D20 Expansion Unit Removal and Replacement Procedures

BULL

ESCALA

D20 Expansion Unit Removal and Replacement Procedures

Hardware

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Contents

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.

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

German safety information

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

Laser safety information

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

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

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

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

(C026)

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

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

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

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

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

The equipment is suitable for installation in the following:
* Network telecommunications facilities
* Locations where the NEC (National Electrical Code) applies

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

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

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

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

0595, 5095, and 7311-D20 removal and replacement procedures

Use the removal and replacement procedures when you repair, maintain, or exchange system parts for your 0595, 5095, or 7311-D20 expansion unit.

Before you begin a replacement, perform these tasks:

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

DANGER

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

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

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

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

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

  (D005)

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

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

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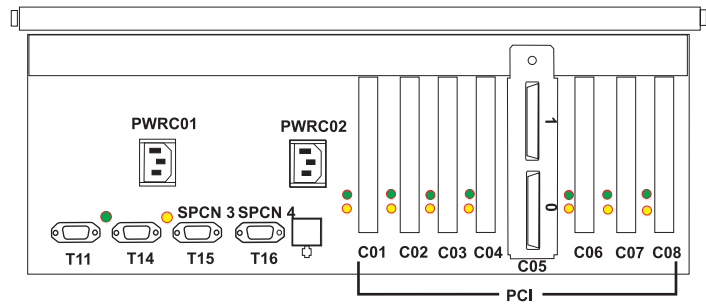
External cables

Use this procedure to service the external cables.

1. **Remove the external cables**

Use the graphic to locate the cable and remove it.

2. **Install the external cables**

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

Internal cables

Use this procedure to service the internal cables.

1. **Remove the internal cables**

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

2. **Install the internal cables**

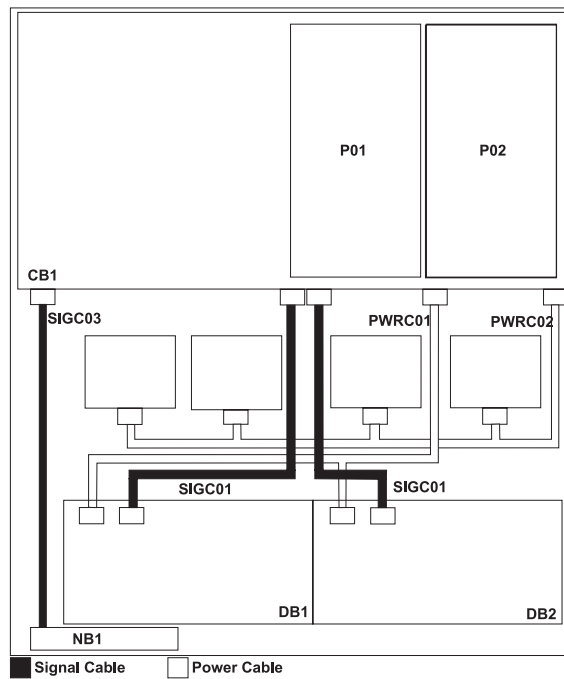1. Locate the location where the cable is to be installed and install it.
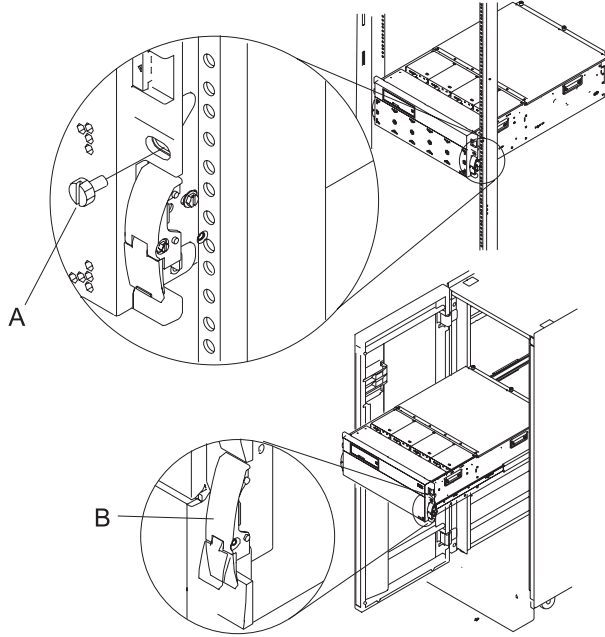2. Install the power cord.

Air moving device (fan)

Use this procedure to service the air moving device (fan).

1. **Place unit into service position**

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

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews **(A)** at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches **(B)**.
4. Pull the system unit out from the rack until the rails are fully extended.
5. Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped.
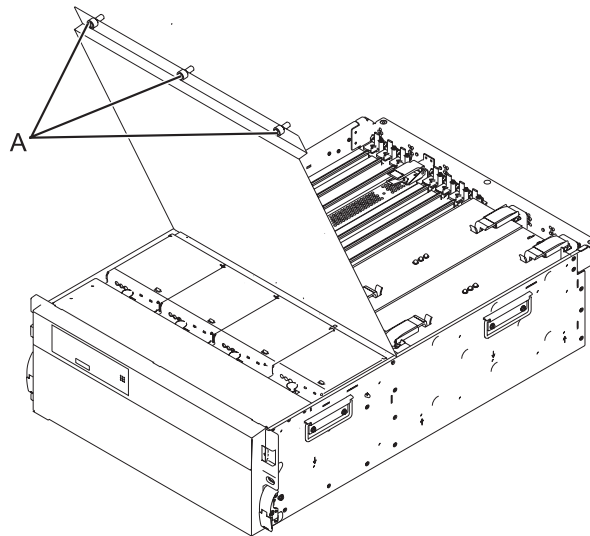
2. **Open the service access cover**

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews **(A)** located on the rear of the cover. Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.
3. To open the service access cover, lift the cover up from the back edge. The hinges allow the service access cover to swing open to about 170 degrees. Do not force the cover to come to a rest on top of the cooling blowers.

   Note: When you open the service access cover, ensure you have enough height clearance.
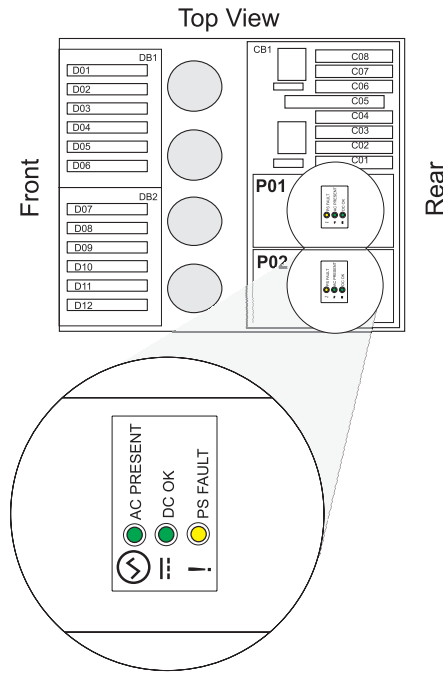
3.

