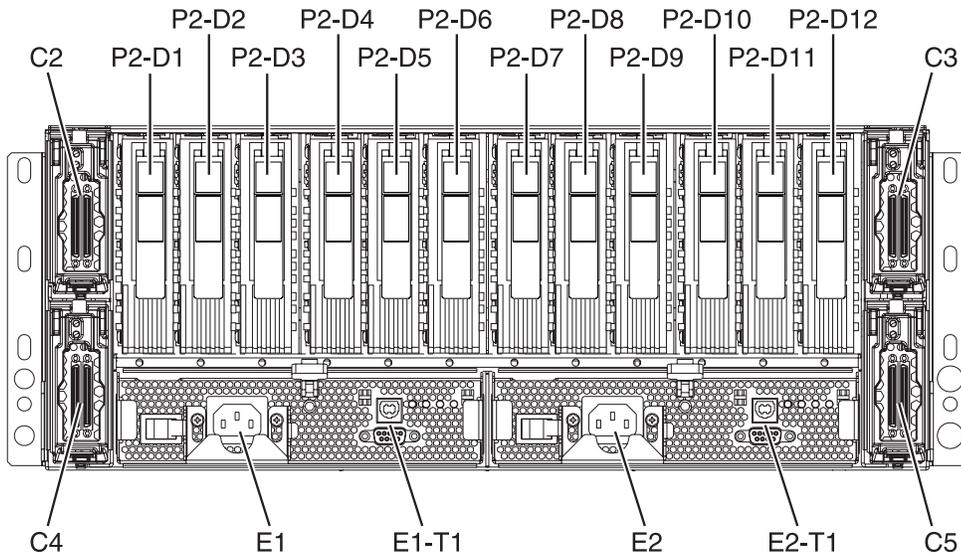
Notes:

- On a partitioned system, it is only necessary to have the CRON job on one partition associated with the enclosure. However, it is acceptable to have the same CRON job on all partitions.
- `/usr/sbin/diag_encl` might run at any time to diagnose enclosures attached to the system.

SCSI repeater card

Use this information to understand where to place your repeater card and how to install your repeater card.

Use the following figure and instructions to place your repeater cards.



IPHAL971-0

Figure 73. Repeater card location of the and 31D/24 SCSI disk-drive enclosure (drawer models)

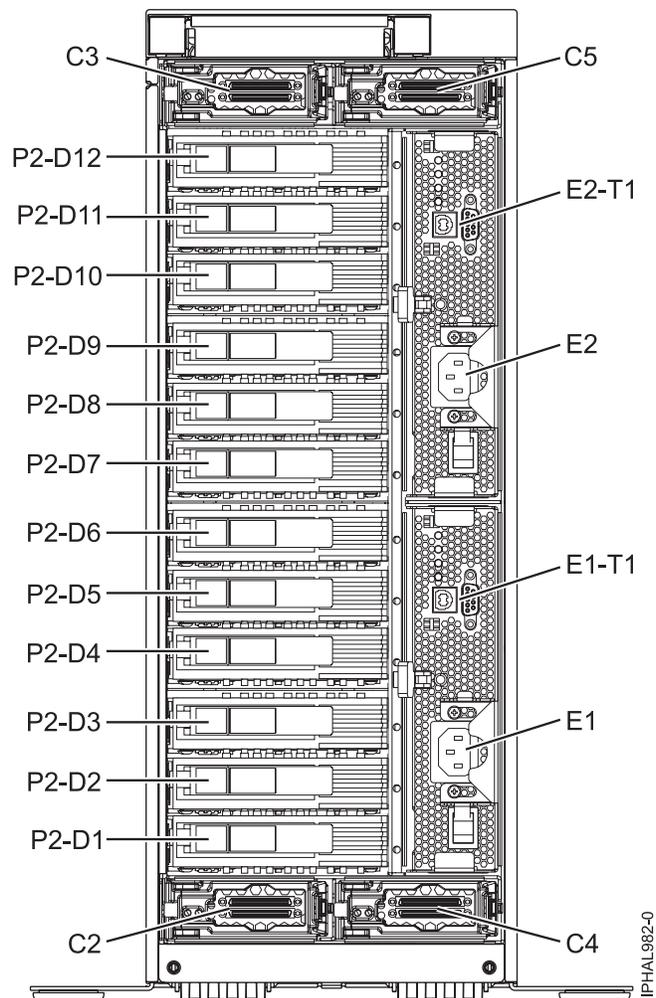


Figure 74. Repeater card location of the and 31T/24 SCSI disk-drive enclosure (stand-alone models)

If you only have dual repeater cards, place as follows:

Important: On stand-alone models, the locations C3 and C5 are located on top, C2 and C4 are located on the bottom. Follow the location codes when placing repeater cards.

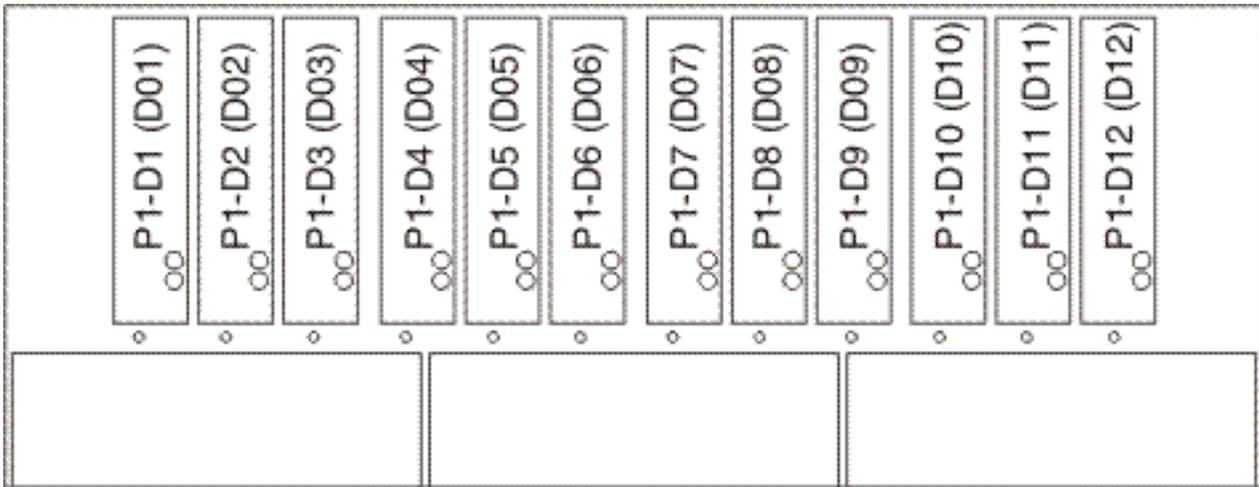
Table 1. Repeater card placement for single and dual style frepeater cards

Type and number of repeater cards	Single repeater card placement	Dual repeater card placement
1 single repeater card and 0 dual repeater cards	C5	
2 single repeater cards and 0 dual repeater cards	Place in order C5 then C2	
3 single repeater cards and 0 dual repeater cards	Place in order C5, C2, then C4	
4 single repeater cards and 0 dual repeater cards	Place in order C5, C2, C4 then C3	
1 single repeater card and 1 dual repeater card	Place in C5 first then place dual repeater card	C4
1 single repeater card and 2 dual repeater cards	Place in C5 first then place dual repeater card	Place in order C4 then C3

Table 1. Repeater card placement for single and dual style frepeater cards (continued)

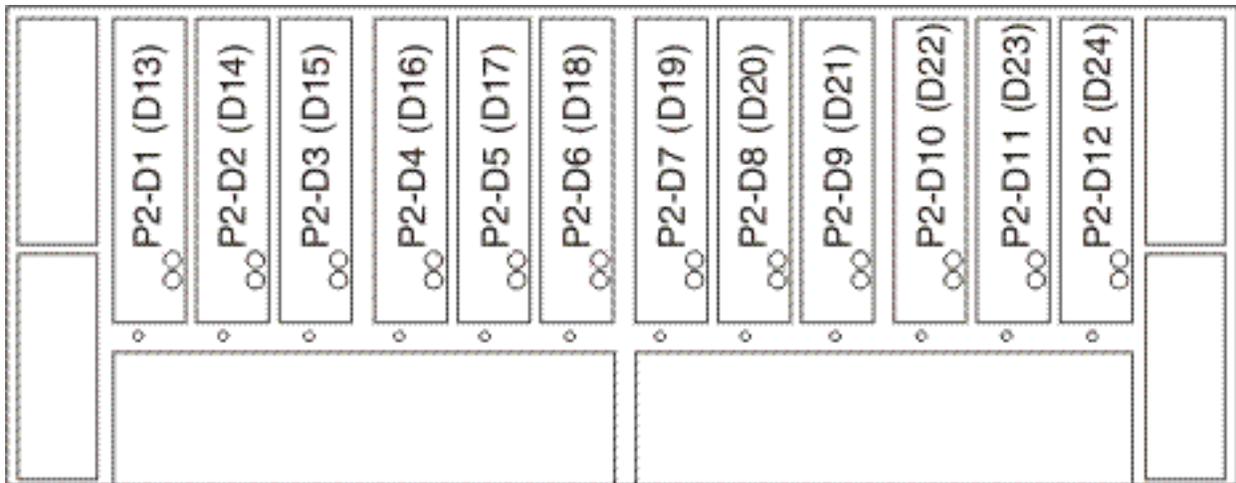
Type and number of repeater cards	Single repeater card placement	Dual repeater card placement
2 single repeater cards and 1 dual repeater cards	Place in C5 then C2 then place dual repeater card	C4
2 single repeater cards and 2 dual repeater cards	Place in C5 then C2 then place dual repeater card	Place in order C4 then C3
0 single repeater cards and 1 dual repeater card		C4
0 single repeater cards and 2 dual repeater cards		Place in order C4 then C5
0 single repeater card and 3 dual repeater cards		Place in order C4, C5, then C3
0 single repeater card and 4 dual repeater cards Restriction: This configuration is for servers models only.		Place in order C4, C5, C3, then C2

The following figures show the locations of the disk drives for the front and back of the 31D/24 or 31T/24 SCSI disk-drive enclosure.



IPHAL975-0

Figure 75. Front view of 31D/24 or 31T/24 SCSI disk-drive enclosure



IPHAL976-0

Figure 76. Back view of 31D/24 or 31T/24 SCSI disk-drive enclosure

The following list describes how the repeater card locations affect the disk drive bays.

- The top left repeater card (C2) drives the front right 6 bays (D07 to D12). Figure 75 on page 74
- The top right repeater card (C3) drives the front left 6 bays (D01 to D06). Figure 75 on page 74
- The bottom left repeater card (C4) drives the back left 6 bays (D13 to D18). Figure 76
- The bottom right repeater card (C5) drives the back right 6 bays (D19 to D24). Figure 76

To install your repeater card, complete the following steps:

1. Remove the filler from the repeater card slot.
2. Install your new repeater card.

Remove and replace SCSI repeater card

You might need to remove and replace one of the Small Computer System Interface (SCSI) repeater cards to repair a failing device or as a part of another service action.

Before you begin

Before you remove and replace an SCSI repeater card, follow the instructions for your operating system to save any jobs.

Restriction: You must replace the repeater card with the same type of card to continue. If you are changing card configurations from single to dual stop here and follow the instructions in “Connect the 31D/24, or 31T/24 to a system with the AIX operating system” on page 62 or “Connect and configure the disk drive enclosure in a system with the Linux operating system” on page 67.

About this task

The disk drive enclosure SCSI repeater card can be removed and replaced with the system and enclosure power on. To avoid errors, you can power off the adapter that connects the disk drive enclosure to your system. For details, refer to the Hardware Information Web site at add URL here  and find the PCI adapters guide for your model.

1. Locate the repeater card you are replacing. For instructions see “Service Action Log (SAL)” on page 109.
2. Remove the cable **A** from the repeater card **B**.

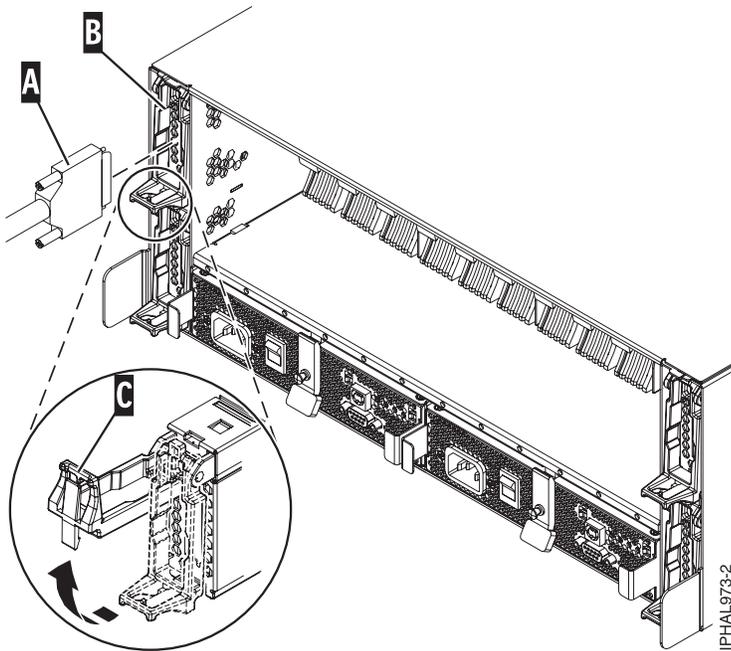


Figure 77. Removing SCSI cable from repeater card

3. Lift the handle C to unseat the repeater card from the enclosure.
4. Pull the repeater card out of the enclosure.
5. Align the replacement repeater card with the empty slot on the enclosure, and insert the card until it is firmly seated.
6. Lower the handle to secure the repeater card into place.
7. Reattach the cable to the repeater card.
8. Restart the adapter. For instructions, see [Managing PCI adapters](#). To view the PDF file of [Managing PCI adapters](#), approximately 4 MB in size, see [oemiphcd.pdf](#) 

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 models :

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 models

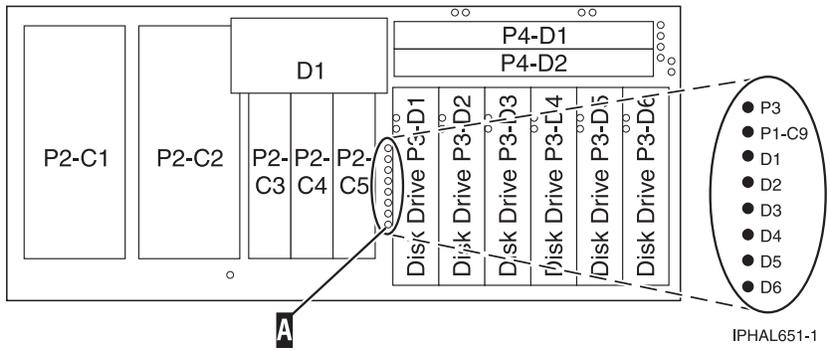


Figure 78. Model disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for 11D/20:

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 model 11D/20.

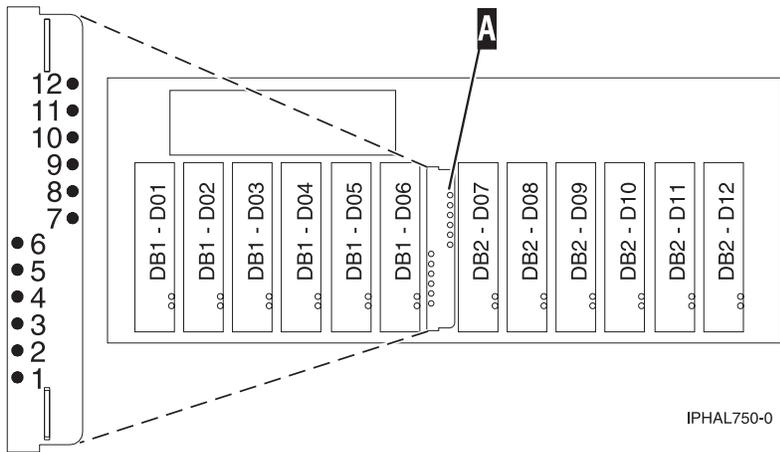


Figure 79. Model 11D/20 disk-drive concurrent maintenance lights

Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 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 models 31D/24 or 31T/24 SCSI disk-drive enclosure.

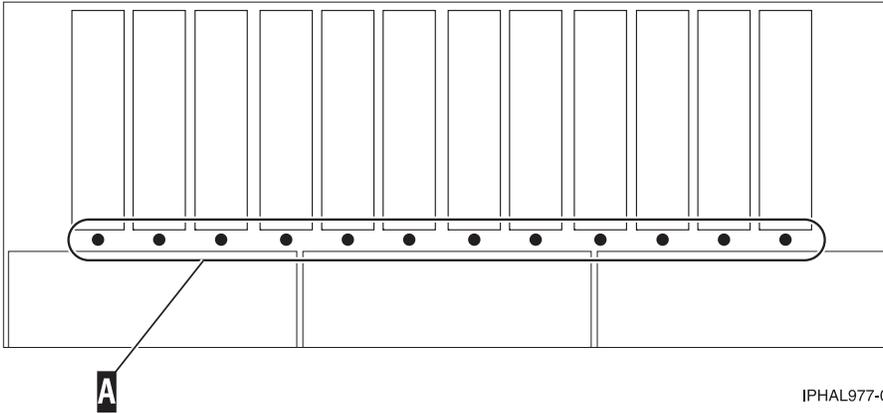


Figure 80. Front view of model 31D/24 or 31T/24 SCSI disk-drive enclosure concurrent maintenance lights

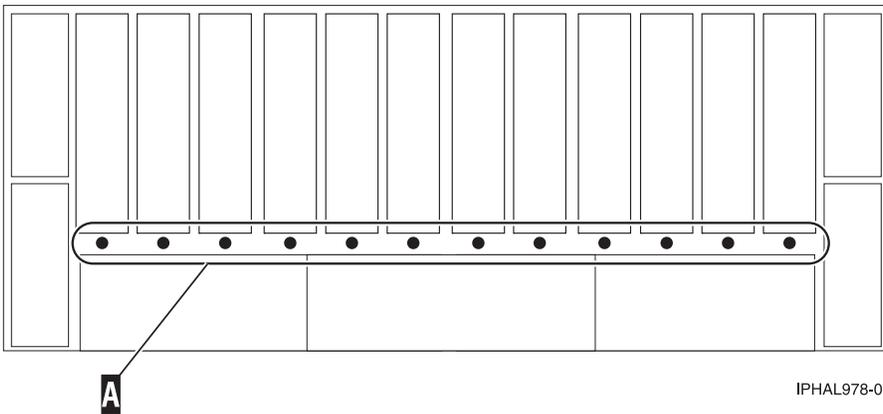


Figure 81. Back view of model 31D/24 or 31T/24 SCSI disk-drive enclosure concurrent maintenance lights

Disk-drive concurrent maintenance lights for 58/86 disk-drive enclosure:

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 lights for the 58/86 disk-drive enclosure.

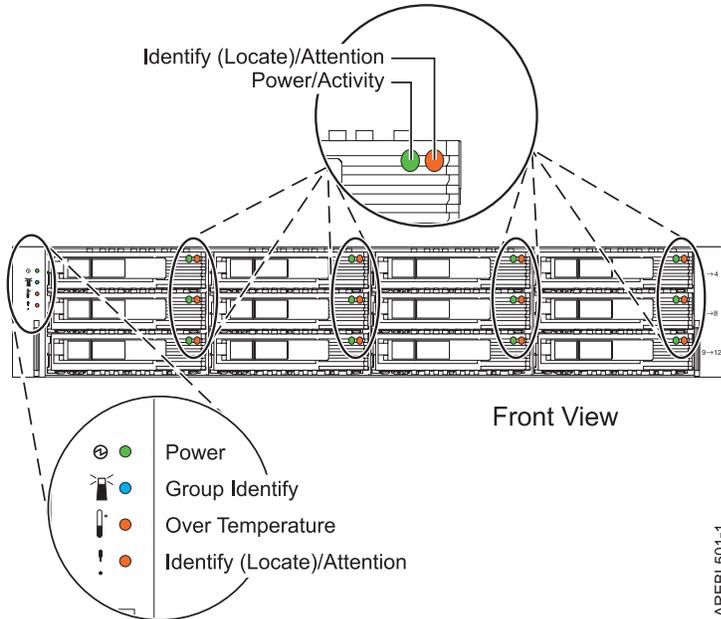


Figure 82. Front view of 58/86 disk-drive enclosure concurrent maintenance lights

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

Configure the newly installed disk drive for your environment.

About this task

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.

About this task

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.

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.

About this task

- 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*.

Rebuild data on a replacement disk drive using Linux

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

About this task

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.

Results

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

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.

About this task

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*.

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 83. 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 84. 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.

Rebuild data on a disk drive using Linux kernel 2.6:

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

About this task

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*.

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 Configuration Utility display is shown.
3. Select **Work with disk unit recovery** from the Configuration Utility display. Press Enter. 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 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 85. 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 86. 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.

Disk drive backplane

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

Remove the disk drive backplane

You might need to remove the disk drive backplane from the server. Use the procedure in this section to perform this task.

About this task

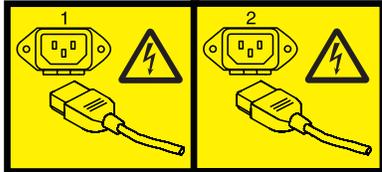
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing the disk drive backplane from the server. For instructions, see “Exchange a part using the Hardware Management Console” on page 150. If you do not have an HMC, complete the following steps to remove the disk drive backplane:

1. Perform the prerequisite tasks described in “Before you begin” on page 101.

2. If you are removing the disk drive backplane for a system upgrade or as part of another procedure, continue to the next step. If you are removing the disk drive backplane because of a system failure, use the service action log to help identify the failing part, see “Service Action Log (SAL)” on page 109.
3. Stop the system. For instructions, see “Stop a system or logical partition” on page 116.
4. 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

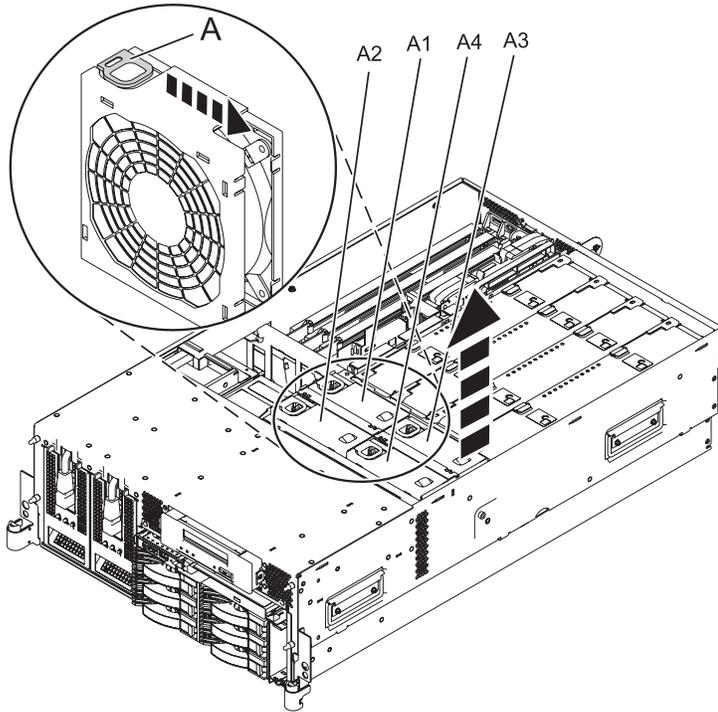


5. Remove the front cover, see “Removing the front cover from a rack mounted model 03E/4A, 04E/8A” on page 133 or “Remove the front cover from the stand-alone model 03E/4A, 04E/8A” on page 135.

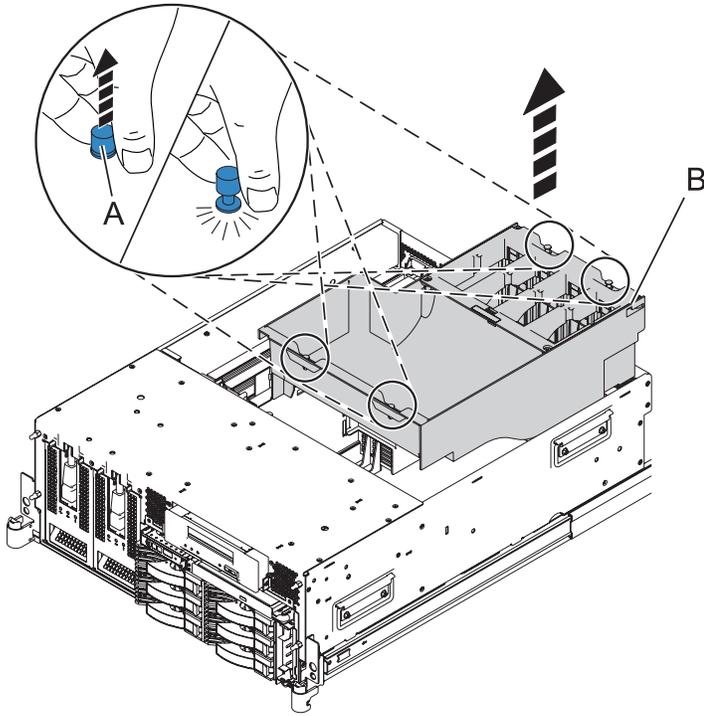
Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) 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. Place the system into the service position, see “Placing a rack-mounted model 03E/4A, 04E/8A in the service position” on page 144.

7. Remove the service access cover, see “Removing the service access cover from a rack-mounted model 03E/4A, 04E/8A” on page 129 or “Removing the service access cover from a stand-alone model 03E/4A, 04E/8A” on page 131
8. Remove the fans or the air flow cover by doing one of the following:
 - a. Remove the fan by squeezing the tab **A** and lifting it out of the system as shown in the following figure

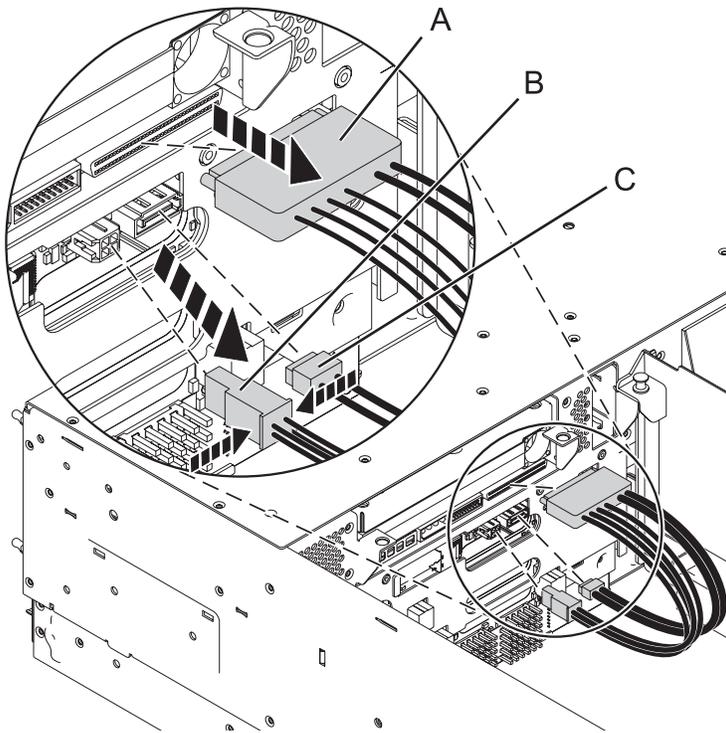


- b. Remove the air flow cover **B** by lifting each of the four tabs **A** to release the cover, and lift the cover from the system, as shown in the following figure.



9. Disconnect the cables from the back of the disk drive backplane, as shown in the following figure.

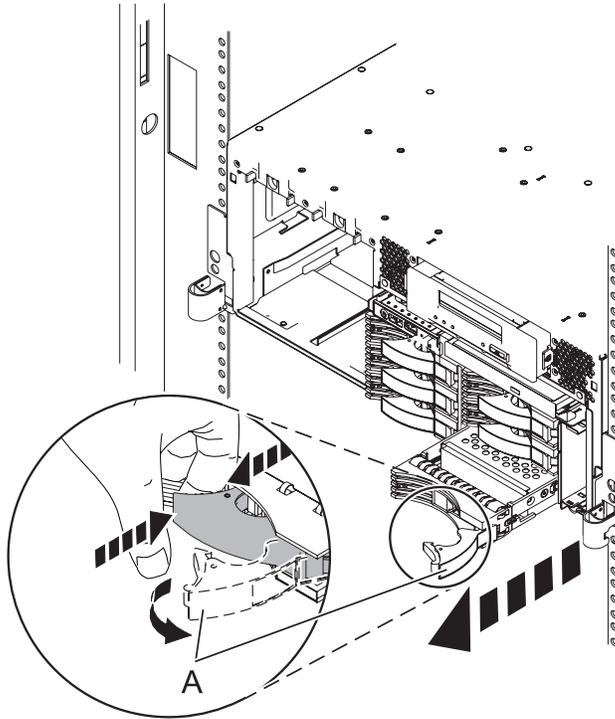
Note: Ensure you have disconnected all cables from the backplane. Some of the cables might not be shown in the following figure.



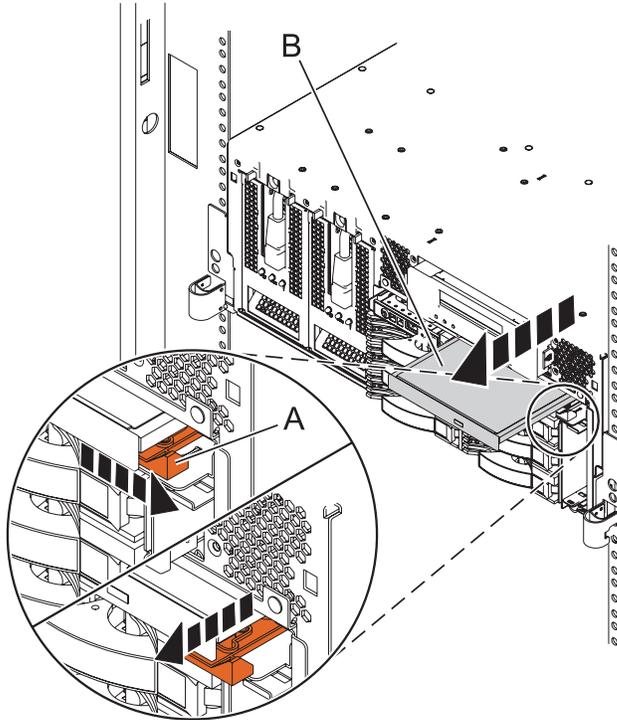
10. Remove the disk drives from the backplane if you need to replace the backplane because of an upgrade or system failure.

Note: You might also choose to remove the backplane with the disk drives populated. If you do so it will be heavy ensure you can safely complete the procedure.

- a. Lift the lever **A** to unseat the disk drive.
- b. Place one hand under the disk drive and carefully pull the drive out of the system as shown in the following figure.



11. Remove the media device by pressing in on the latch **A** and sliding the media device out of the system, as shown in the following figure.



12. Unlock the disk drive backplane by pulling the handles open from the center of the backplane, as shown in the following figure.
13. Pull the backplane out of the server, as shown in the following figure.

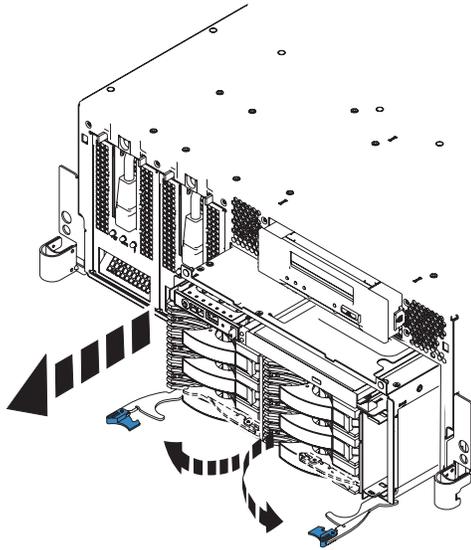
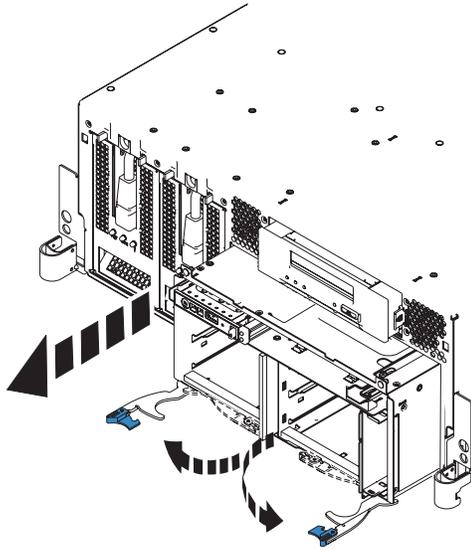


Figure 87. Removing the disk drive backplane

14. If you removed the backplane as a part of another procedure continue with that procedure. To replace the backplane or install a new backplane see “Replace disk drive backplane.”

Replace disk drive backplane

If you removed the disk drive backplane as a part of another procedure, you might need to use the procedure in this section to replace the disk drive backplane.

Before you begin

To remove the disk drive backplane, see “Remove the disk drive backplane” on page 82.

About this task

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing the disk drive backplane in the server. For instructions, see “Exchange a part using the Hardware Management Console” on page 150. If you do not have an HMC, complete the following steps to replace the disk drive backplane:

1. Perform the prerequisite tasks described in “Before you begin” on page 101.
2. Carefully lift the backplane along two sides and align with the slot in the server.

Important: Replacing the backplane populated with disk drives will be heavy. Ensure you can safely perform this task before you begin.

3. Insert the backplane firmly into the server, as shown in the following figure.
4. Secure the backplane with the locking tabs.

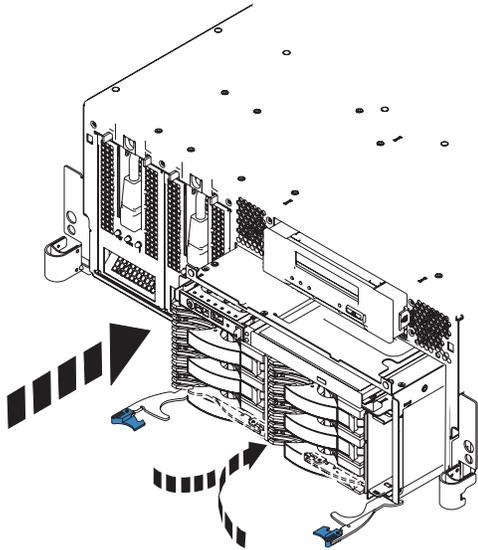
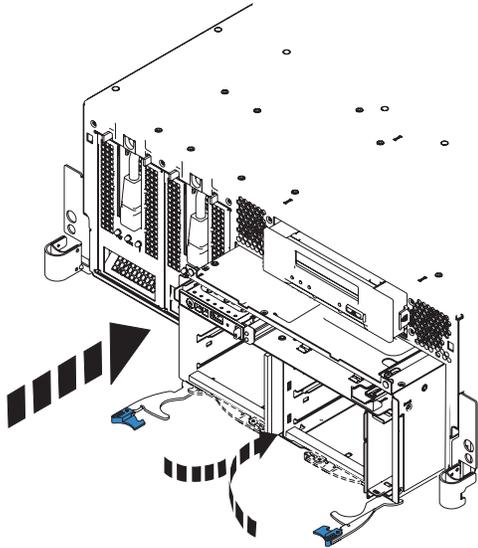
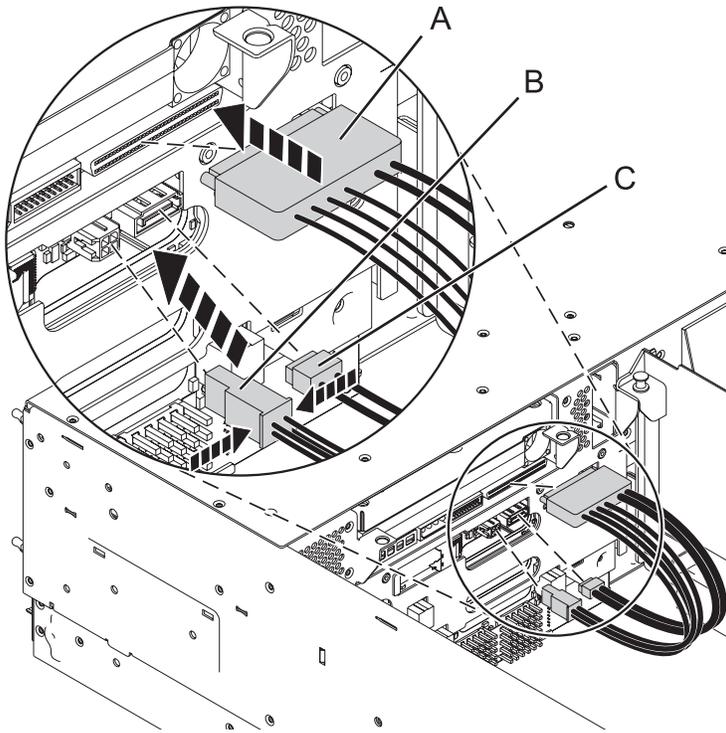


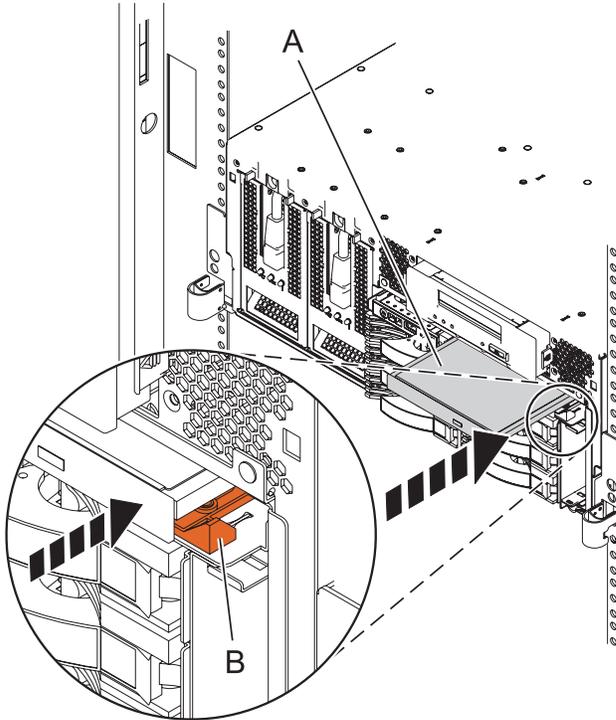
Figure 88. Install the disk drive backplane on a rack mounted model

5. Connect cables to backplane, as shown in the following figure.

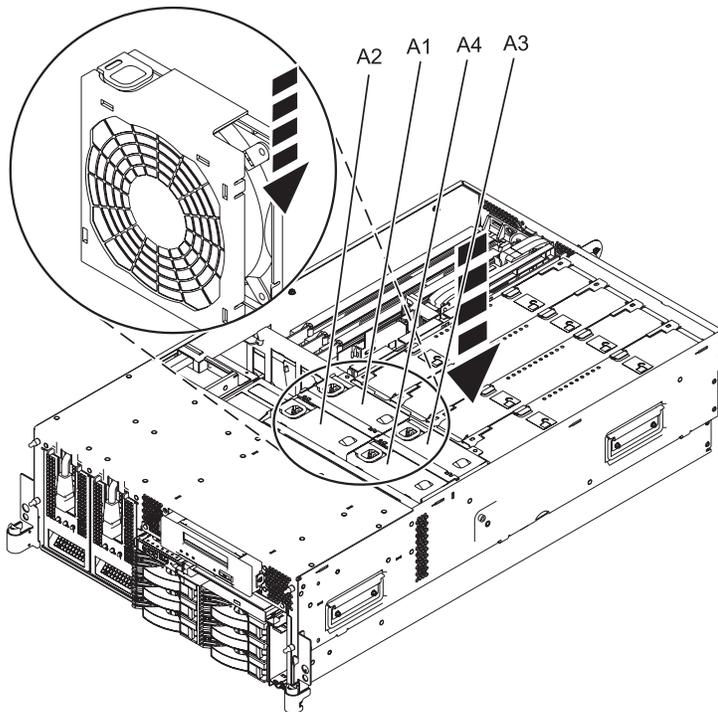
Note: Ensure that you connect any additional cables not shown in the figure.