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

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

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

Top View

4. **Close the service access cover**

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

5.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must also be true:
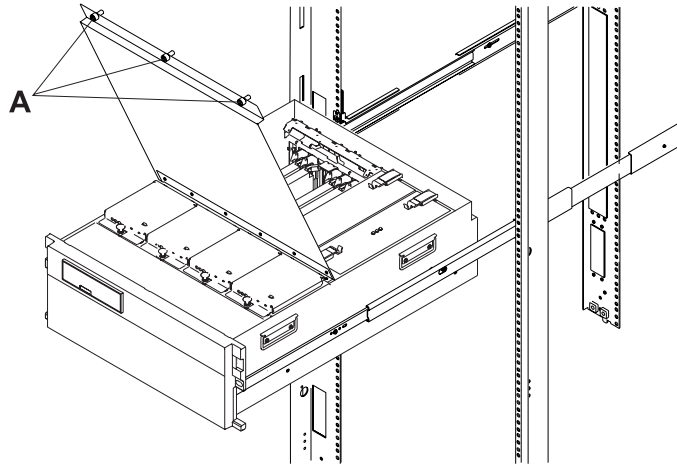
- Air moving devices (AMDs) must already be installed in all AMD locations. Each of these AMDs has a green LED and an amber LED. The LEDs must be set as follows:

- Green - on

- Amber - on or off

If any of these conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.
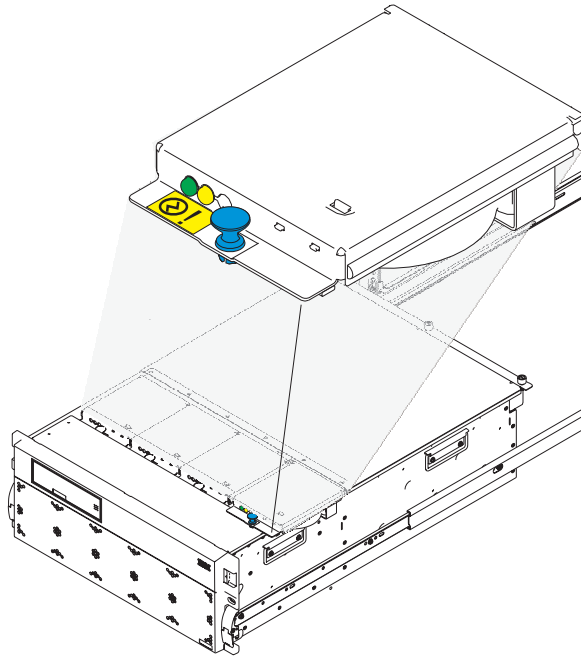
6.

Select an action:

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

7.

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

8.

The component will be serviced non-concurrently.

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

9. **Remove the air moving device (AMD)**

1. Pull the snap button **(A)** on the front of the AMD casing.
2. Remove the AMD by pulling it straight out of the system.
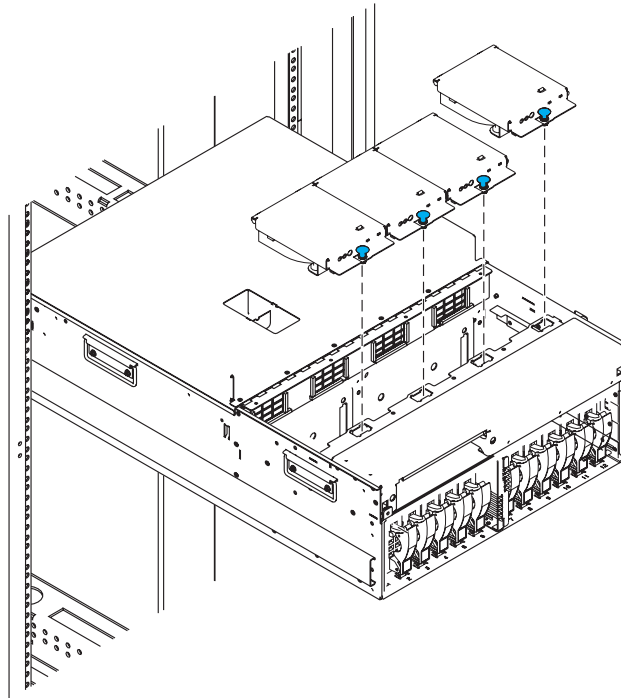
10. **Install the air moving device (AMD)**

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

A

11. **Place unit into operating position**

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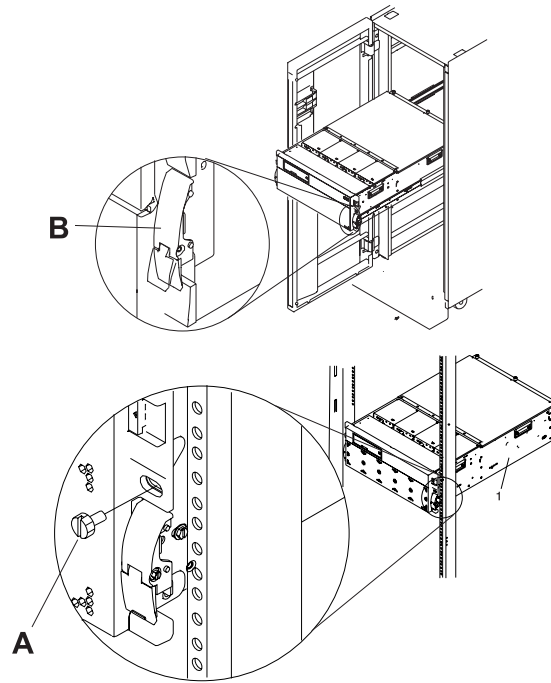
Device board

Use this procedure to service the device board.

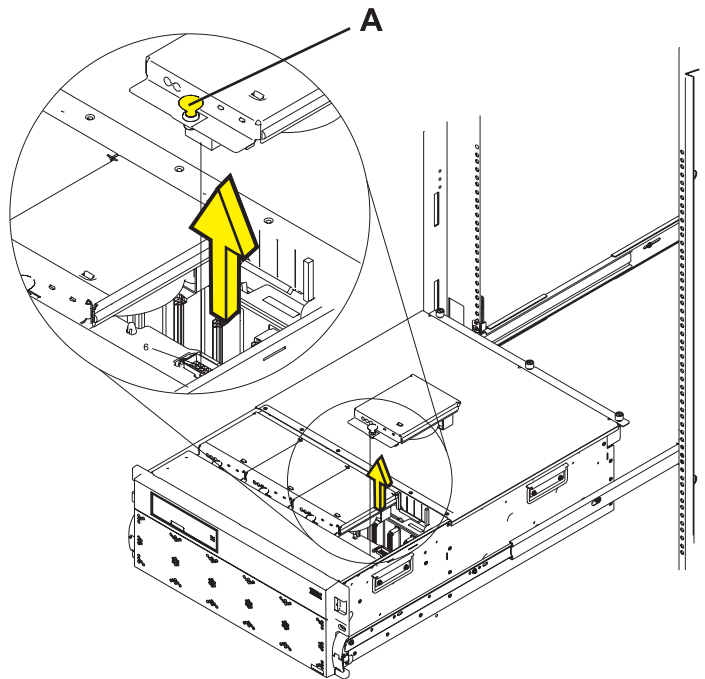1. **This component is serviced nonconcurrently.**

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

2. **Place unit into service position**

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

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews **(A)** at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches **(B)**.
4. Pull the system unit out from the rack until the rails are fully extended.
5. Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped.

3. **Remove the air moving devices (AMDs)**

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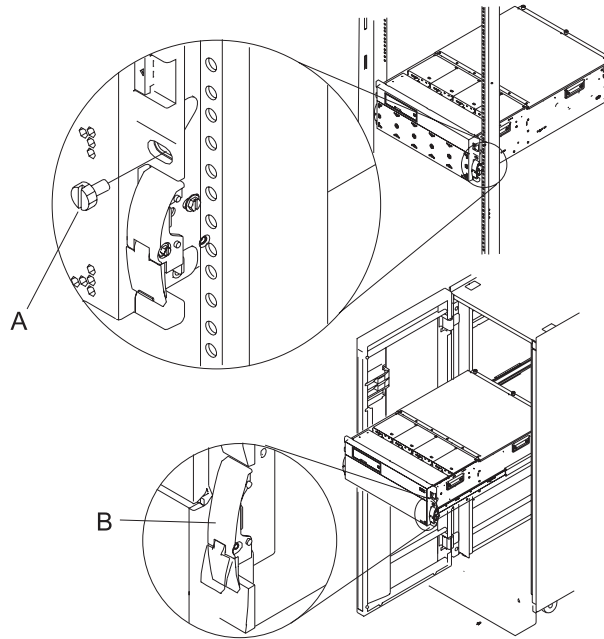2. Remove the AMD by pulling it straight out of the system.
3. Repeat these steps until all AMDs have been removed from the system.
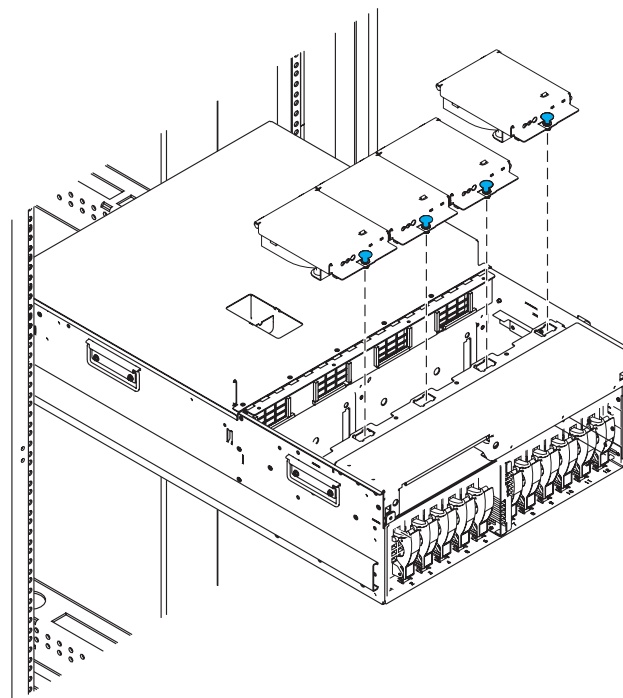
4. **Remove the front bezel**

1. Open the front rack door.
2. Simultaneously press in both bezel-release tabs **(A)**.
3. Pivoting the bezel from the bottom, swing the top of the bezel out.
4. Pull the bottom of the bezel up, and then away from the subsystem chassis **(B)**. This action releases the two tabs **(C)** located on the bottom of the bezel.
5. Put the bezel in a safe place.
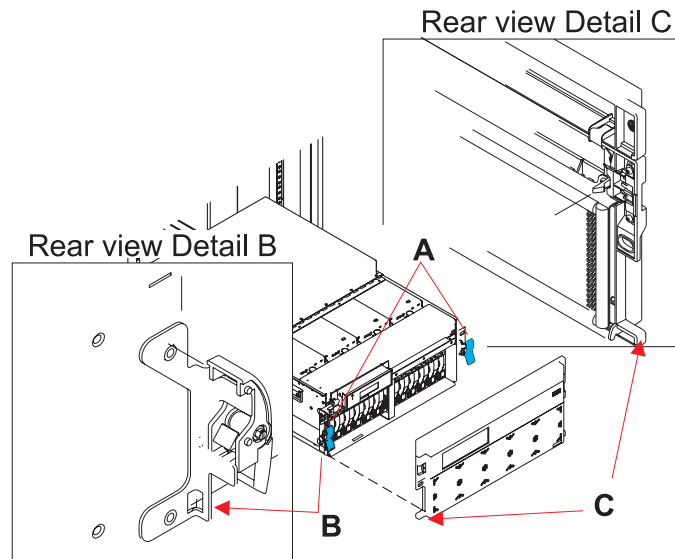
5. **Remove the disk units**

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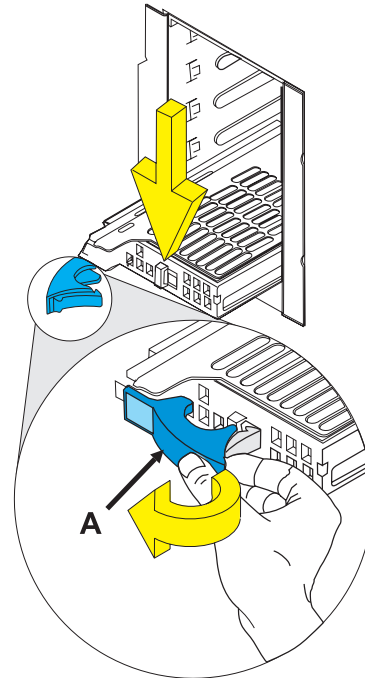
6. **Remove the disk unit cage**

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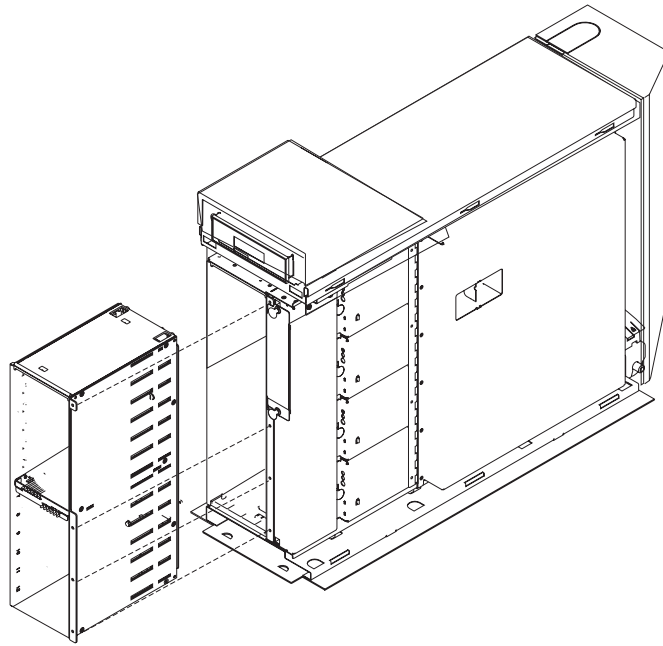
7. **Remove the device board**

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

8. **Install the device board**

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

A
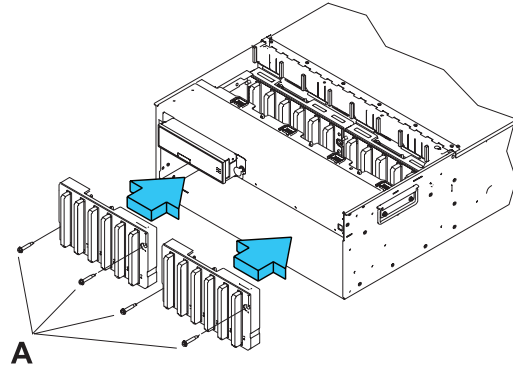
9. **Install the disk unit cage**

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

A
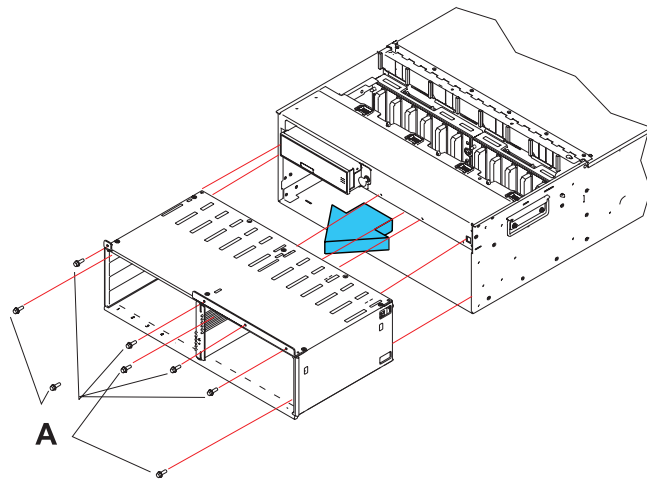
10. **Install the disk units**

1. Install the disk unit in the proper location in the disk unit enclosure by sliding it in with the handle **(A)** out, then pushing the handle towards the unit to lock it into place.