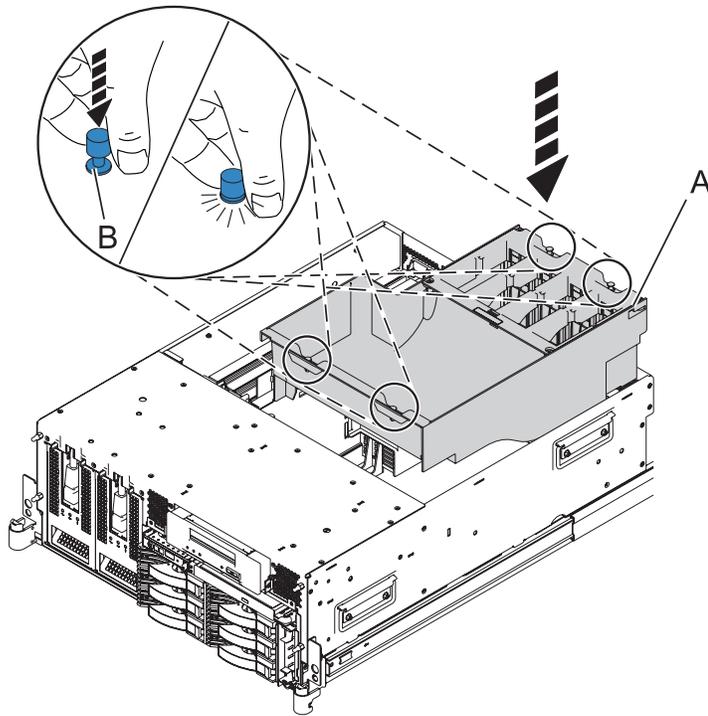
6. Replace the disk drives if you removed them earlier.
 - a. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
 - b. Slide the disk drive all the way in into the system or expansion unit and then lock it in place by pushing in the disk drive handle.
7. Replace the Slimline media device by inserting it into the slot and pushing it in until the lever **B** locks into place, as shown in the following graphic



8. Replace the fans or air baffle by doing one of the following:
 - a. Replace the fans by inserting them into place until they lock into place, as shown in the following graphic



- b. Replace the air baffle by inserting the baffle into place and pushing each of the locking tabs down to secure the baffle, as shown in the following figure.



9. Replace service access cover, see “Install the service access cover on a rack-mounted model 03E/4A, 04E/8A” on page 130.
10. Replace the front cover, see “Installing the front cover on the rack-mounted model 03E/4A, 04E/8A” on page 134 or see “Installing the front cover on a stand-alone model 03E/4A, 04E/8A” on page 136.
11. Place the system in the operating position, for rack mounted models see “Placing the rack-mounted 03E/4A, 04E/8A in the operating position” on page 147.
12. Start the system, see “Start the system or logical partition” on page 112.
13. Verify the installed part. For instructions, see “Hardware Service Manager — Verify” on page 150.

Internal DASD sharing on model 04E/8A, 03E/4A

You might need to cable and understand the function of this feature. Use the following information to complete these tasks.

Before you begin

The following information is for use after the adapter is installed. Instal the adapter and then return here.

For more information on installing the adapter, see the To view the PDF file of PCI adapters, approximately 40 MB in size, see [oemiphak.pdf](#) .

You should also review the tasks in “Before you begin” on page 101 if you have not already done so.

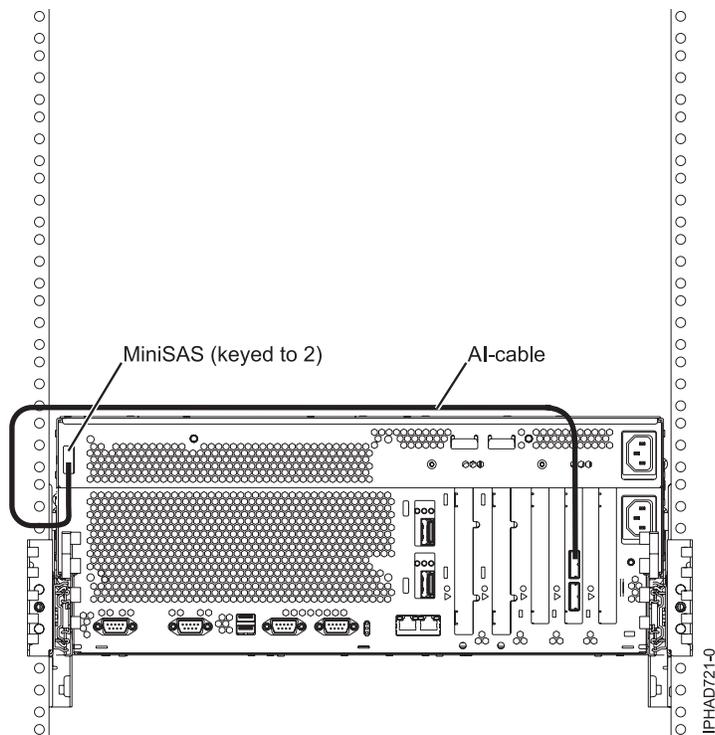
About this task

This feature allows you to split the internal disks in the system unit enclosure into groups which you can manage separately.

1. Stop and power off the system if it is not already, see “Stop a system or logical partition” on page 116.
2. Cable the system by connecting the SAS cable to the adapter and then to the internal SAS connection, as shown in the following graphic.

Important: This configuration is not supported with backplane feature code 8341.

Note: Internal cable FC3670 for model 03E/4A or FC3669 for model 04E/8A must be installed to enable this configuration.



Notes:

- Internal cable FC3670 for model 03E/4A or FC3669 for model 04E/8A must be installed to enable this configuration.
- The second connector on the adapter can be used to attach a disk expansion or media expansion drawer.

Figure 89. SAS adapter to internal SAS disk slots through the system external SAS port

3. Start the system, see “Start the system or logical partition” on page 112.
4. Verify the feature is installed and working, see “Hardware Service Manager — Verify” on page 150.

Example

Depending on the feature you ordered, either 3 or 6 of the disks in the system enclosure will be managed by the SAS Storage Controller adapter.

What to do next

Now, you can manage the disks as you would manage any other disks.

Feature 3650 or 3651

You might need to cable and understand the function of this feature. Use the following information to complete these tasks.

Before you begin

The following information is for use after the adapter is installed. Install the adapter and then return here.

For more information on installing the adapter, see the Hardware Information Web site at add URL here

 . Select **Library** → **POWER6 based processors** → **PCI adapters**.

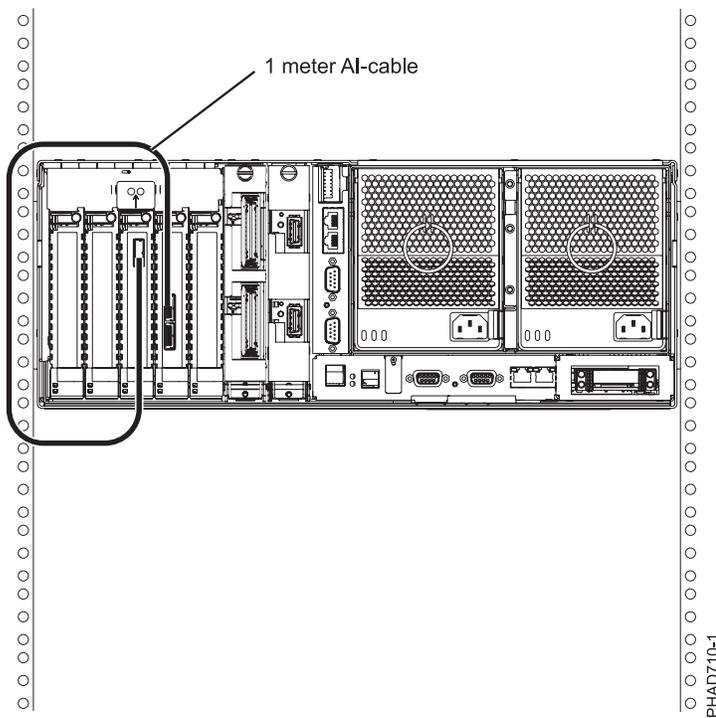
You should also review the tasks in “Before you begin” on page 101 if you have not already done so.

About this task

This feature allows you to split the internal disks in the system unit enclosure into groups which you can manage separately.

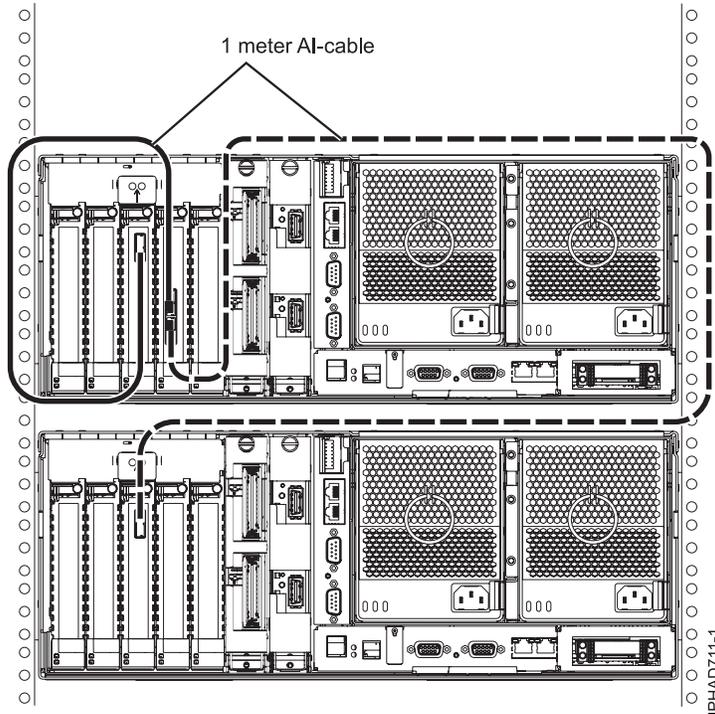
1. Stop and power off the system if it is not already, see “Stop a system or logical partition” on page 116.
2. Cable a single system unit enclosure by doing the following:
 - a. Attach the cable to the single port on the on the FC3650 or FC3651 in slot 3 to the top port in the FC5900 SAS Storage Controller as shown in the following figure.

Restriction: The FC3650 or FC3651 must be in slot 3 so that it connects to the DASD backplane in the system. The FC5900 SAS Storage Controller may be in any of the other slots that support it.



- b. Secure any extra cable.
 - c. Skip to step 4 on page 96.
3. Cable a two enclosure system by doing the following:
 - a. Attach the cable to the single FC3650 or FC3651 card in slot 3 to the top port in the FC5900 SAS Storage Controller, as shown in the following figure.

Restriction: Each FC3650 or FC3651 must be in slot 3 so that it connects to the DASD backplane in the system. The FC5900 SAS Storage Controller be in any of the other slots that support it in either system enclosure.



- b. Connect the second cable from the bottom port on the FC5900 SAS Storage Controller to the FC3650 or FC3651 card in slot 3 in the second drawer, as shown in the previous figure.
 - c. Secure any extra cable.
 - d. Move on to step 4.
4. Start the system, see “Start the system or logical partition” on page 112.
 5. Verify the feature is installed and working, see “Hardware Service Manager — Verify” on page 150.

Example

Depending on the feature you ordered, either 3 or 6 of the disks in the system enclosure will be managed by the SAS Storage Controller adapter. This applies to both configurations.

- FC3650: SAS PCI Storage adapter controls internal disk slots 4,5,6 and the SAS embedded planar storage controller controls internal disk slots 1,2,3 and the Removable Media devices.
- FC3651: SAS PCI Storage adapter controls all internal disk slots 1,2,3,4,5,6 and the SAS embedded planar storage controller controls only the Removable Media devices.

What to do next

Now, you can manage the disks as you would manage any other disks.

Installing the external SAS port on a model 03E/4A, , or

You might need to install an external SAS port as a part of upgrading your disk-drive backplane, or enabling internal disk drive sharing. Use the procedure in this section to perform this task.

About this task

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing the SAS feature 3699 into the server. For instructions, see “Removing a part using the

Hardware Management Console” on page 149. If you do not have an HMC, complete the following steps to install the SAS feature 3699 into the server:

1. Complete the instructions for removing the DASD backplane. For instructions see “Remove the disk drive backplane” on page 82.
2. Perform the prerequisite tasks described in “Before you begin” on page 101.
3. Align the SAS cable assembly with the side of the system. Ensure the external port is facing the back of the system and the tab on the side of the assembly is facing the side of the system.
4. Insert the port through the back of the system.
5. Insert the tab on the SAS cable assembly into the slot on the side of the system.
6. To replace the backplane or install a new backplane see “Replace disk drive backplane” on page 88.

Installing the external SAS port on a model 04E/8A or

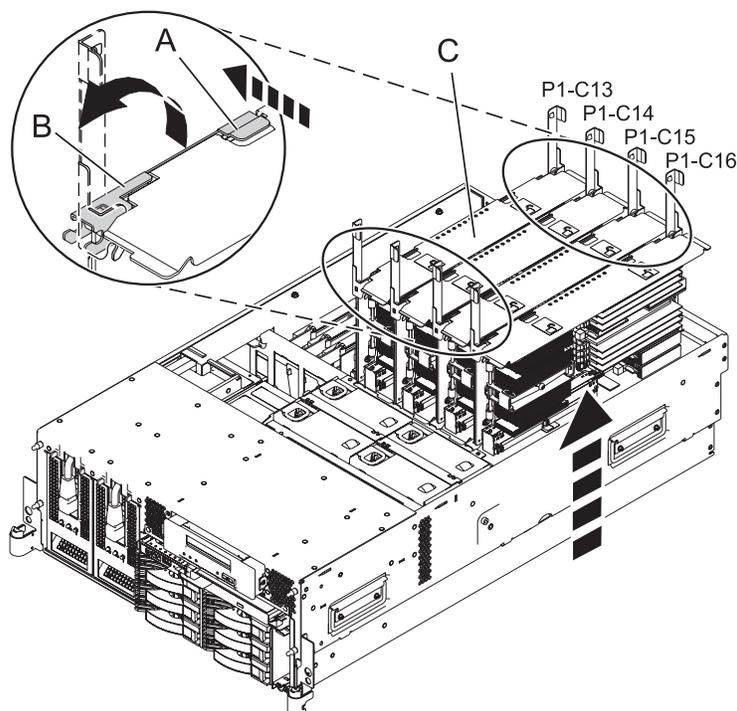
You might need to install an external SAS port as a part of upgrading your disk-drive backplane, or to enable internal disk sharing. Use the procedure in this section to perform this task.

About this task

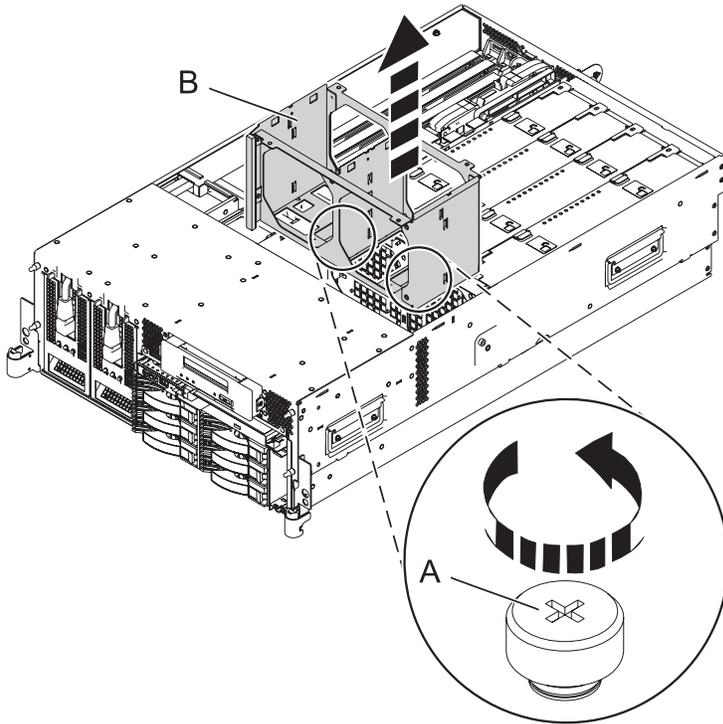
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps to install the SAS feature 3699 into the server. For instructions, see “Removing a part using the Hardware Management Console” on page 149. If you do not have an HMC, complete the following steps to install the SAS feature 3699 into the server:

1. Complete the instructions for removing the DASD backplane. For instructions see “Remove the disk drive backplane” on page 82.
2. Perform the prerequisite tasks described in “Before you begin” on page 101.
3. Remove the system processor assembly or filler in position P1-C16 by lifting the handle A and lifting the assembly out of the system, as shown in the following figure.

Note: You only need to remove the one assembly or filler in P1-C16. To remove a filler simply grasp the filler in the center and lift the filler out of the system.

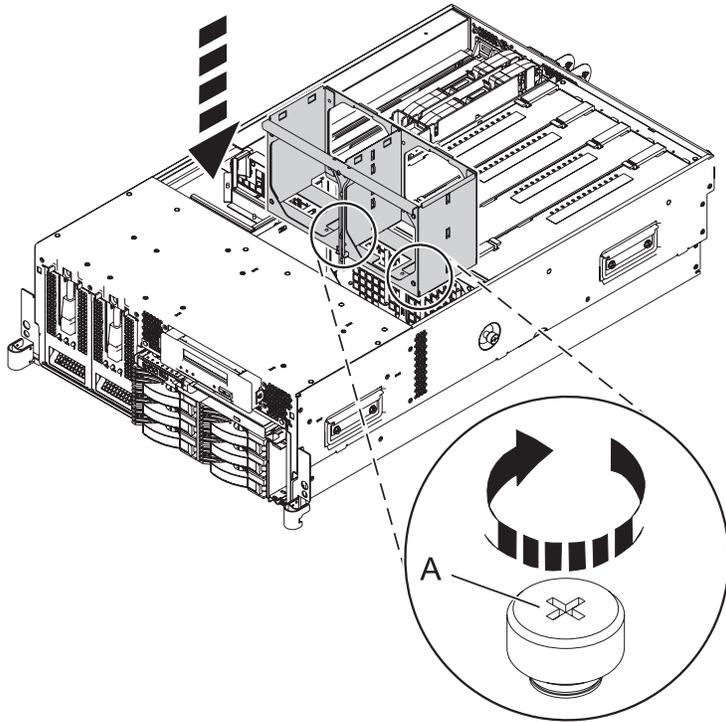


- Remove the fan cage by turning the thumbscrews **A** to release the cage, **B** then lift the cage out of the system as shown in the following figure.

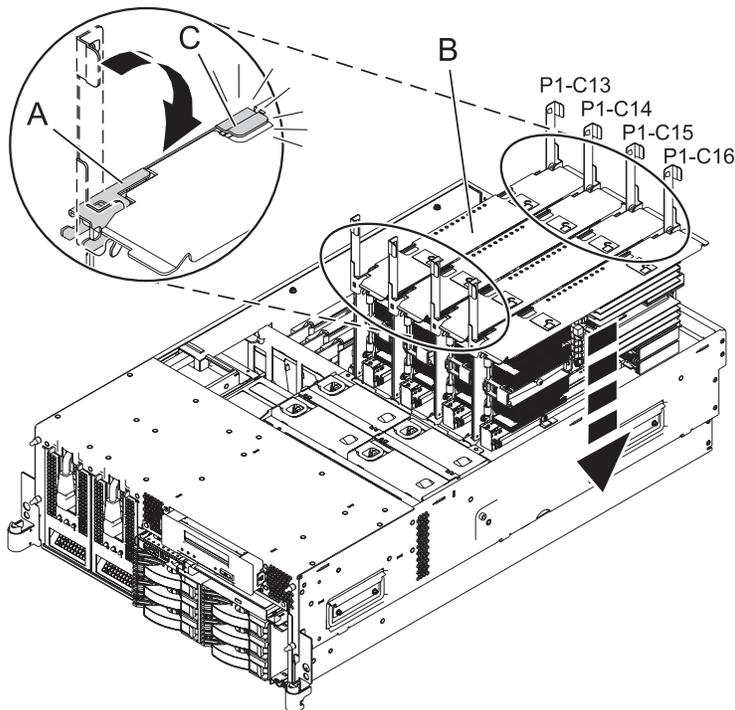


- Align the SAS cable assembly with the side of the system. Ensure the external port is facing the back of the system and the tab on the side of the assembly is facing the side of the system.
- Insert the port through the back of the system.
- Insert the tab on the SAS cable assembly into the slot on the side of the system.
- Replace the fan cage **A** and secure the thumbscrews **B**, as shown in the following figure.

Important: Be sure that the exposed part of the SAS cable assembly and the connector are in front of the fan cage.



9. Install the system processor **B** and secure both latches **C** as shown in the following figure.



10. To replace the backplane or install a new backplane see “Replace disk drive backplane” on page 88.

Chapter 2. Common Procedures

This section contains all the common procedures related to installing, removing and replacing features.

Before you begin

Understand prerequisites for installing, removing, or replacing features and parts.

About 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 provided power cord. Do not use the 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.

(D005a)

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.
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).
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.
7. If you encounter difficulties during the installation, contact your service provider, 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 details, see the Logical partitioning and then return to these instructions. To view the PDF file of Logical partitioning, approximately 3 MB in size, see

oemiphat.pdf 

Managing the Advanced System Management Interface

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power.

The ASMI might also be referred to as the service processor menus.

Accessing the ASMI without an HMC

You can access the ASMI through a Web browser or an ASCII terminal.

Accessing the ASMI using a PC and Web browser

Connect a PC or mobile computer to the server to access the Advanced System Management Interface (ASMI). The Web interface to the ASMI is available during all phases of system operation including the initial program load (IPL) and run time.

About this task

The Web interface to the ASMI is accessible through Microsoft® Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 running on a PC or mobile computer connected to the service processor. The Web interface is available during all phases of system operation including the initial program load (IPL) and run time. However, some of the menu options in the Web interface are unavailable during IPL or run time to prevent usage or ownership conflicts if the system resources are in use during that phase.

The following instructions apply to systems that are *not* connected to an HMC.

If you are managing the server using an HMC, refer to Access the ASMI using the HMC.

To set up the Web browser for direct or remote access to the ASMI, complete the following tasks:

1. Connect the power cord from the server to a power source, and wait for the control panel to display 01.
2. Select a PC or mobile computer that has Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 to connect to your server.

If you do not plan to connect your server to your network, this PC or mobile computer will be your ASMI console.

If you plan to connect your server to your network, this PC or mobile computer will be temporarily connected directly to the server for setup purposes only. After setup, you can use any PC or mobile computer on your network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 as your ASMI console.

3. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1 on the back of the managed system. If HMC1 is occupied, connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC2 on the back of the managed system.
4. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server so that your PC or mobile computer can communicate with the server. For instructions, see “Setting the IP address on your PC or mobile computer” on page 105. Use the following table to help you determine these values:

Table 2. PC or mobile computer network configuration information

Service processor	Server connector	Subnet mask	IP address
Service processor A	HMC1	255.255.255.0	169.254.2.147
	HMC2	255.255.255.0	169.254.3.147
Service processor B (if installed)	HMC1	255.255.255.0	169.254.2.146
	HMC2	255.255.255.0	169.254.3.146

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.146 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

5. Use Table 2 to determine the IP address of the Ethernet port that your PC or mobile computer is connected to, and type the IP address in the Address field of your PC’s or mobile computer’s Web browser. For example, if you connected your PC or mobile computer to HMC1, type <https://169.254.2.147> in your PC’s or mobile computer’s Web browser.
6. When the login display appears, enter one of the following default user IDs and passwords:

Table 3. Default user IDs and passwords for the Web interface

User ID	Password
general	general
admin	admin

7. Change the default password when prompted. For information, see “ASMI authority levels” on page 106.
8. If you plan to connect your PC or mobile computer to your network, complete the following steps:
 - a. From the navigation area, expand **Network Services**.
 - b. Click **Network Configuration**.
 - c. If your PC or mobile computer is connected to HMC1, fill in the section labeled Network interface eth0.
If your PC or mobile computer is connected to HMC2, fill in the section labeled Network interface eth1.
Ensure that the following fields are filled in correctly.

Table 4. Fields and values for network configuration

Field	Value
Configure this interface?	Selected
Type of IP address	Static
Host name	Enter a new value.
Domain name	Enter a new value.

Table 4. Fields and values for network configuration (continued)

Field	Value
IP address	This is a set IP address obtained from the network administrator. Note: To verify you are using the correct IP address, perform control panel function 30, CEC FSP IP address and location.
Subnet mask	This is a set subnet mask obtained from the network administrator.

Note: For information about the other fields and values, refer to “Configuring network interfaces” on page 108.

- d. Click **Continue**.
 - e. Click **Save Settings**.
 - f. Disconnect your PC or mobile computer from the server.
 - g. Connect the server to your company network.
 - h. Go to any PC or mobile computer on your company network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23, and type the following in the Address field of your browser:
https://host name.domain name

where *host name* and *domain name* are the host name and domain name you entered when completing step 8c on page 104.
 - i. Log in to the ASMI.
9. Change the time of the day on the server. For details, see “Changing the time of day” on page 108.

Setting the IP address on your PC or mobile computer:

To access the ASMI through a Web browser you first need to set the IP address on your PC or mobile computer. The following procedures describe setting the IP address on PC and mobile computers running Microsoft Windows® and Linux.

Setting the IP address in Windows XP and Windows 2000:

To set the IP address within Windows XP and Windows 2000, complete these steps.

1. Click **Start** → **Settings** → **Control Panel**.
2. On the control panel, double-click **Network Connections**.
3. Right-click **Local Area Connection**.
4. Click **Properties**.

Attention: Record the current settings before making any changes. This will allow you to restore these settings if you disconnect the PC or mobile computer after setting up the ASMI Web interface.

Note: If Internet Protocol (TCP/IP) does not appear in the list, do the following:

- a. Click **Install**.
 - b. Select **Protocol**, and then click **Add**.
 - c. Select **Internet Protocol (TCP/IP)**.
 - d. Click **OK** to return to the Local Area Connection Properties window.
5. Select **Internet Protocol (TCP/IP)**, and then click **Properties**.
 6. Select **Use the Following IP Address**.

7. Complete the **IP address**, **Subnet mask**, and **Default gateway** fields by using the values in step 4 on page 104 from Accessing the ASMI using a Web Browser.
8. Click **OK** on the Local Area Connection Properties window. It is not necessary to restart your PC.

Setting the IP address in Linux:

To set the IP address in Linux, complete these steps.

About this task

You will need the information from step 4 on page 104 in Accessing the ASMI using a Web Browser to complete step 4 in the following procedure.

1. Make sure you are logged on as a root user.
2. Start a terminal session.
3. Type `ifconfig` at the command prompt.
Attention: Record or print the current settings before making any changes. This allows you to restore these settings if you disconnect the PC or mobile computer after setting up the ASMI Web interface.
4. Type `ifconfig eth0 xxx.xxx.xxx.xxx netmask xxx.xxx.xxx.xxx`, where the `xxx.xxx.xxx.xxx` values are the values from step 4 on page 104 for IP address and Subnet mask.
5. Press Enter.

Setting the IP address in Vista:

To set the IP address in Vista, complete these steps.

1. Click **Start** → **Control Panel**.
2. Ensure **Classic View** is selected.
3. Select **Network and Sharing Center**.
4. Select **View status** in the Public network area.
5. Click **Properties**.
6. If the security dialog appears, click **Continue**.
7. Highlight **Internet Protocol Version 4**.
8. Click **Properties**.
9. Select **Use the following IP address**.
10. Complete the **IP address**, **Subnet mask**, and **Default gateway** fields by using the values in step 4 on page 104 from Accessing the ASMI using a Web Browser.
11. Click **OK** → **Close** → **Close**.

ASMI authority levels:

Several authority levels are available for accessing the service processor menus by using the ASMI.

The following levels of access are supported:

General user

The menu options presented to the general user are a subset of the options available to the administrator and authorized service provider. Users with general authority can view settings in the ASMI menus. The login ID is `general` and the default password is `general`.

Administrator

The menu options presented to the administrator are a subset of the options available to the authorized service provider. Users with administrator authority can write to persistent storage,

and view and change settings that affect the server's behavior. The first time a user logs into the ASMI after the server is installed, a new password must be selected. The login ID is `admin` and the default password is `admin`.

Authorized service provider

This login gives the authorized service provider access to all functions that could be used to gather additional debug information from a failing system, such as viewing persistent storage, and clearing all deconfiguration errors. There are three authorized service provider login IDs: **celogin**, **celogin1**, and **celogin2**.

- **celogin** is the primary service provider account. It is enabled by default, and it can enable or disable the other two service provider IDs (**celogin1** and **celogin2**). The login ID is **celogin**; the password is generated dynamically and must be obtained by calling technical support. **celogin** can be disabled by the **admin** user.
- **celogin1** and **celogin2** are disabled by default. If the IDs are enabled, a static password must be set for them. The default password for both IDs is **celogin**. The default password must be changed the first time the ID is enabled. The **admin** user can also disable and enable these login IDs.
- To reset the password for **celogin1** or **celogin2**, the **admin** user can disable, then re-enable the ID. As soon as the ID is re-enabled, the password must be changed.
- If enabled, **celogin**, **celogin1**, or **celogin2** can be used to reset the admin password, if necessary.

During the initial administrator and general user logins, the only menu option available is **Change Password**. In order to gain access to additional ASMI menus, you must change the administrator and general user default passwords. If you are an authorized service provider, you cannot change your password. For information about how to change your password, see "Changing ASMI passwords."

Changing ASMI passwords:

Change the general user, administrator, and HMC access passwords.

About this task

You can change the general user, administrator, and HMC access passwords. If you are a general user, you can change only your own password. If you are an administrator, you can change your password and the passwords for general user accounts. If you are an authorized service provider, you can change your password, the passwords for general and administrator user accounts, and the HMC access password.

Passwords can be any combination of up to 64 alphanumeric characters. The default password for the general user ID is `general`, and the default password for the administrator ID is `admin`. After your initial login to the ASMI and after the reset toggle jumpers are moved, the general user and administrator passwords must be changed.

The HMC access password is usually set from the HMC during initial login. If you change this password using the ASMI, the change takes effect immediately.

To change a password, follow these steps:

Note: As a security measure, you are required to enter the current user's password into the **Current password for current user** field. This password is not the password for the user ID you want to change.

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Login Profile**.
3. Select **Change Password**.

4. Specify the required information, and click **Continue**.

Configuring network interfaces:

You can configure network interfaces on the system. The number and type of interfaces vary according to the specific needs of your system.

About this task

Attention: This operation can be performed when the system is powered on as well as powered off. Because network configuration changes occur immediately, existing network sessions, such as HMC connections, are stopped. If a firmware update is in progress, do not perform this operation. The new settings must be used to re-establish any network connections. Additional errors might also be logged if the system is powered on.

You can change the network configurations when the system is in any state.

To perform this operation, you must have one of the following authority levels:

- Administrator
- Authorized service provider

To configure network interfaces, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Network Services**.
3. Select **Network Configuration**.

Important: If you are attempting to configure a network connection on a multi-drawer system, you must select the primary or secondary service processor, and then click **Continue**.

4. In the right pane, locate the interface that you want to change. Select the box corresponding to the **Configure this interface?** field of the identified interface. If this box is not selected, the corresponding field changes are ignored.
5. Select the **Type of IP address** from the following options:

Static The IP address, subnet mask, broadcast address, default gateway and first DNS server address must be entered. The second and third DNS server addresses are optional.

Dynamic

No additional input is required.

6. Click **Continue**. The next screen allows you to verify the IP settings that have been entered.

Attention: If incorrect network configuration information is entered, you may not be able to use the ASMI after the changes are made. To remedy this situation, you must reset the service processor to the default settings by removing the service processor assembly from the server and moving the reset jumpers. Resetting the service processor also resets all user IDs and passwords to their default values.

Note: To reset network configuration settings to the default factory settings, click **Reset Network Configuration**.

7. Click **Save settings** to make the changes.

Changing the time of day:

You can display and change the system's current date and time. The date and time can only be changed when the system is powered off. The time is stored as UTC (Coordinated Universal Time), formerly expressed as Greenwich mean time (GMT).

About this task

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

- Administrator
- Authorized service provider

Note: You can change the time of day only when the system is powered off.

To change the time of day, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration**.
3. Select **Time of Day**. If the system is powered off, the right pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, seconds).
4. Change either the date value or the time value or both, and click **Save settings**.

Accessing the ASMI using the HMC

Complete these steps to access the ASMI through the HMC interface.

About this task

To access the Advanced System Management Interface (ASMI) using the HMC, complete the following steps:

1. From the **System Management** tasks list, select **Operations**.
2. From the Operations task list, select **Advanced System Management (ASM)**.

Service Action Log (SAL)

The Service Action Log (SAL) is a subset of the PAL.

To access the SAL, select the following options, in order, from a DST or SST menu:

- Start a service tool
- Hardware service manager
- Work with service action log

The SAL is a utility that scans the PAL and displays entries that require service representative action. It pulls out the relevant information from those entries and formats it to the display to show service information, such as failing resource names, field replaceable unit (FRU) part numbers, and FRU locations. If FRU part numbers and locations cannot be determined, the SAL display shows symbolic FRU names and isolation procedure names, which then correspond to problem analysis procedures for the service representative. The SAL runs before the operating system is operational.

A **shadow** log is maintained by LIC on the load source disk. The 128 K-byte shadow log contains a duplicate of the most recent or latest Product Activity Log entries that occurred before IPL began and those entries that were logged since the beginning of IPL. The *Product Activity Log* option uses the shadow log when the system is operating in limited paging environment.

If Product Activity Log initialization is not complete, only the shadow log is accessible to this option. Also, the *Product Activity Log* menu offers only a few specific Product Activity Log options. The Main menu informs the user that log initialization has not completed, that all Product Activity Log entries are not accessible, and to IPL the operating system to complete initialization. If initialization completes after the *Product Activity Log* option has been selected, the option must be selected again to make all Product Activity Log options available for use and to generate reports that show all the log entries.

Identifying a failing part on an AIX system or logical partition

Use these instructions to learn how to locate a failing part, and then activate the indicator light for that part on a system or logical partition running the AIX operating system.

Locating 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 shows 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. Select **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.

Results

Use the location information for the failing part to activate the indicator light that identifies the failing part.

Activating the indicator light for the failing part

Use these instructions to help physically identify the location of a part you are servicing.

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** and press Enter.
4. From the Task Selection menu, select **Identify and Attention Indicators** and 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.

Identifying a failing part on a Linux system or logical partition

Use the instructions in this section to identify a failing part on a system or logical partition running the Linux operating system.

Locateing a failing part in a system or logical partition running the operating system

If the service aids have been installed on a system or logical partition you need to locate the failing part and then activate the indicator light for that part.

Finding the location code of a failing part in a Linux system or logical partition

Use these instructions to retrieve the location code of the failing part, if you do not know the location code.

About this task

To locate the failing part in a system or logical partition 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.

Activating 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.

About 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.
3. Look for the system attention light to identify the enclosure that contains the failing part.