2. Repeat these steps until all disk units have been installed.
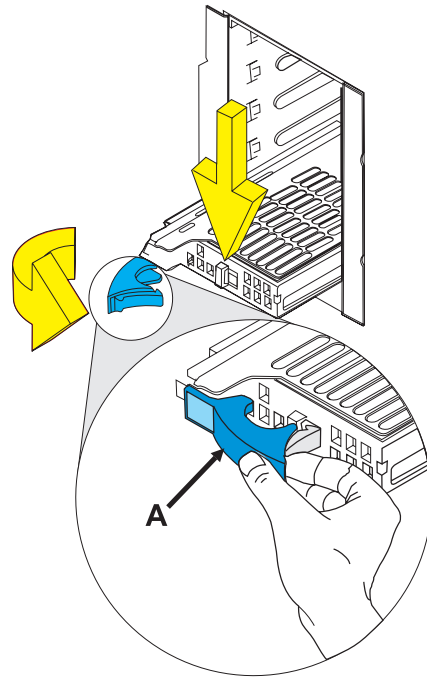
11. **Install the front bezel**

1. Open the front rack door.

2. Insert the two tabs **(C)** located on the bottom edge of the bezel into their locking slots **(B)**, located on the chassis.

3. Pivot the front bezel up toward the top of the chassis.

4. Align the release tabs **(A)** to the matching slots located on the front of the subsystem chassis.

5. Gently push the release tabs into the slots until the bezel seats against the front of the subsystem.

6. If the subsystem is in the service position, put the subsystem back into the operating position.

7. Reconnect the power source.

8. Close the rack door.
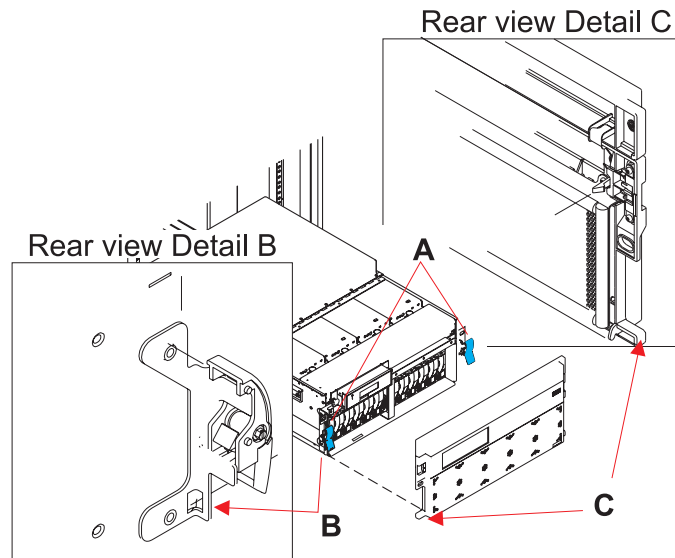
12. Install the air moving devices (AMDs)

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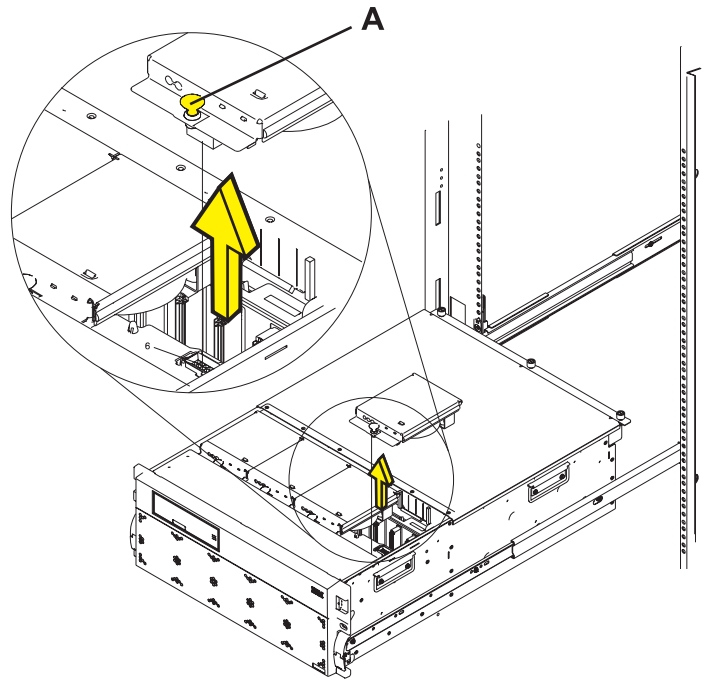
13. Place unit into operating position

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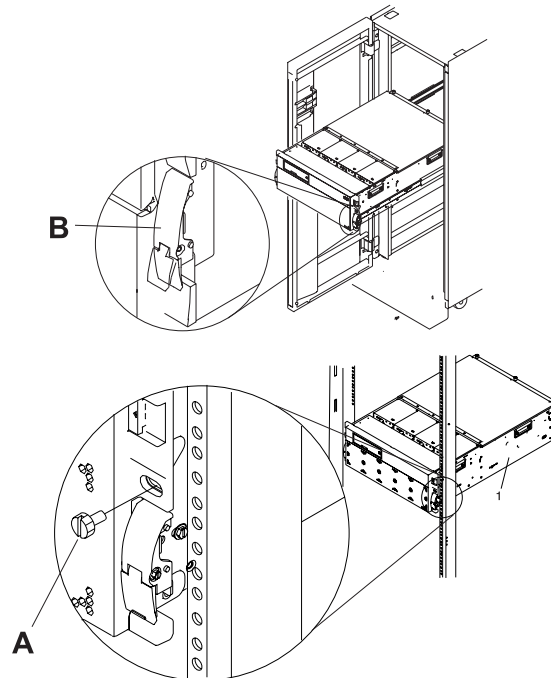
Disk drive

Use this procedure to replace the disk drive.

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

1.

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

Yes	No
↓	Go to Replace the disk drive nonconcurrently.

2.

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

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

For Linux, go to Replace the disk drive using Linux .

For IBM i, go to Replace the disk drive using IBM i.

Replacing the disk drive using AIX

Use this procedure to remove and replace a disk drive concurrently with the AIX operating system.

1.

Access the unit by:

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

2.
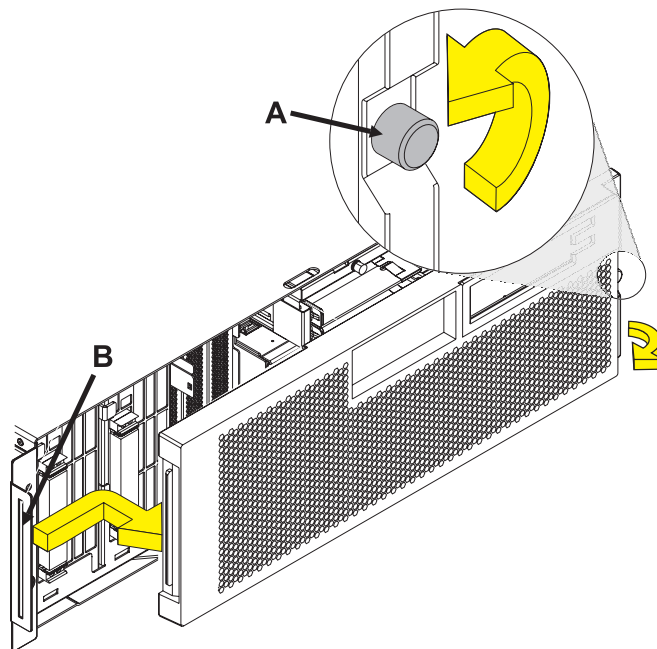
Remove the disk drive as a resource:

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

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

    The disk drive slot exits the Identify state.
11. On the Identify and Remove Resources display, select **Remove**.

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

    The disk drive slot enters the Remove state and power is removed from the slot. The concurrent maintenance light for the slot begins flashing rapidly.
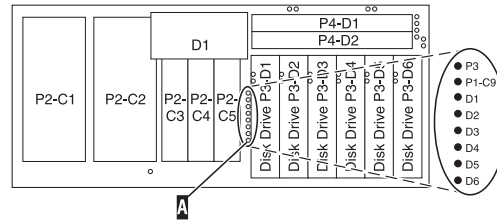
Note: If the disk drive slot is not in the Remove state, contact your next level of support.

3.

Remove the Disk Drive by:

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

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

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

4.

Install the bezel on the new disk drive:

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

   Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.

3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.

4. Attach the disk drive bezel **(A)** to the replacement disk drive as shown.

5. Press in and then tighten the thumbscrew **(B)** to secure the bezel to the disk drive.

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5.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.
   Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

6.

Add the new disk drive as a resource:

1. Press Enter.

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

7.

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

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

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

8. Go to Verifying a repair. **This completes this procedure.**

Replacing the disk drive using Linux

This procedure is used to replace a disk drive in a location that is controlled by a system or logical partition that is running the Linux operating system.

Preparing to remove the disk drive

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

```
                             Kernel Messages Log


Select one of the following:


    1. View most recent ipr error messages
    2. View ipr error messages
    3. View all kernel error messages
    4. View iprconfig error messages
    5. Set root kernel message log directory
    6. Set default editor
    7. Restore defaults
    8. View ipr boot time messages



Selection:

e=Exit
```
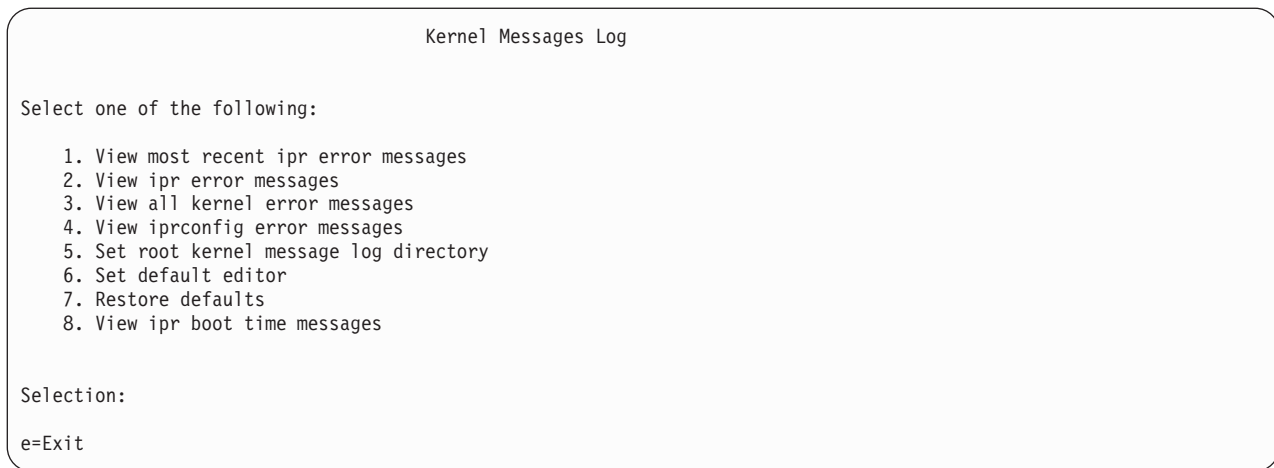
Figure 1. Kernel Messages Log

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 code phrase:

   `ls -ld /sys/class/scsi_host/host#/device`

   where # is the SCSI host number. Press Enter.

9. Record the PCI location information.

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

10. Type `iprconfig` on the command line and press Enter.

    The IBM Power RAID Configuration Utility display is shown.

11. Select **Display hardware status** from the IBM Power RAID Configuration Utility display. Press Enter.

    The Display Hardware Status display is shown.

```
                     Display Hardware Status

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

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


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

Figure 2. 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
                                                    More...
Press Enter to Continue

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

Figure 3. Example Disk Hardware Resource Information Details display

15. Record the physical location information.

16. Return to the IBM Power RAID Configuration Utility display.

Removing the disk drive

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