Deactivating the failing-part indicator light

After you complete a removal and replacement procedure, use this task to deactivate the failing-part indicator light.

About this task

To deactivate the indicator light, follow these steps:

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s normal -l<location code>` and press Enter.

Locate a failing part in a Virtual I/O Server system or logical partition

You might need to use Virtual I/O Server (VIOS) 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 `diagmenu` 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.

Results

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see “Identifying a part using the Virtual I/O Server.”

Identifying a part using the Virtual I/O Server

Use these instructions to turn on the indicator light to help you physically locate a part using the Virtual I/O Server (VIOS).

1. Log in as root user.
2. At the command line, type `diagmenu` 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.

Starting or stopping the system or logical partition

Learn how to start or stop a system or logical partition to perform a service action or restart the system.

Start the system or logical partition

You might need to start a system or logical partition after performing a service action or system upgrade. You can use this procedure to start the system or logical partition.

About this task

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.

About this task

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, as shown in the following figure, is slowly blinking.
 - The top of the display, as shown in the following figure, shows 01 V=F.

Tip: The system attention light, as shown in the following figure, does not appear on the control panel on the model 17M/MA.

3. Press the power button (**A**), as shown in the following figure, on the control panel.

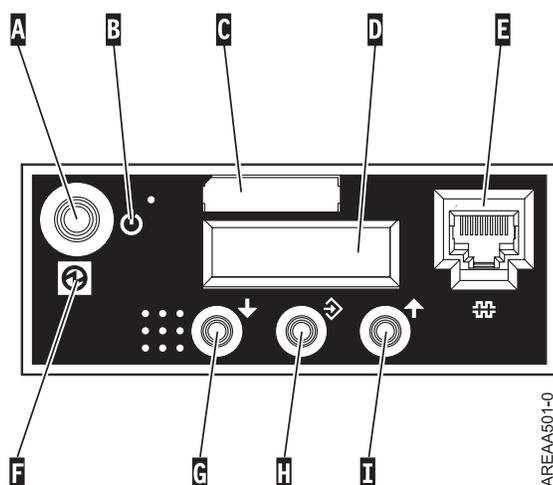


Figure 90. 5/70 control panel

- A: Power-on button
- B: On/off power symbol
- C: Serial number label

- **D:** Function/Data display
- **E:** System port (S1)
- **F:** Power LED
 - A blinking light indicates standby power to the unit.
 - A constant light indicates full system power to the unit.

Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from blinking to solid. During the transition period, you might observe the blinking intervals speed up.

- **G:** Decrement button
- **H:** Enter button
- **I:** Increment button

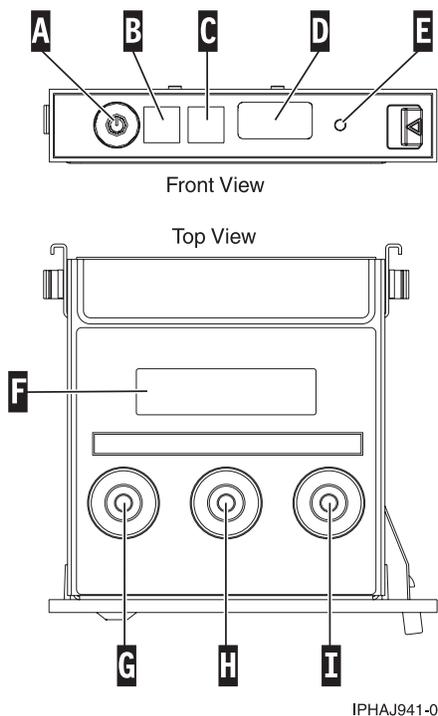


Figure 91. Control panel for the 03E/4A, 04E/8A.

- **A:** Power-on button
- **B:** Power LED
 - A blinking light indicates standby power to the unit.
 - A constant light indicates full system power to the unit.

Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from blinking to solid. During the transition period, you might observe the blinking intervals speed up.

- **C:** Attention light
- **D:** USB port
- **E:** Pinhole reset button
- **F:** Function/Data display
- **G:** Decrement button

- **H:** Enter button
 - **I:** Increment button
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.

What to do next

Tip: If pressing the power button does not start the system, do the following steps to start the system using the Advanced System Management Interface (ASMI):

1. Set up access to the ASMI. For instructions, see “Managing the Advanced System Management Interface” on page 103.
2. Start the system using the ASMI. For instructions, see “Powering the system on and off.”

Powering the system on and off:

View and customize various initial program load (IPL) parameters.

About this task

You can start and shut down the system in addition to setting IPL options.

To perform these operations, your authority level must be one of the following:

- Administrator
- Authorized service provider

Several IPL options that you can set pertain to the server firmware. Firmware is an integral part of the server that is stored in *flash memory*, whose contents are preserved when the system is powered off. The firmware is code that automatically starts when the server is turned on. Its main purpose is to bring the server to a state where it is ready to operate, which means the server is ready to install or boot an operating system. Firmware also enables the handling of exception conditions in the hardware and provides extensions to the functions of the server hardware platform. You can view the server’s current firmware level on the Advanced System Management Interface (ASMI) Welcome pane.

This server has a permanent firmware boot side, or P side, and a temporary firmware boot side, or T side. When updating the firmware, install new levels of firmware on the temporary side first to test the compatibility with your applications. When the new level of firmware has been approved, copy it to the permanent side.

To view and change IPL settings, perform the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Power/Restart Control** and select **Power On/Off System**.
3. Set the following desired boot settings.

Note: On systems with the EM310_xxx release of system firmware installed, *slow* and *fast* are the only two boot speeds available.

System boot speed

Select the speed for the next boot:

- Slow** All IPL diagnostic tests are run, and the full memory test is run.
- Fast** Several IPL diagnostic test are skipped, and a shorter memory test is run.

Note: This is the default setting on systems with firmware EX310_xxx or later installed.

- Hyper** This option is available only when hyperboot is enabled. The majority of the initial program load (IPL) diagnostics are skipped, and cached data is used for vital product data (VPD), system configuration, and main store data. Since there is minimal VPD verification that the hardware is the same as the previous boot, this speed setting should only be used if there have not been any hardware changes since the last system boot.

Firmware boot side for next boot

Select the side from which the firmware boots the next time: **Permanent** or **Temporary**. Test firmware updates by booting from the temporary side before being copied into the permanent side.

System operating mode

Select the operating mode: **Manual** or **Normal**. Manual mode overrides various automatic power-on functions, such as auto-power restart, and enables the power button.

Boot to system server firmware

Select the state for the server firmware: **Standby** or **Running**. When the server is in the server firmware standby state, logical partitions can be set up and activated.

System power off policy

Select the system power off policy. The system power off policy is a system parameter that controls the system's behavior when the last partition (or the only partition in the case of a system that is not managed by an HMC) is powered off.

Default partition environment

Select **Default** (valid only if the BR keyword is not S0), **AIX**, , or **Linux**.

Notes:

- If the default partition environment is changed from any other value to , the enable/disable setting is automatically changed to Enabled.
- If the default partition environment is changed from to any other value, the enable/disable setting is not affected.

Current[®] hyperboot mode state

This setting is displayed if the hyperboot feature is activated for the system. The hyperboot mode states are: **Capable** and **Enabled**. When the mode state is changed to **Enabled**, the mode state initializes in the ASMI and displays **Capable** until the system is restarted. After the system has restarted the state changes to **Enabled**. Any time you restart the system in the enabled state, it starts in hyperboot mode.

4. Perform one of the following steps:
 - Click **Save settings** to save the selected options. The power state does not change.
 - Click **Save settings and power on/off**. All selected options are saved and the system turns on or off. The power-on option is available only if the system is powered off. The power-off option is available only if the system is powered on.
 - Click **Save settings and continue server firmware boot** to save the selected options, and turn the server firmware on or off. This option is available only if the server firmware is in *standby* mode.

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.

About this task

For instructions on working with the HMC, see *Managing the Hardware Management Console*. For instructions on starting a logical partition, see *Logical partitioning*. 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. When the power-on light on the control panel stops blinking and remains on, the system power is on.

Powering on a managed system:

Understand how to power on a managed system using the HMC.

About this task

You can use the HMC to power on a managed system and to monitor the power-on state.

To power on a managed system, you must be a member of one of the following roles:

- super administrator
- service representative
- operator
- product engineer

To power on a managed system, complete the following steps:

1. In the Navigation area, expand the **Systems Management** folder.
2. Click the **Servers** icon.
3. In the Contents area, select the managed system.
4. Select **Tasks**, then **Operations**, and then **Power On**.
5. Select the desired power-on mode and click **OK**.

Stop a system or logical partition

Learn how to stop a system or logical partition as a part of a system upgrade or service action.

About this task

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:

Stopping a 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.

Before you begin

Before you stop the system, follow these steps:

1. Ensure that all jobs are completed and end all applications.
2. Ensure that the operating system is stopped.

Attention: Failure to do so can result in the loss of data.

About this task

The following procedure describes how to stop a system that is not managed by a Hardware Management Console (HMC).

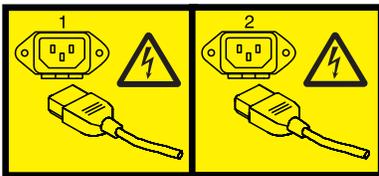
1. Log in to the system as a user with the authority to run the shutdown or Power Down System (pwrdownsys) command.
2. At the command line, enter one of the following commands:
 - If your system is running the AIX operating system, type **shutdown**.
 - If your system is running the Linux operating system, type **shutdown -h now**.
 - If your system is running the operating system, type **PWRDWN SYS**. If your system is partitioned, use the PWRDWN SYS command to power down each of the secondary partitions. Then, use the PWRDWN SYS command to power down the primary partition.

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

About this task

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.

By default, the managed system is set to power off automatically when you shut down the last running logical partition on the managed system. If you set the managed system properties on the HMC so that the managed system does not power off automatically, you must use this procedure to power off your managed system.

Attention: If possible, shut down the running logical partitions on the managed system before powering off the managed system. Powering off the managed system without shutting down the logical partitions first causes the logical partitions to shut down abnormally and can cause data loss.

To power off a managed system, you must be a member of one of the following roles:

- super administrator
 - service representative
 - operator
 - product engineer
1. In the Navigation area, expand the **Systems Management** folder.
 2. Click the **Servers** icon.
 3. In the Contents area, select the managed system.
 4. Select **Tasks**, then **Operations**, and then **Power Off**
 5. Select the desired power-off mode and click **OK**.

Disconnect the SMP processor cable from a system unit

You might need to disconnect this cable to add or remove memory or processors. Use the procedure in this section to accomplish this task.

About 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 provided power cord. Do not use the 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.

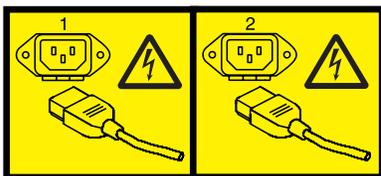
(D005a)

To disconnect an SMP processor cable connection from a system unit, complete the following steps:

1. If necessary, open the front door of the rack.
2. Disconnect the power source from the system by unplugging the system.

Note: This system can 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



3. "Removing the front cover from the model 34E/MA, 17M/MA, or " on page 137.
4. Remove the left edge of the trim kit on the system rack to expose the left edge of the SMP processor cable.

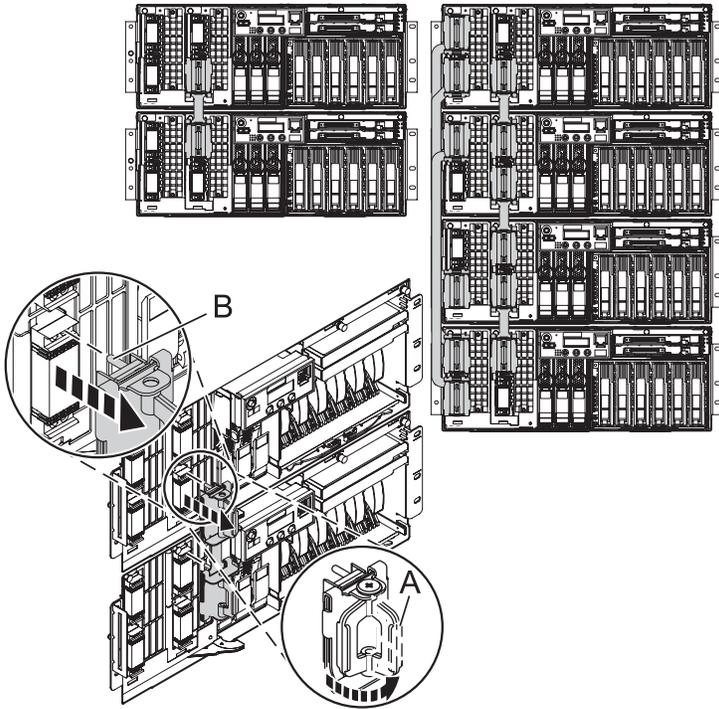
Attention:

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.

5. Unlatch the plastic fastener **A**, as shown in the following figure.
6. Lift the latch handle **B** until the connector is unseated.



7. Carefully pull the connector from the system.
8. When the guide pins are free, carefully pull the cable away from the system unit.

Reconnect the SMP processor cable to a system unit

You might need to reconnect this cable after adding or removing memory or processors. Use the procedure in this section to accomplish this task.

About 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 provided power cord. Do not use the 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.

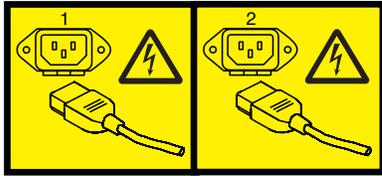
(D005a)

To connect an SMP processor cable to a single system unit, complete the following steps:

1. Perform prerequisite tasks as described in “Before you begin” on page 101.
2. Stop all system units. Refer to “Stop a system or logical partition” on page 116.
3. If necessary, open the front rack door.
4. Disconnect the power source from the system by unplugging the system.

Note: This system can 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)



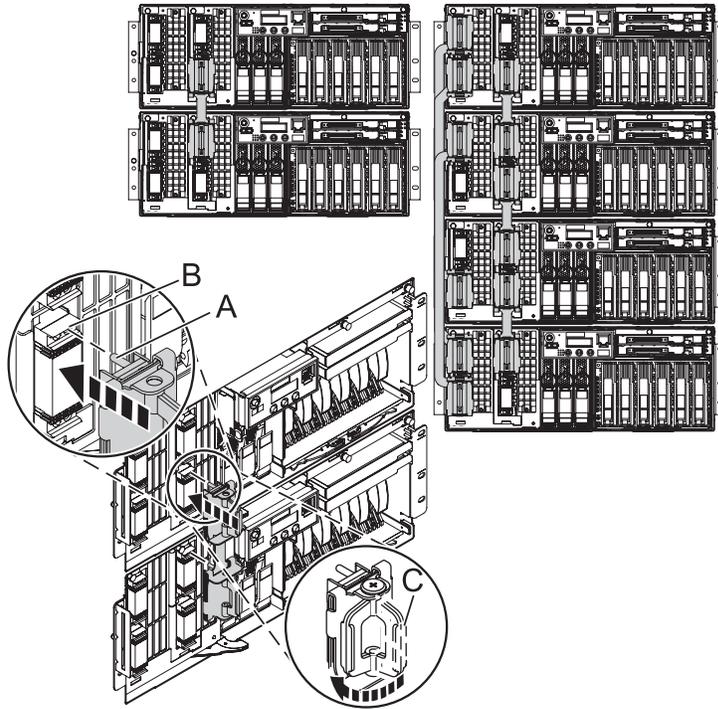
or



5. If necessary, remove the left edge of the trim kit on the system rack.

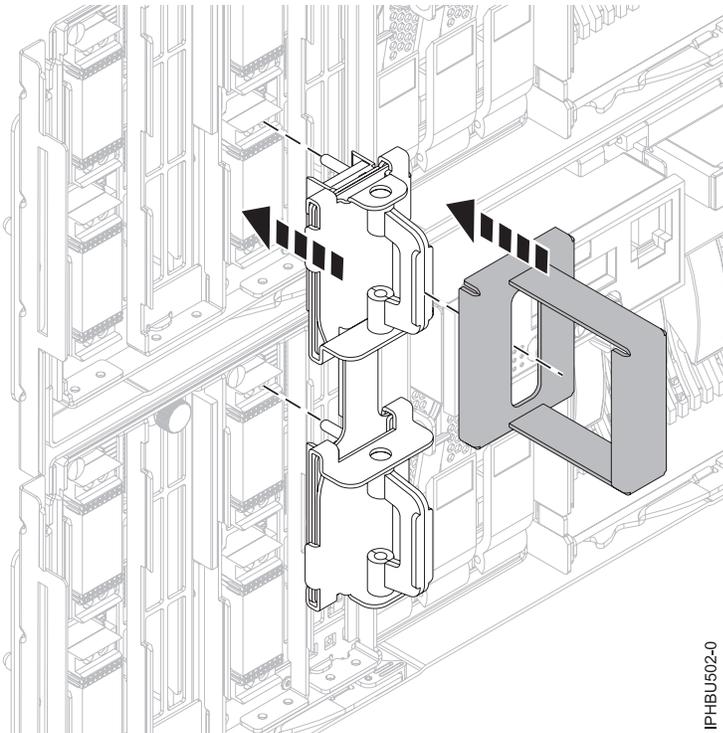
Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) 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. Lift the latch handle C to the open position.



7. Align the guide pins **A** with the connector **B** on the system unit.
8. Carefully push the cable connector into the system unit connection.

Note: Evenly press the connector in place, using firm straight pressure on both the top and bottom of each cable-end. At the same time, press evenly at the top and bottom of each cable-end. Use the SMP tool to seat the cable as shown in the following figure.



IPHBU502-0

Figure 92. Using the SMP cable tool

9. Push the latch handle down to seat the pins.
10. Replace the left edge of the trim kit.
11. “Installing the front cover on the model 34E/MA, 17M/MA” on page 138.
12. Close the front rack door.

Results

Removing and replacing 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.

Remove the front cover on model 14G/30

You might need to remove the front cover to perform service to the system. Use the instructions in this section to accomplish these tasks.

1. Remove the two thumbscrews (**B**) located on the left and right of the cover.

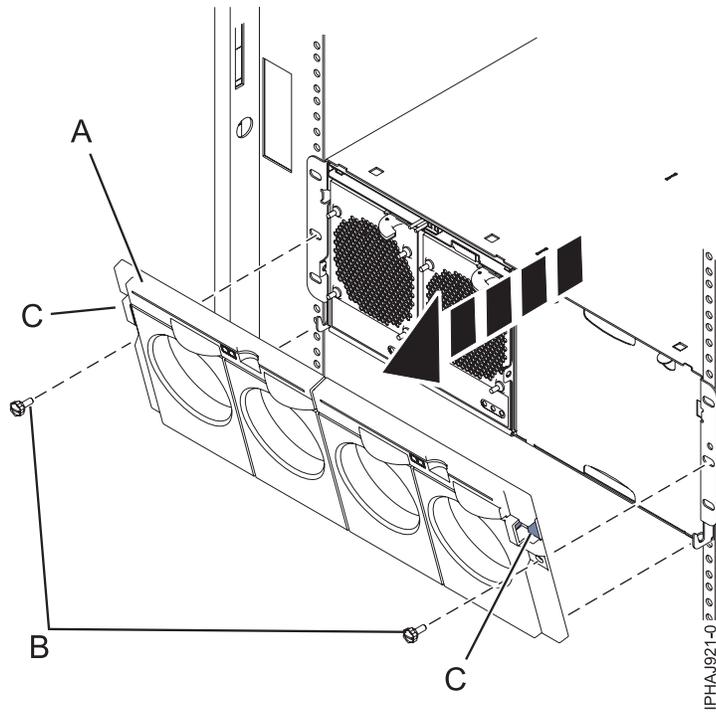


Figure 93. Remove the front cover for model 14G/30

2. Press in on the two latches (C) located left and right of the cover to release the cover.
3. Lift the cover (A) out and away from the chassis.

Tip: If an airflow block is present on an unpopulated side of the chassis do not remove it unless you are populating that side of the chassis.

Installing the front cover on a model 14G/30

You might need to install the front cover after installing the system or performing a service action.

Before you begin

If you only have one side of the chassis populated, ensure that the airflow block is present on the unpopulated side.

1. Insert the posts on the bottom of the cover (A) into the hooks on the chassis of the enclosure.
2. Press in on the two latches (C) on the right and left of the front cover.

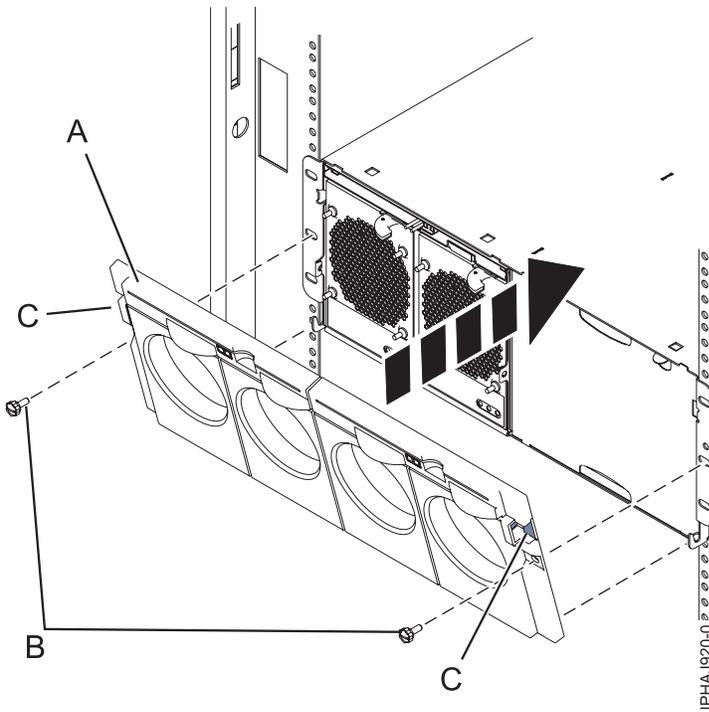


Figure 94. Front cover on a model 14G/30

3. Push the cover onto the chassis and release the latches. The cover should securely snap into place.
4. Replace the two thumbscrews (B) into the slots on the left and right of the front cover.

Removing the front cover from a 11D/11 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.

About this task

To remove the front cover, follow these steps:

1. Open the rack front door, if necessary.
2. Press down on both release tabs and pivot the cover from the top forward.
3. Pull the cover out and away from the expansion unit.

Install the front cover on the 11D/11 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.

About 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.
2. Insert the tabs on the bottom of the cover into the slots at the front of the expansion unit.
3. Push the cover up and forward until the tabs on the top secure the cover in place.

Removing a front cover from the 11D/20 expansion unit

You might need to remove the cover to access components or perform service.

About 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.

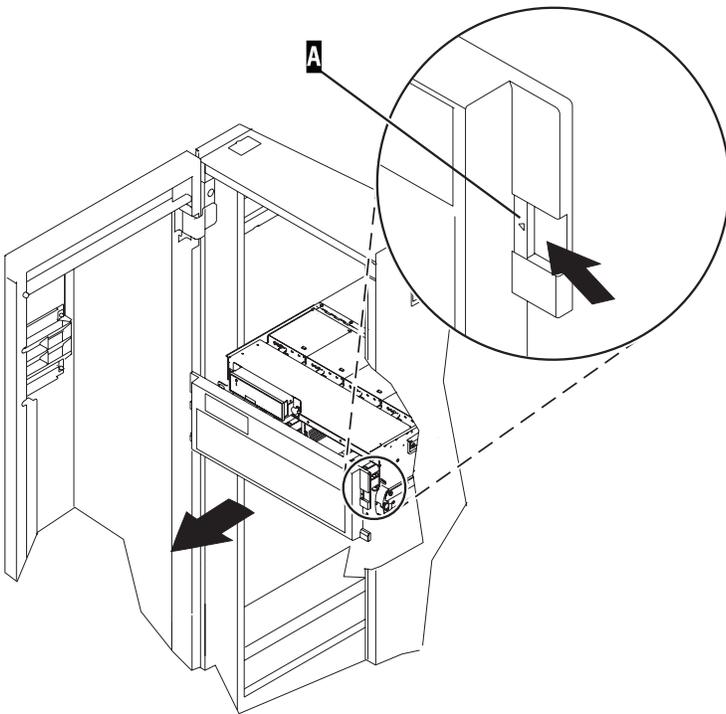


Figure 95. Removing the front cover

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.

Installing a front cover on the 11D/20 expansion unit

You might need to install the cover after accessing components or performing service.

About 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.

Results

Removing and Replacing Covers and Doors

You might need to remove, replace, or install covers to access components or perform service.

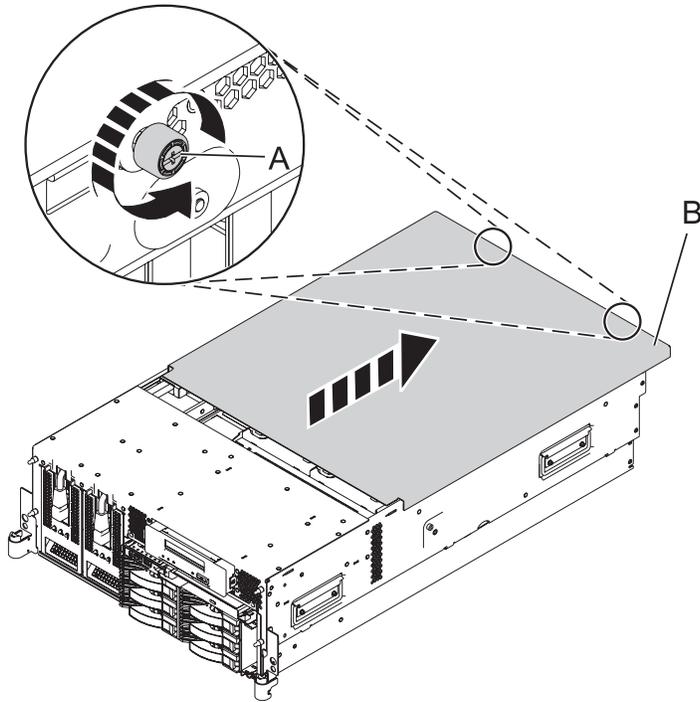
Removing the service access cover from a rack-mounted model 03E/4A, 04E/8A

You might need to remove the service access cover to perform service or to gain access to internal components.

1. Place the system into the service position, for instructions see “Placing a rack-mounted model 03E/4A, 04E/8A in the service position” on page 144.
2. Loosen the two thumbscrews **(A)** located at the back of the cover.
3. Slide the cover **(B)** 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.

Results

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.



IPHAJ851-0

Figure 96. Remove the service access cover from a rack-mounted model

Install the service access cover on a rack-mounted model 03E/4A, 04E/8A

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.

1. Place the service access cover (A) on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
2. Hold the service access cover against the system unit, and slide it toward the front of the system. 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.

Important: Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward.

3. Tighten the thumbscrews (B) located at the back of the cover.

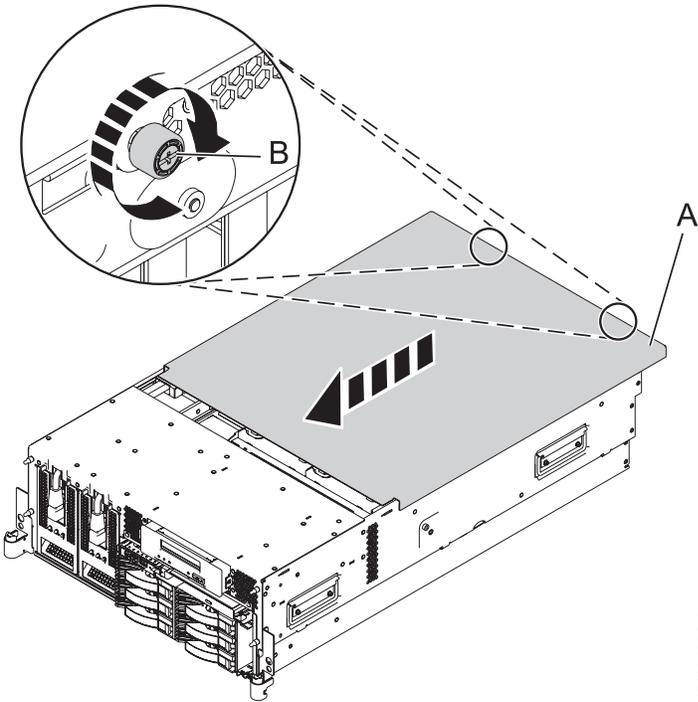


Figure 97. Install the service access cover on the rack-mounted model

Removing the service access cover from a stand-alone model 03E/4A, 04E/8A

You might need to remove the service access cover to perform service or to gain access to internal components.

About this task

To remove the service access cover from a stand-alone model do the following:

1. Loosen the two thumbscrews (**A**) located at the back of the service access cover as shown in the following figure.
2. Slide the service access cover (**B**) 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.

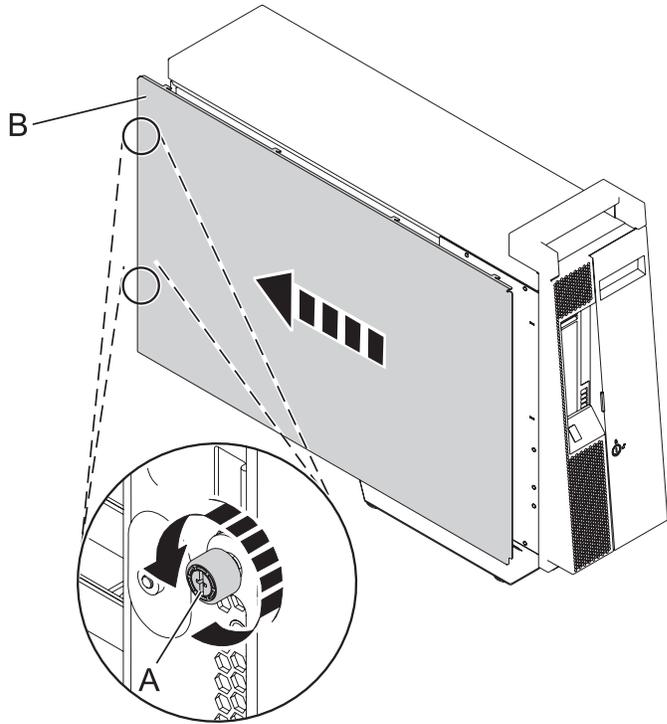


Figure 98. Removing the service access cover from the stand-alone model

Installing the service access cover on a stand-alone model 03E/4A, 04E/8A

You might need to install the service access cover after performing service or accessing internal components.

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.
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.

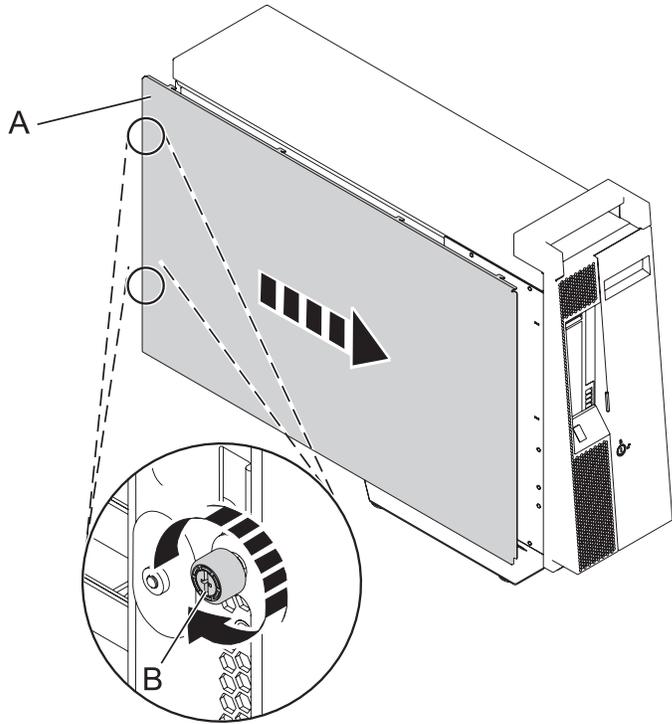


Figure 99. Installing the service access cover on a stand-alone model

Removing the front cover from a rack mounted model 03E/4A, 04E/8A

You might need to remove the cover to access components or perform service.

1. Remove the two thumbscrews (A) that secure the system to the rack (B) as shown in the following figure.
2. Push in the release latches (C) and pull the cover away from the system.

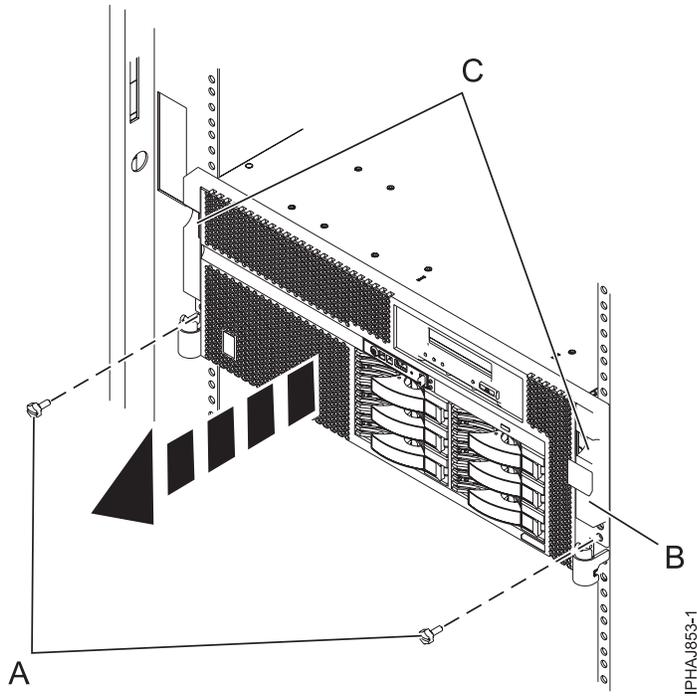


Figure 100. Removing the front cover from a rack-mounted model

Installing the front cover on the rack-mounted model 03E/4A, 04E/8A

You might need to install the cover after accessing components or performing service.

1. Push in the release latches **(B)** and push the cover onto system.
2. Gently push the cover in until the two cover-release latches **(B)** are seated in their respective slots.
3. Replace the two thumbscrews **(C)** that secure the system to the rack **(A)** as shown in the following figure.

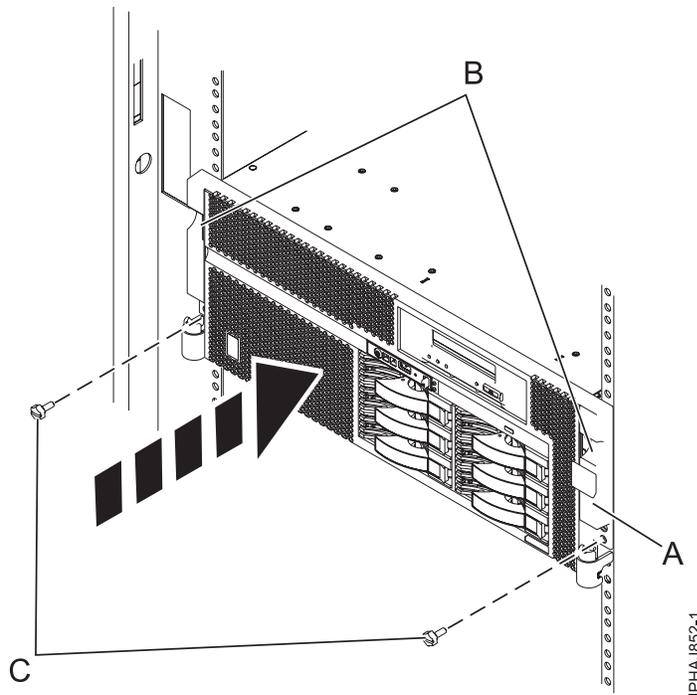


Figure 101. Installing the front cover on a rack-mounted model

Removing the door from a model 04E/8A

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

1. Open the front door by grasping the door handle and pulling the door out and away from the system unit.
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.

Installing or replacing the door on a model 04E/8A

You might need to install the door after accessing components or performing service.

1. Set the door on the lower retaining post.
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 into its matching slot.
4. Close and secure the door.

Remove the front cover from the stand-alone model 03E/4A, 04E/8A

You might need to remove the cover to access components or perform service.

1. Open the door covering the disk drives by unlocking and pulling the door open.
2. Press down on the cover-release tab (A) as shown in the following figure.
3. Pull the top of the cover (B) out and away from the system.

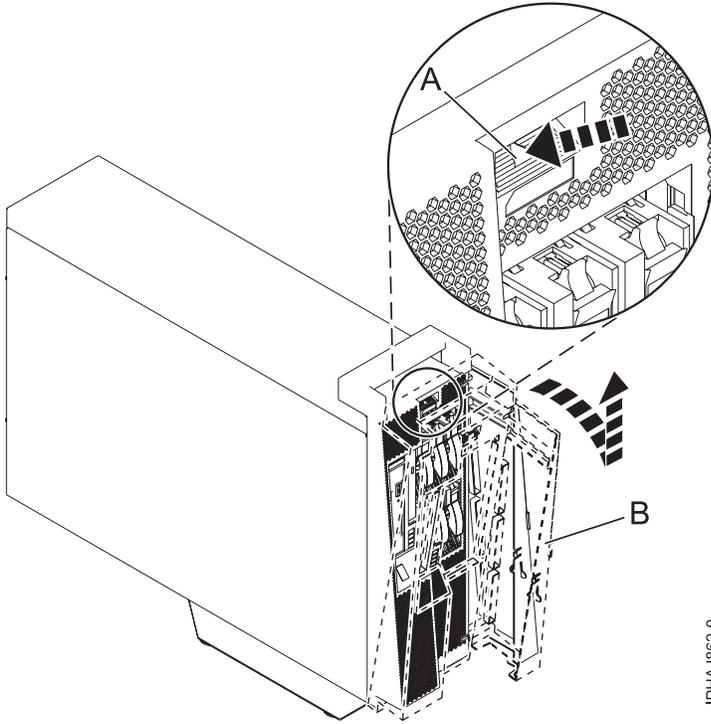


Figure 102. Remove the door from the model

4. Gently pull the cover up and off the base.

Installing the front cover on a stand-alone model 03E/4A, 04E/8A

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

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.