```
                    Concurrent Device Remove

Choose a single location for remove operations
  1=Select

OPT Name   PCI/SCSI Location          Description               Status
--- ------ -------------------------- ------------------------- -----------------
    sdc    0000:41:01.0.1/0:8:0       Physical Disk             Active
           0000:41:01.0.1/0:5:                                  Empty
    sdb    0000:41:01.0.1/0:4:0       Physical Disk             Active
    sda    0000:41:01.0.1/0:3:0       Physical Disk             Active
           0000:41:01.0.1/1:8:                                  Empty
    sdf    0000:41:01.0.1/1:5:0       Physical Disk             Active
    sde    0000:41:01.0.1/1:4:0       Physical Disk             Active
    sdd    0000:41:01.0.1/1:3:0       Physical Disk             Active
           0001:61:01.0.2/0:8:                                  Empty
    sdh    0001:61:01.0.2/0:9:0       Physical Disk             Active
    sdg    0001:61:01.0.2/0:3:0       Physical Disk             Active
```

Figure 4. Example Concurrent Device Remove display

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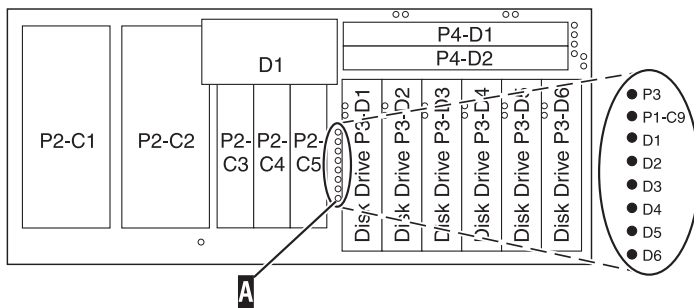
5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

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

6. The Complete Device Concurrent Remove display is shown.

   Attention:
   - Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (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 5 on page 23 or Figure 6 on page 23. If the handle is not all the way out, the disk

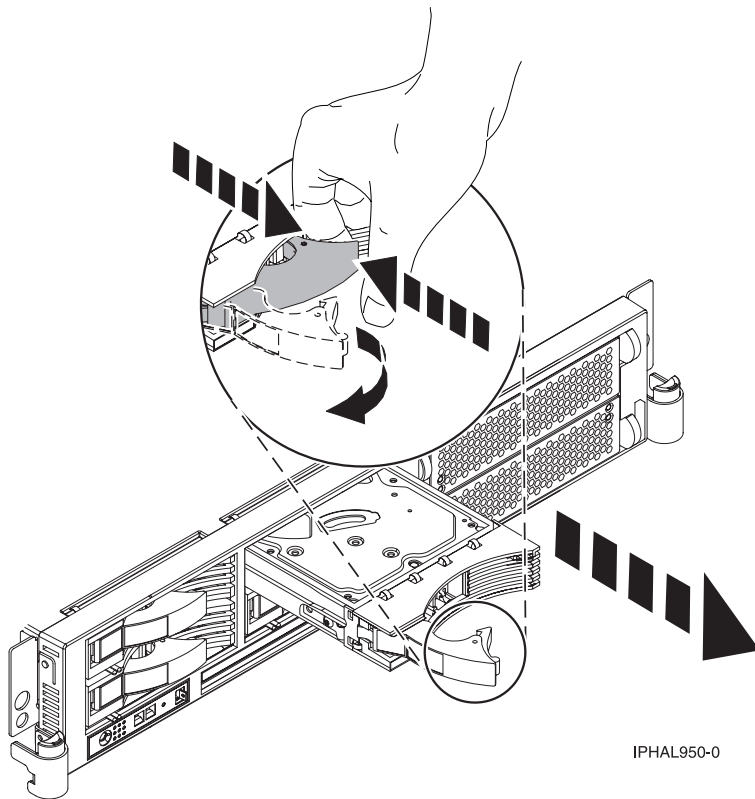drive will not slide out of the system or expansion unit.

Figure 5. Removing a disk drive from the system unit
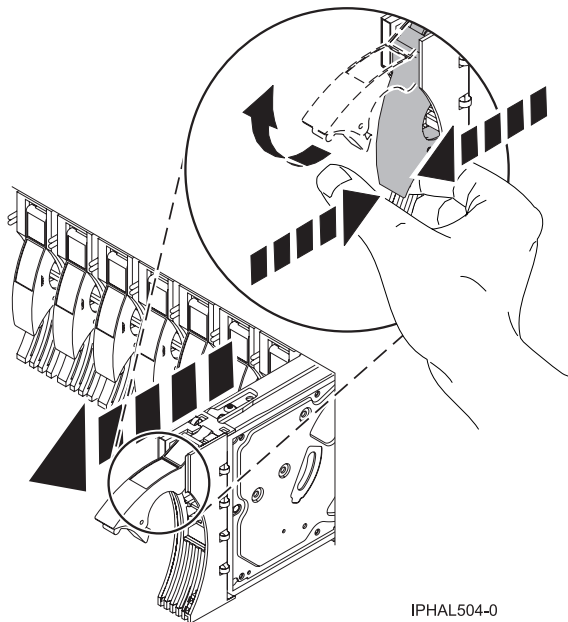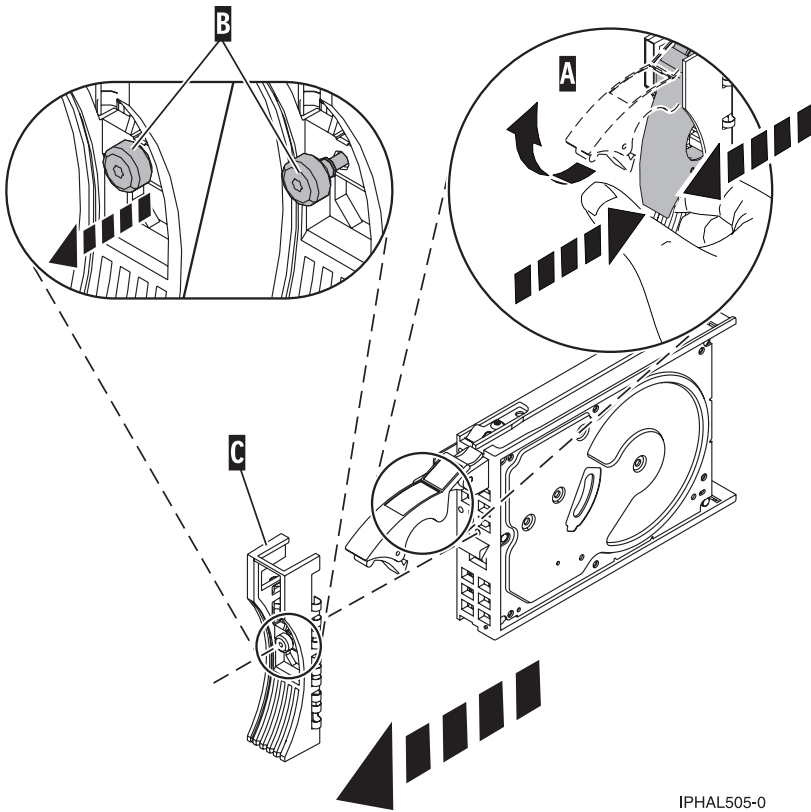

Figure 6. Removing a disk drive from the system unit

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. 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.


Figure 7. Removing a disk-drive bezel

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

Replacing 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. 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.

Figure 8. Attaching a bezel to the disk drive
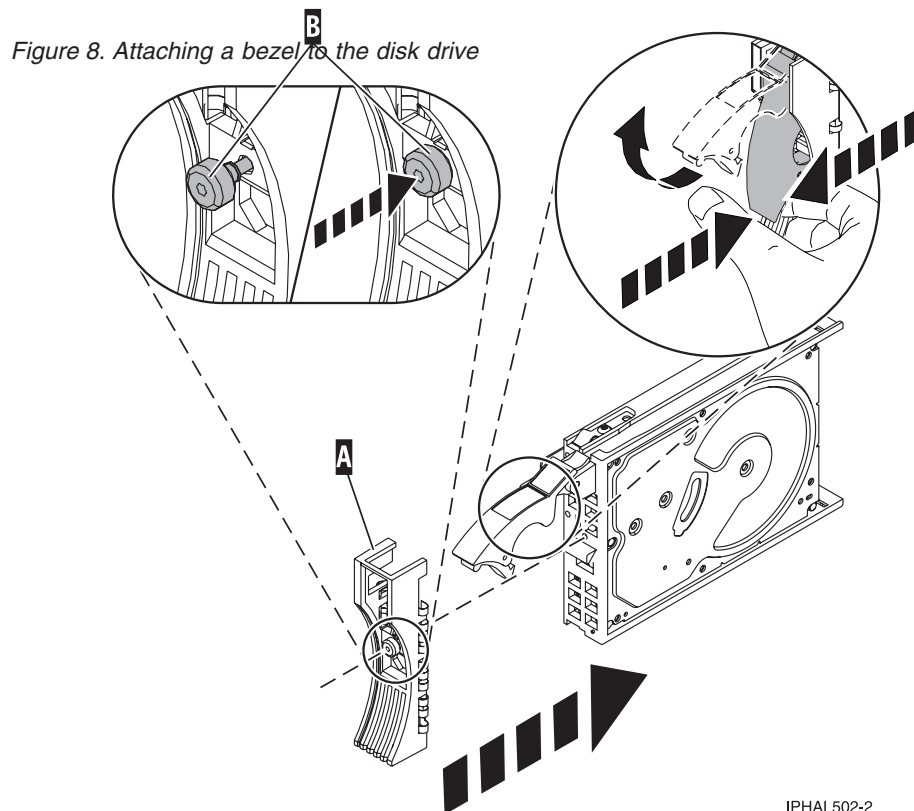
5. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
6. From the Work with Disk Unit Recovery display, select **Concurrent add device**. Press Enter.

   A Concurrent Device Add display similar to the following is shown.

```
                         Concurrent Device Add

Choose a single location for add operations
  1=Select

OPT Name   PCI/SCSI Location          Description              Status
--- ------ -------------------------- ------------------------ -----------------
           0000:41:01.0.1/0:5:                                 Empty
           0000:41:01.0.1/1:8:                                 Empty
           0001:61:01.0.2/0:8:                                 Empty
```

Figure 9. Example Concurrent Device Add display

7. Type option 1 (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 10 on page 26 or Figure 11 on page 26.
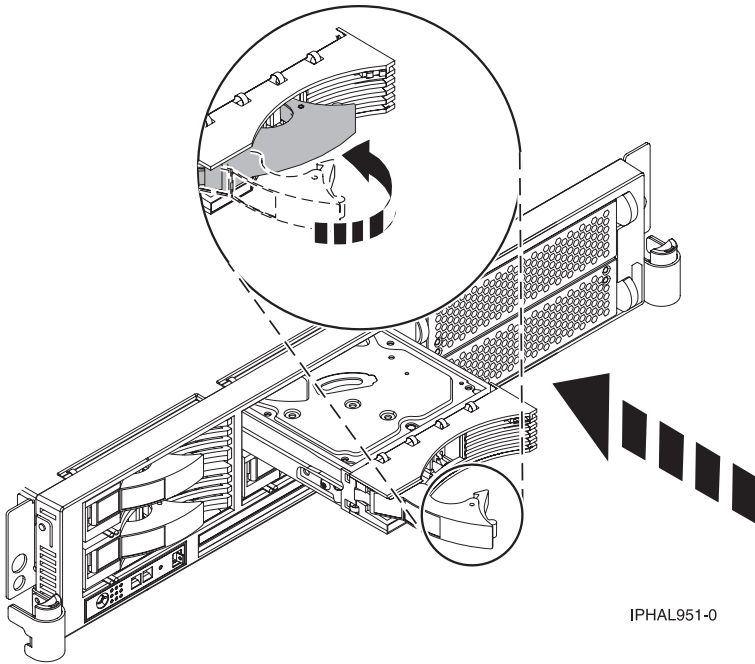
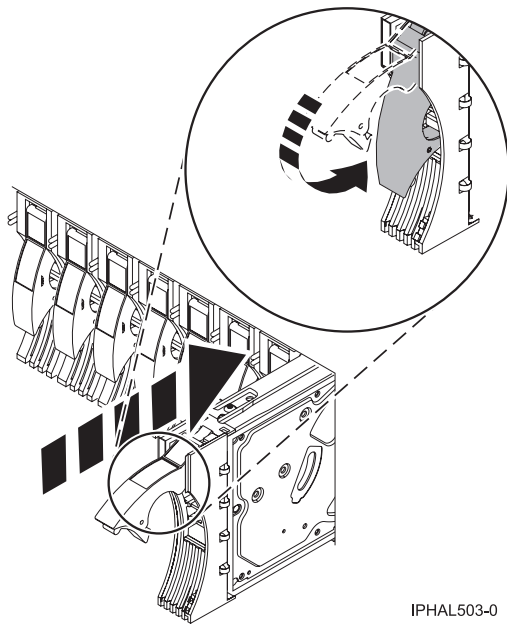*Figure 10. Installing a disk drive in the system unit*

Figure 11. Installing a disk drive in the system unit

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 "Rebuilding data on a replacement disk drive using Linux" on page 36.

13. Go to Verifying a repair. **This completes this procedure.**

Replacing the disk drive nonconcurrently

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

1.

The component will not be serviced concurrently. If this system is powered on, power it off before continuing.
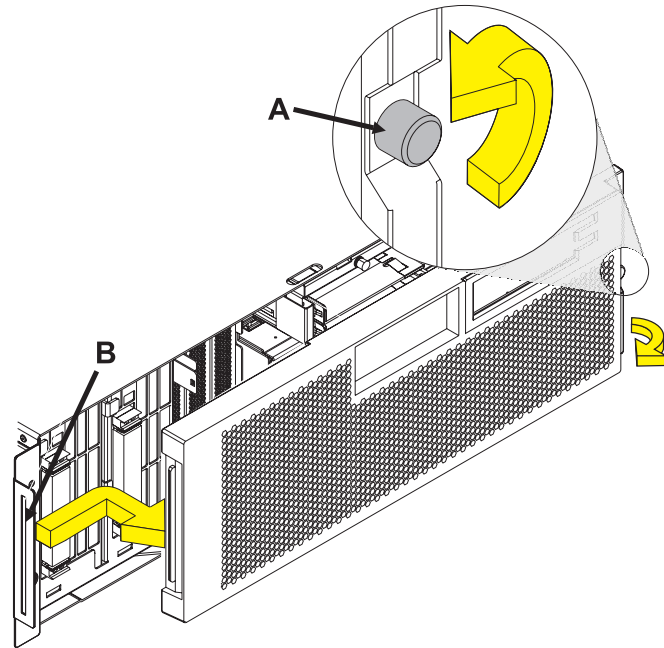
When the system is powered off, disconnect the AC input source from the enclosure being serviced. Do not apply power to the enclosure until directed to do so in this procedure.

2.

Access the unit by:

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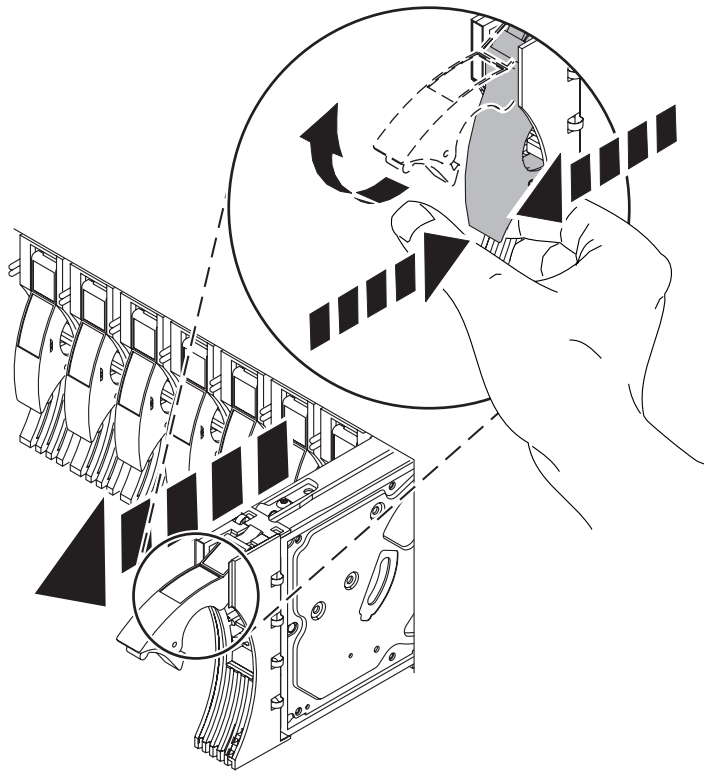
3.

Remove the disk drive by:

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

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

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

4.

Install the bezel on the new disk drive:

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

   Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.

3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.

4. Attach the disk drive bezel **(A)** to the replacement disk drive as shown.

5. Press in and then tighten the thumbscrew **(B)** to secure the bezel to the disk drive.

5.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.

2. Slide the disk drive into the system until it stops.

3. Push the disk drive handle in until it locks.
   Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

4. Reconnect the power source.

5. Power on the unit, then go to Verifying a repair. **This completes this procedure.**.
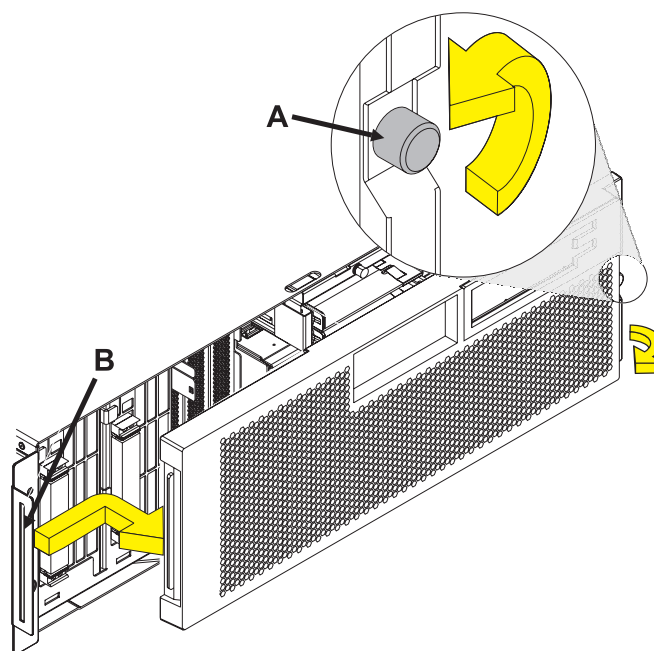
Replacing the disk drive using IBM i

Use this procedure to remove and replace a disk drive concurrently with IBM i.

1.

Access the unit by:

1. Open the front rack door.

2. Loosen the thumbscrew **(A)** on the right side of the cover.

3. Slide the cover to the right and remove it from the system unit slot **(B)**.

2.

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

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

No: Continue with the next step.

Yes: If the disk drive is mirrored, record the status of both disk drives in the mirrored pair and go to step 6 on page 31. If the disk drive is parity protected, go to step 4 on page 30.

3.

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

1. Sign on the operator console with at least service level authority.
2. Type strsst on the command line of the IBM i session and press Enter.
3. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.
4. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.
5. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
6. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.

   A list of each auxiliary storage pool (ASP) displays, showing the disk drives that are members of the ASPs..
7. Is the status of the failing disk drive **Mirrored**?

   No: Continue with the next step.

   Yes: Record the status of both disk drives in the mirrored pair and continue at step 6 on page 31.

4.

Determine if the failing disk drive is parity protected:

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

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

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

Is the failing disk drive parity protected?

   Yes: Go to step 9 on page 32.

   No: Continue with the next step.

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

5.

Perform a backup of the data in the failing ASP.

Go to step 9 on page 32.

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

6.

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

> **Yes:** Go to step 9 on page 32.

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

7.