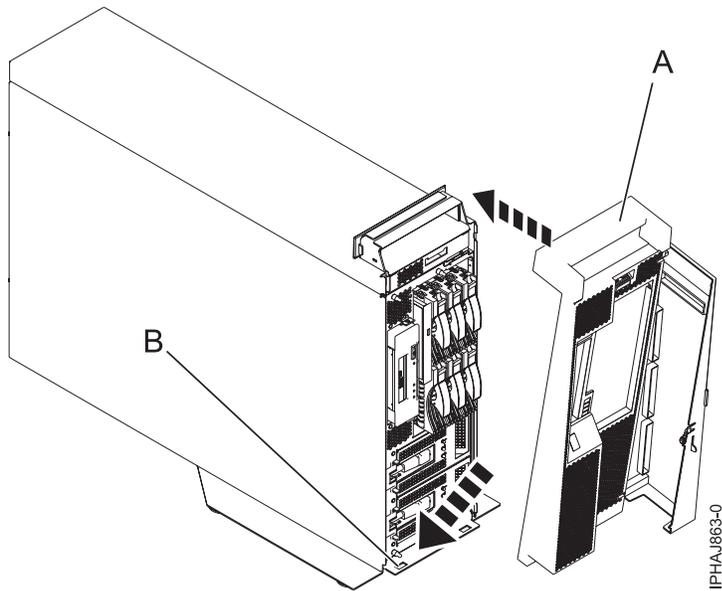


Figure 103. Replacing the cover on the model

2. Push the cover up toward the top of the system (A), ensuring that the aligning pins are aligned with their matching slots (B) located on the system.
3. Gently push the cover in until the cover-release tab snaps into place.
4. Close and secure the door.

Results

Front cover for the model 34E/MA, 17M/MA

You might need to remove and replace the cover to access components or perform service.

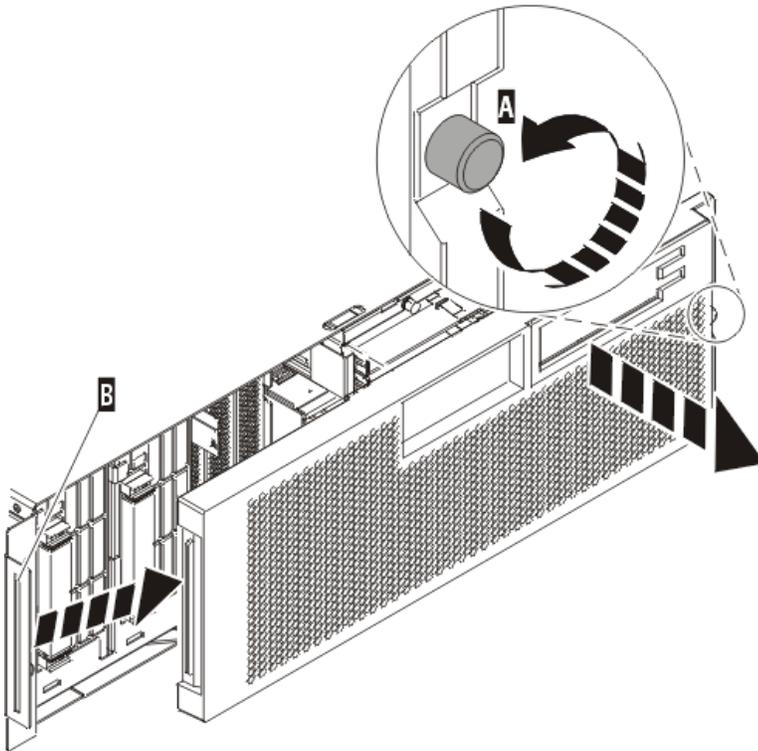
Removing the front cover from the model 34E/MA, 17M/MA, or

You might need to remove the cover to access components or perform service.

About 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.



IPHA1F01-1

Figure 104. Removing the front cover

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

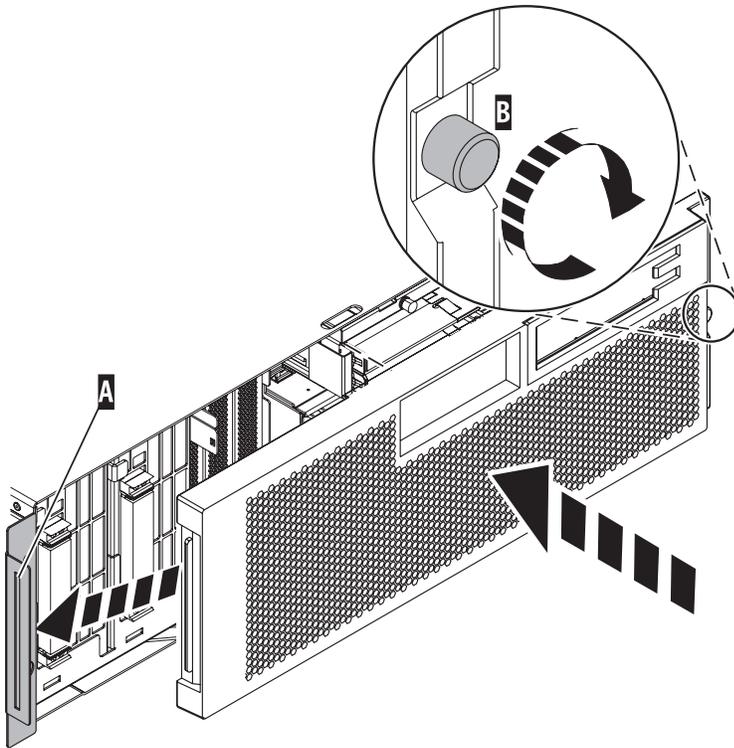
Installing the front cover on the model 34E/MA, 17M/MA

You might need to install the cover after accessing components or performing service.

About 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

Figure 105. Installing the front cover

2. Tighten the thumbscrew on the right side of the cover.
3. 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 to gain access to internal components.

Placing 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.

About 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 provided power cord. Do not use the 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.

(D005a)

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 a 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.

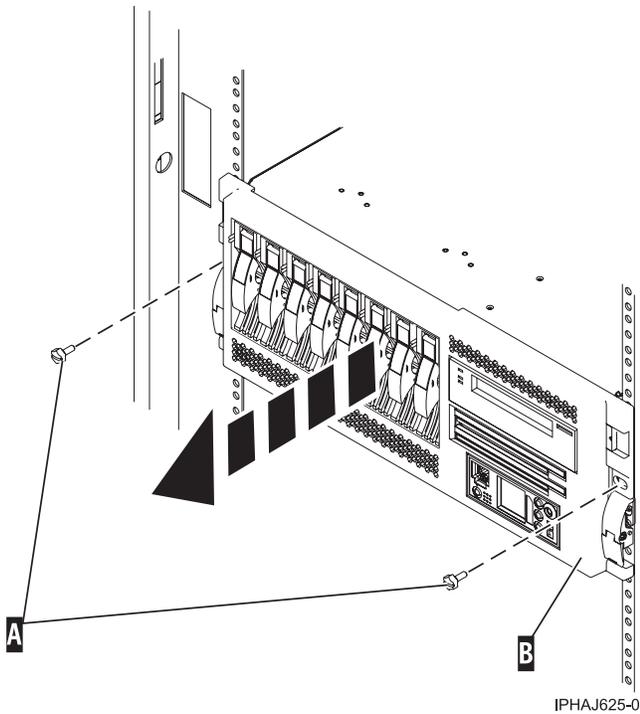


Figure 106. Removing the thumbscrews from the system and rack

3. Release the rack latches (A) on both the left and right sides as shown in the following figure.

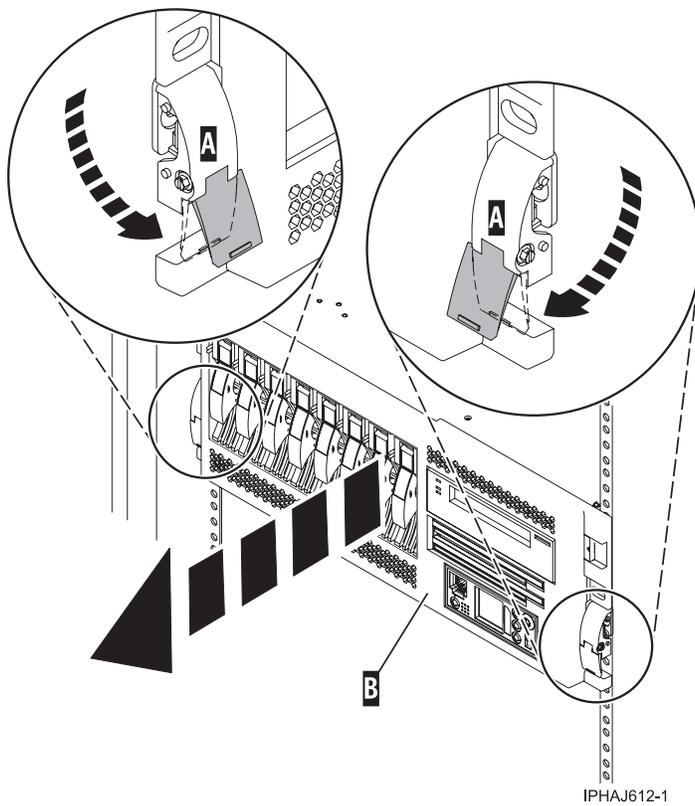


Figure 107. Releasing the rack latches

4. Read 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.

Placing 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.

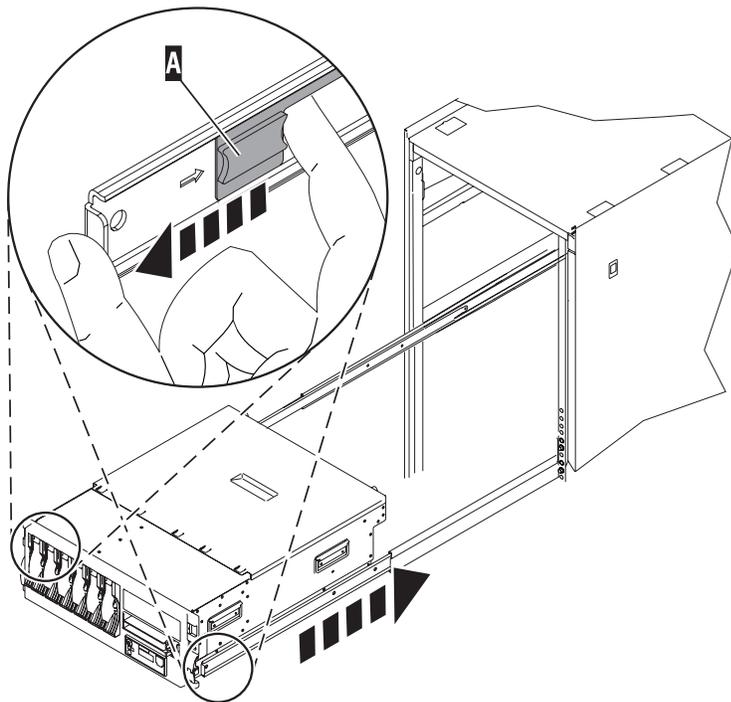
About this task

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

Figure 108. Releasing the rail safety latches

2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.

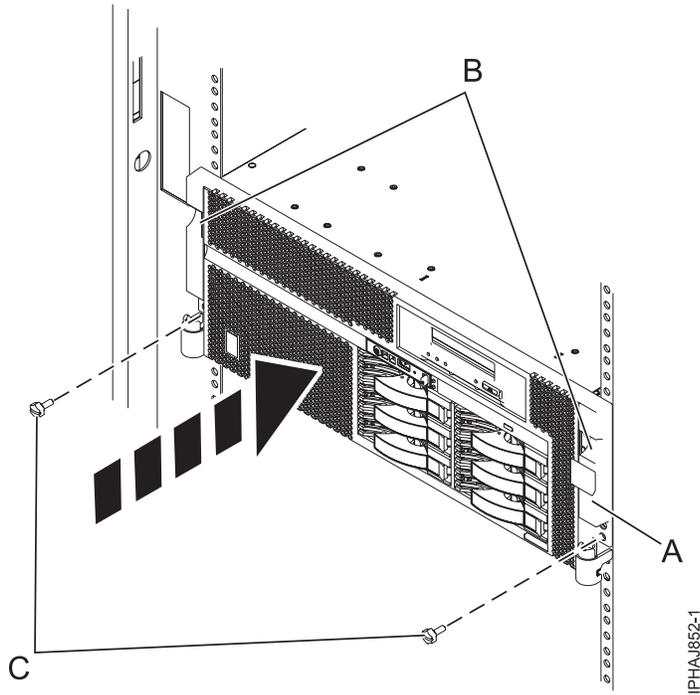


Figure 109. Pushing the system into the rack and attaching the thumbscrews

3. Close the front rack door.

Placing a rack-mounted model 03E/4A, 04E/8A 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.

About 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 provided power cord. Do not use the 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.

(D005a)

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 unit to the rack as shown in the following figure.
3. Release the rack latches (B) on both the left and right sides as shown in the following figure.

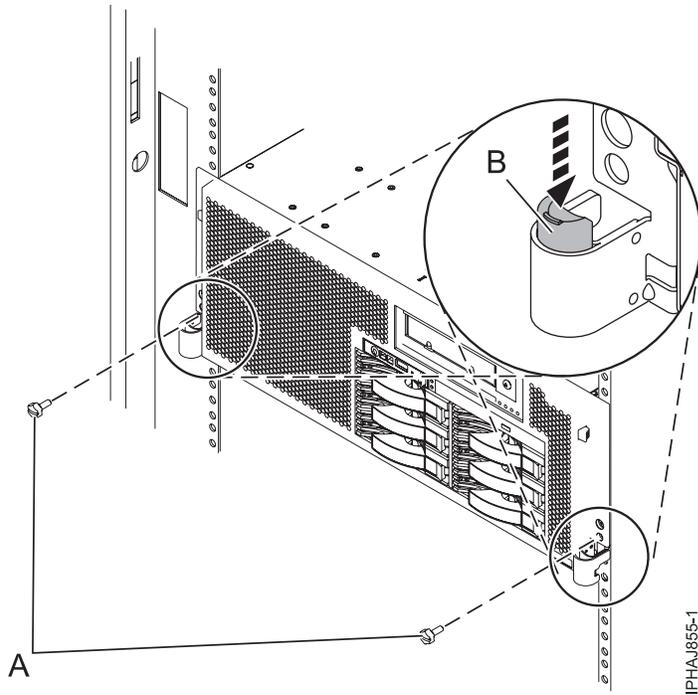


Figure 110. Releasing the rack latches

4. Read 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.

Placing the rack-mounted 03E/4A, 04E/8A 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.

About 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.

1. Simultaneously release the blue rail safety latches (**B**), 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.

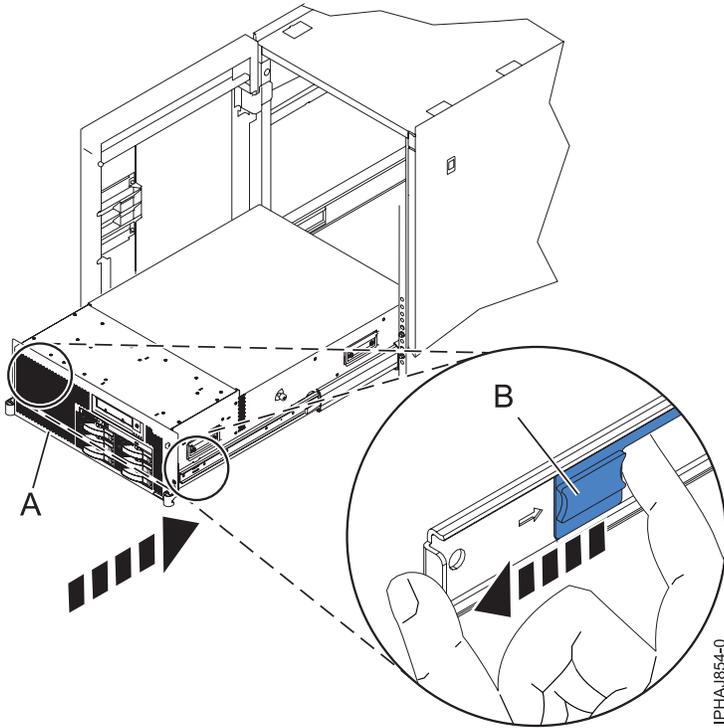


Figure 111. Releasing the rail safety latches

2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.

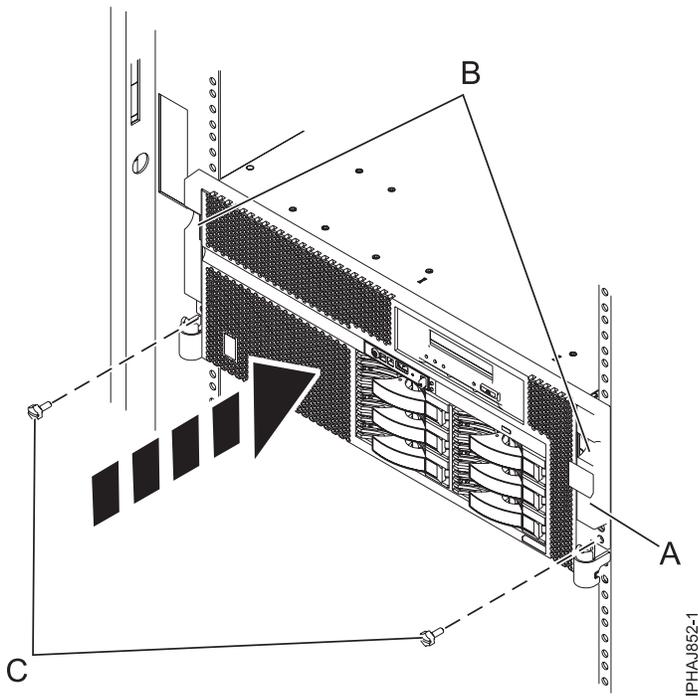


Figure 112. Replacing the thumbscrews

3. Close the front rack door.

Viewing existing firmware levels

Find out how to view the level of firmware that currently runs on your server.

About this task

You can view the current and backup levels of server firmware on the managed system.

Using the HMC to view the existing firmware levels

Learn how to view the level of firmware that currently runs on your server using the HMC.

1. In the Navigation area, click **Updates**.
2. Ensure that the managed system Status is Power Off, Standby, or Operating.
3. Record the level that appears in the EC Number field. For example, 01EM310.

Using the ASMI to view the existing level of server firmware

Find out how to use the ASMI to view the level of firmware that currently runs on your server.

About this task

On the ASMI Welcome pane, view the existing level of server firmware in the upper-right corner below the copyright statement, for example, 01EM310.

Installing a feature using the Hardware Management Console

You can use the Hardware Management Console to perform many service actions; including the installation of a new feature or part.

Before you begin

To use the Hardware Management Console user interface to install a feature or part into a system or expansion unit that is managed by an HMC, follow these steps:

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.

Removing a part using the Hardware Management Console

Use the Hardware Management Console (HMC) to facilitate removing a part from your managed system.

About this task

To use the Hardware Management Console user interface to remove a part in a system or expansion unit that is managed by an HMC, follow these steps:

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.
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. After the part is listed in the **Pending Actions** display click **Launch Procedure** and follow the instructions to remove the part.

Note: The HMC might open the information center instructions for removing the part. If so, follow those instructions to remove the part.

Exchange a part using the Hardware Management Console

About this task

If you are exchanging a part to repair a serviceable event follow those instructions. If you are exchanging a part as a part of any other procedure using HMC Version 7 or later use these steps, "Exchange a part using the HMC Version 7."

Exchange a part using the HMC Version 7

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system in which you are exchanging a part.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Exchange FRU**.
7. In the **Replace Hardware - Replace FRU, Select FRU Type** window select the system or enclosure in which you will exchange a part from the list.
8. Select the type of part you will exchange from the menu and click **Next**.
9. Select the location code of the part you will exchange from the menu and click **Add**.
10. Once the part is listed in **Pending Actions** click **Launch Procedure** and follow the instructions to exchange the part.

Note: The HMC might open external instructions for replacing the part. If so, follow these instructions to replace the part.

Hardware Service Manager — Verify

Use the Hardware Service Manager to verify communications or devices.

About this task

To verify communications or devices on any model using the Hardware Service Manager *Verify* option, perform the following procedure:

Note: Before running a verification test, ensure that the customer is not using the resource you want to test and that all communication jobs on the resource to be tested are ended.

1. From the Start a Service Tool display, select the *Hardware Service Manager* option.
2. From the Hardware Service Manager display, select the *Logical hardware resources* option.
3. From the Logical Hardware Resources display, select the *System bus resources* option.
This display lists all the I/O processors.
4. Select the *Resources associated with IOP* option for the attached IOP in the list.
5. Select the *Verify* option for the communications, tape, optical storage unit, or File Server adapter that you want to test.
6. When the test completes, the system responds with either a Test is successful message or a Test failed message.

This ends the procedure.

Results

Notes:

1. Hardware units might perform automatic self-tests when they are powered on.
2. You can test some workstations by using the *Test Request* function key while the operating system Sign On display is shown.
3. See the specific device information for possible off-line tests that you can run.

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.

About 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. 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 "Using the HMC to perform a slow boot" on page 154.
 - 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. 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: .
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 contact your service provider for assistance..
 - 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 on page 153.

Yes: Go to step 7.

6. Did the *Testing Complete, No trouble was found* message appear?
 - **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
 - **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**. Press Enter.

Tip: This action changes the indicator light for the part from the fault state to the normal state.
Go to step 9

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:
 - “Changing service indicators” on page 155

Using the HMC to perform a slow boot

Learn how to perform a slow boot using the HMC.

About this task

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

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

1. Record any reference codes appearing on the control panel or HMC. For details, see Collecting reference codes and system information.
2. Shut down all logical partitions and the server.
3. In the navigation area, select **Systems Management** → **Servers**.
4. Select the server you want to perform a slow boot on.
5. In the **Tasks** portion of the content area, select **Properties**.
6. Click the **Power-On Parameters** tab.
7. Record the current boot setting in the Power-on speed override box.
8. Select **slow** in the Power-on speed override list.

Note: These settings will apply to all future boots. After you complete the service action, change the settings back to what you recorded in step 7.

9. Click **OK**.
10. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Using the control panel to collect reference codes and system information:

When selected, functions 11 - 20 on the control panel display reference codes and system information.

About this task

Note: Ensure you have a printed copy of the appropriate problem reporting form to document the information you collect here.

To collect reference codes and system information using the control panel, perform the following steps:

1. On the control panel, press the increment button until function 11 is shown on the function/data display.
2. Press the middle button.
3. Record the data.
4. Repeat steps 1 - 3 for functions 12 - 20, until you have recorded the machine type, model, and serial number shown by function 20.

Results

Notes:

1. If 11 is shown in the function/data display on the control panel display, the numbers that follow are the reference codes.

2. If a number other than 11 is shown in the function/data display, the number might not indicate a problem with the system. These reference codes might indicate functions you select from the control panel display.
3. If you have a console with Type and Reference Code columns on it, record the data under the Type column as the first 4 characters of function 11 on the problem reporting form. If an A, B, C, or D is displayed as the first character in the Type column, use the data in the Reference Code column as the last 4 characters of function 11.

Changing service indicators

Turn off the system attention indicator, enable enclosure indicators, change indicators by location code, and perform an LED test on the control panel.

The service indicators alert you that the system requires attention or service. It also provides a method for identifying a field-replaceable unit (FRU) or a specific enclosure within the system.

A hierarchical relationship exists between FRU indicators and enclosure indicators. If any FRU indicator is in an *identify* state, then the corresponding enclosure indicator will change to an *identify* state automatically. You cannot turn off the enclosure indicator until all FRU indicators within that enclosure are in an *off* state.

Turning off the system attention indicator:

The system attention indicator provides a visual signal that the system as a whole requires attention or service.

About this task

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

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

- Administrator
- Authorized service provider

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

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

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.

About this task

To verify the newly installed or replaced part, continue with “Verify an installed part using stand-alone diagnostics” on page 156.

Verify an installed part using 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.

About 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 stand-alone diagnostics from a Network Installation Management server” on page 157.

Prerequisites

- If this server is directly attached to another server or attached to a network, be sure communication with the other servers is stopped.
- stand-alone diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- 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 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 “Accessing the ASMI without an HMC” on page 103 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 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.

Note: If you received an SRN or any other reference code when you attempted to start the system, contact your service provider for assistance..

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.

Running stand-alone diagnostics from a Network Installation Management server

If you have AIX installed but it cannot be started, or you have Linux installed, you can run the diagnostics from a Network Installation Management (NIM) server.

About this task

Note: Only perform this procedure if you are directed from another procedure or by your next level of support.

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

A client system connected to a network with a NIM server can boot stand-alone diagnostics from the NIM server if the client-specific settings on both the NIM server and client are correctly configured.

Notes:

- For NIM clients that have adapters that would typically require that supplemental media be installed when stand-alone diagnostics are run from CD, the support code for these adapters must be installed into the directory pointed to by the NIM SPOT from which you want to boot that client. Before running stand-alone diagnostics on these clients from the NIM server, the NIM server system administrator must ensure that any needed support for these devices is installed on the server.
- All operations to configure the NIM server require root user authority.
- If you replace the network adapter in the client, the network adapter hardware address settings for the client must be updated on the NIM server.
- Ensure that the **Cstate** for each stand-alone diagnostics client on the NIM server is kept in the *diagnostic boot has been enabled* state.
- On the client system, the NIM server network adapter should be put in the bootlist after the boot disk drive. This allows the system to boot in stand-alone diagnostics from the NIM server if there is a problem booting from the disk drive.

Configuring the NIM server

For information about performing the following tasks, refer to the "Performing advanced NIM configuration tasks" chapter of the AIX Installation and Migration guide. Contact your next level of support to obtain the guide.

- Registering a client on the NIM server
- Enabling a client to run diagnostics from the NIM server

To verify that the client system is registered on the NIM server and the diagnostic boot is enabled, run the command from the command line on the NIM server: `lsnim -a Cstate -z ClientName`. Refer to the following table for system responses.

Note: The ClientName is the name of the system on which you want to run stand-alone diagnostics.

Table 5. Verification that the client system is registered on the NIM server and the diagnostic boot is enabled

System response	Client status
#name:Cstate:ClientName:diagnostic boot has been enabled:	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.
#name:Cstate:ClientName:ready for a NIM operation: or #name:Cstate:ClientName:BOs installation has been enabled:	The client is registered on the NIM server but not enabled to run diagnostics from the NIM server. Note: If the client system is registered on the NIM server but Cstate has not been set, no data will be returned.
0042-053 lsnim: there is no NIM object named "ClientName"	The client is not registered on the NIM server.

Configuring the client and running the stand-alone diagnostics from a NIM server

Perform the following steps to run stand-alone diagnostics on a client from the NIM server:

1. Let the system administrator and system users know that the system unit might be shut down.
2. Stop all programs including the AIX or Linux operating system. If you need help, contact the system administrator.
3. Remove all tapes, diskettes, and CDs.
4. Choose from the following options:
 - If you are running stand-alone diagnostics in a full system partition profile, verify with the system administrator and system users that the system unit can shut down using the shutdown command. Then power down the system.
 - If you are running on a logically partitioned system, make sure the CD drive is available to the partition used to run stand-alone diagnostics. Verify with the system administrator and system users using that partition that all applications on that partition must be stopped, and that the partition will be restarted. Stop all programs on that partition, including the operating system.
5. Choose from the following options:
 - If you are in a full system partition, power on the system unit to run stand-alone diagnostics.
 - If you are in a logically partitioned system, restart the partition to run stand-alone diagnostics.
6. When the keyboard indicator is displayed (the word *keyboard* on an HMC virtual terminal window or the keyboard icon on a graphical display) press the number 1 key on the keyboard to display the SMS menus.
7. Enter any requested passwords.
8. Select **Set Up Remote IPL** (Initial Program Load).
9. Enter the client address, server address, gateway address, if applicable, and subnet mask. If there is no gateway between the NIM server and the client, set the gateway address to 0.0.0.0.

To determine if there is a gateway, either ask the system network administrator or compare the first three octets of the NIM server address and the client address. If they are the same, (for example, if

- the NIM server address is 9.3.126.16 and the client address is 9.3.126.42, the first 3 octets (9.3.126) are the same), then set the gateway address in the Remote IPL field to 0.0.0.0.
10. If the NIM server is set up to allow pinging from the client system, use the Ping test option in the Remote IPL option to verify that the client system can ping the NIM server.
 11. Under the Ping test option, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping returns with an OK prompt, the client is prepared to boot from the NIM server. If ping returns with a FAILED prompt, the client cannot proceed with the NIM boot.
 12. Return to the SMS main menu screen.
 13. Select **Select Boot Options** → **Install or Boot a Device** → **Network**.
 14. Record the current bootlist settings. You will need to set the bootlist back to the original settings after running diagnostics from the NIM server.
 15. Change the bootlist so the network adapter attached to the NIM is first in the bootlist.
 16. Set the network parameters for the adapter from which you want to boot.
 17. Exit completely from SMS. The system will start loading packets while doing a bootp from the network.
 18. Follow the on-screen instructions.
 - If Diagnostic Operating Instructions Version *x.x.x* displays, stand-alone diagnostics have installed successfully.
 - If the AIX login prompt displays, stand-alone diagnostics did not load. Continue with step 19.
 19. If the diagnostics did not load, check the following items:
 - The bootlist on the client might be incorrect.
 - **Cstate** on the NIM server might be incorrect.
 - Network problems might be preventing you from connecting to the NIM server.
 - Verify the settings and the status of the network. Contact your next level of support to obtain the guide.
 20. After running diagnostics, restart the system and use SMS to change the IP settings and bootlist sequence back to the original settings.

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” on page 161 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” on page 160. **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.

Activating and deactivating LEDs

Use this procedure to activate or deactivate LEDs using Service Focal Point for the HMC.

About this task

Choose from the following:

- “Deactivate a system attention LED or partition LED”
- “Activate or deactivate identify LED”

Deactivate a system attention LED or partition LED:

About this task

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

1. In the navigation area, open **Systems Management**.
2. Open **Servers** and select the appropriate system.
3. In the content area, check the box for the appropriate Partition.
4. Select **Tasks**, then **Operations**, and then **Manage Attention LED**.
5. Select the appropriate Partition.
6. Select **Deactivate System Attention LED** from the **Action** menu. A confirmation window is displayed that provides the following information:
 - A verification that the system attention LED was deactivated.
 - An indication that there still might be open problems within the system.
 - An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the **Partition Operations** menu. A confirmation window is displayed that provides the following information:
 - A verification that the logical partition LED was deactivated.
 - An indication that there still might be open problems within the logical partition.
 - An indication that you cannot activate the logical partition LED.

Activate or deactivate identify LED:

About this task

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

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

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

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

1. In the navigation area, open **Systems Management**.
2. Select **Servers**.
3. In the content area, check the box for the appropriate System.
4. Select **Tasks**, then **Operations**, then **LED Status**, and then **Identify LED**.
5. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
6. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, select **Selected** → **List FRUs**.
7. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Viewing serviceable events

Use this procedure to view a serviceable event, including details, comments, and service history.

About this task

To view serviceable events and other information about the events, you must be a member of one of the following roles:

- Super administrator
- Service representative
- Operator
- Product engineer
- Viewer

To view serviceable events, follow these steps:

1. In the navigation area, select **Service Management**.
2. Select **Manage Serviceable Events**.
3. Select the criteria for the serviceable events that you want to view, and click **OK**. The Serviceable Event Overview window opens. The list shows all serviceable events that match your selection criteria. You can use the menu options to perform actions on the serviceable events.
4. Select a line in the Serviceable Event Overview window, and select **Selected** → **View Details**. The Serviceable Event Details window opens, showing detailed information about the serviceable event. The upper table shows information, such as problem number and reference code. The lower table shows the field replaceable units (FRUs) associated with this event.
5. Select the error for which you want to view comments and history, and follow these steps:

- a. Select **Actions** → **View Comments**.
 - b. When you are finished viewing the comments, click **Close**.
 - c. Select **Actions** → **View Service History**. The Service History window opens, showing service history associated with the selected error.
 - d. When you are finished viewing the service history, click **Close**.
6. When you are finished, click **Cancel** twice to close the Serviceable Event Details window and the Serviceable Event Overview window.

Verify an installed feature or replaced part on a Virtual I/O Server (VIOS) system or logical partition

If you installed feature or replaced a part you might want to use the tools in VIOS 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.

About this task

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:

- Verify the installed feature using VIOS
- Verifying the replaced part using VIOS

Verify the installed feature using VIOS:

1. Log in as root user.
2. At the command line, type `diagmenu` 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. 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 VIOS

To verify the operation of a newly installed feature or replacement part, follow these steps:

1. Did you replace the part using either VIOS or the online diagnostics service aid's concurrent (hot-swap) service operation?
 - No:** Go to step 2.
 - Yes:** Go to step 5 on page 163.
2. Is the system powered off?
 - Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see "Using the HMC to perform a slow boot" on page 154.

No: Go to step 4.

3. Start the system and wait until the VIOS operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.

Did the VIOS 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. 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: .
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 contact your service provider for assistance..
- f. If no SRN is shown, go to 5.

5. Test the part by doing the following:

- a. At the command line, type `diagmenu` and press Enter.
- b. From the **Function Selection** menu, select **Advanced Diagnostics Routines**. Press Enter.
- c. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
- d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced, and any devices that are attached to the part you replaced. Press Enter.

Did the **Resource Repair Action** menu appear?

No: Go to step 6.

Yes: Go to step 7.

6. Did the *Testing Complete, No trouble was found* message appear?

- **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
- **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select `sysplanar0`. Press Enter.

Tip: This action changes the indicator light for the part from the fault state to the normal state.
Go to step 9 on page 164

7. When a test is run on a resource in system verification mode, and that resource has an entry in the VIOS 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 VIOS 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 VIOS 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 VIOS 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:
 - “Changing service indicators” on page 155

Gain access to the model 04E/8A, 03E/4A control panels

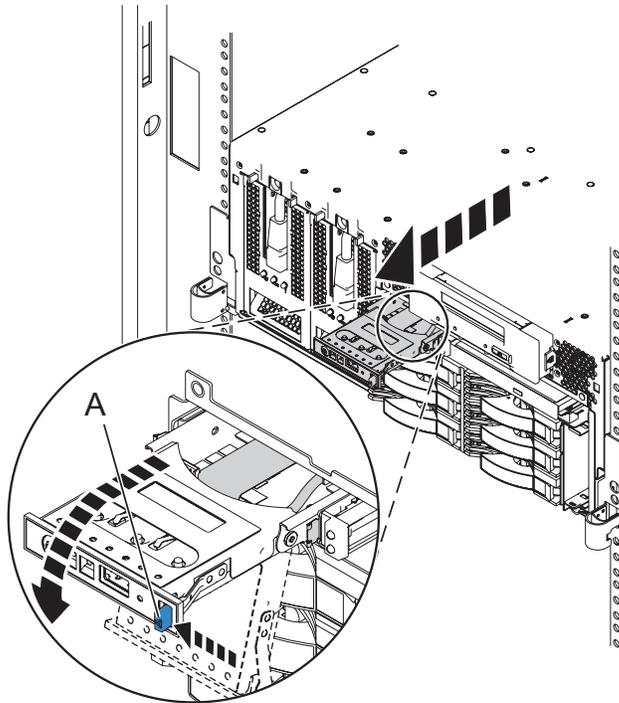
Since only part of the control panel is visible from the front of the server, you can use this procedure to gain access to all of the control panel’s features, including the display.

About this task

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.

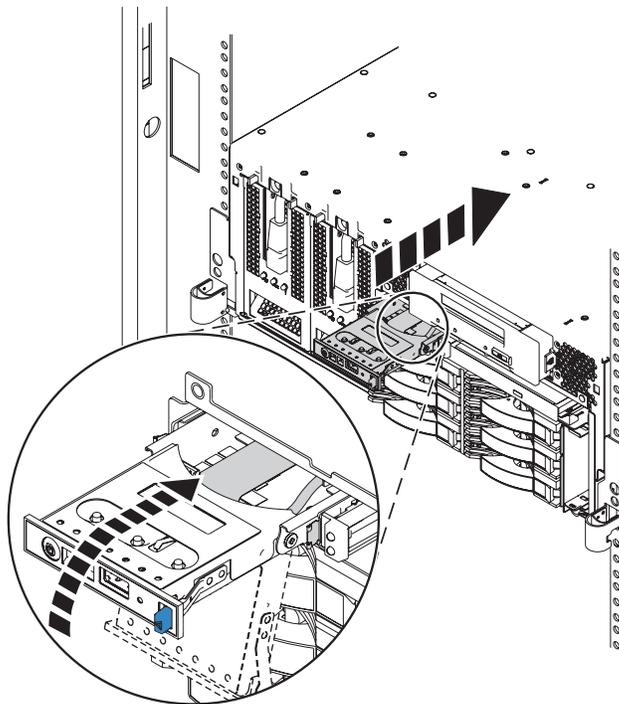
To access all of the control panel’s features, complete the following steps:

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



IPHAJ870-0

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.



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Appendix. Accessibility features

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generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM® is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

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European Community contact:
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Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

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