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

1. Press F3 from the Display Disk Configuration display
   to return to the Work with Disk Units display.
2. Select Work with Disk Unit Recovery from the Work
   with Disk Units display and press Enter.
3. Select Suspend mirrored protection from the Work
   with Disk Unit Recovery display and press Enter.
4. Select the option to suspend the disk drive that you
   are replacing from the Suspend Mirrored Protection
   display and press Enter.
5. Go to step 9 on page 32.

8.

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

Perform a backup of the data in the failing ASP.

Go to step 9 on page 32 to replace the failing mirrored
disk.

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

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

9.

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

1. Enter the location code of the disk drive being replaced in the form of: U787A.001.AAAXXXX-P3-D4

2. Select option 1 (Remove device) for the **Action to be performed**.

3. Set the time delay for one minute: 01.

   Important: Do not press Enter at this time.

4. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.
   Important: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive.

5. Press Enter on the console.

6. When the light blinks rapidly, perform the next step to remove the disk drive within 9 seconds.

10.

Remove the disk drive by:

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

2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
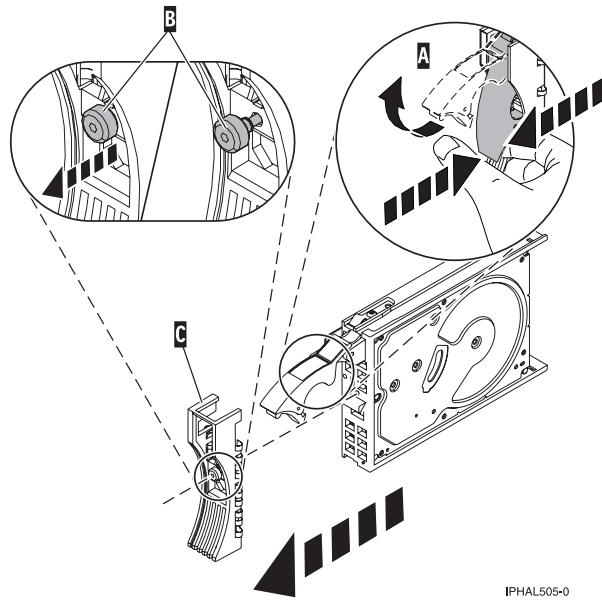
   The concurrent maintenance light for the slot turns off when you remove the disk drive.
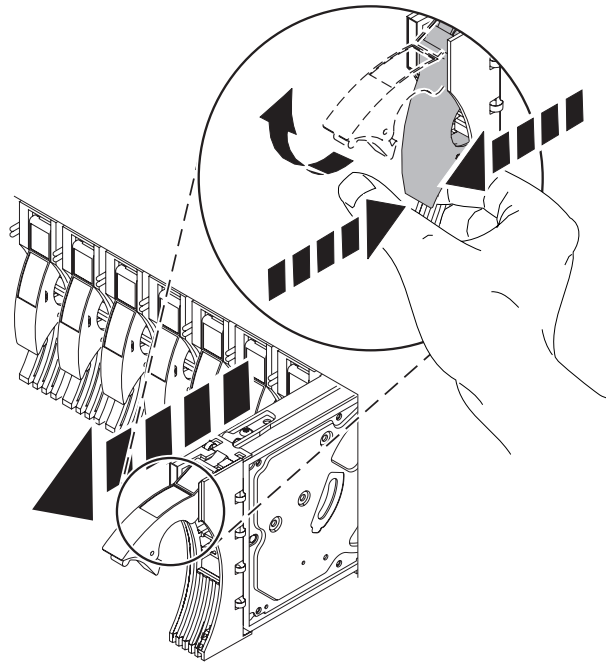
11.

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


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12.

Install the bezel on the new disk drive:

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

   Attention: Disk drives are fragile. Handle with care.

2. Remove the disk drive from its static protective package.

3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.

4. Attach the disk drive bezel **(A)** to the replacement disk drive as shown.

5. Press in and then tighten the thumbscrew **(B)** to secure the bezel to the disk drive.
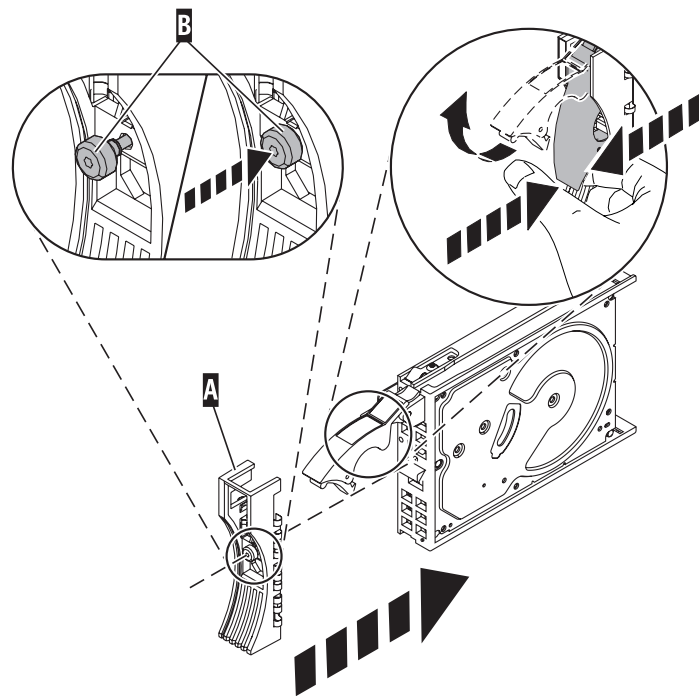
13.

1. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press F12.
2. The physical locations you entered in step 6 of this procedure might still appear on the display. If not, retype the physical location where you will be installing the new disk drive.
3. Select option **2** (Install device) for the **Action to be performed**.
4. Set the time delay for one minute: 01.

   Important: Do not press Enter at this time.
5. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing
6. **Important**: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to install the disk drive.

14.

Install the disk drive:

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

15.

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

16.

Rebuild the data on the replacement disk drive by:

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

   Note: The service tools password is case sensitive.
3. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.
4. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.

Was the failing disk drive mirrored?

No: Continue with the next step.

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17.

Was the failing disk drive parity protected?

    Yes: Go to step 20.

    No: Continue with the next step.

18.

Restore the data on the replacement disk drive from the latest backup available.
Note: Performing a restore is a customer task. Refer to the system's Operations Guide for instructions.

19.

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

20.

1. Select **Replace configured unit** on the Work with Disk unit recovery display. Press Enter.
2. Select the configured disk drive that you are exchanging (suspended drive) on the Select Configured Unit to Replace display. Press Enter.
3. Select the disk drive that you just installed on the Select Replacement Unit display. This drive has a non-configured status.

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

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

   The replacement process might take several minutes to complete.

   When the process is complete, the Work with Disk unit recovery display is shown.
5. Press F3 (Exit) to return to the Work with disk units display.
6. Select **Display disk configuration** on the Work with disk units display.
7. Select **Display disk configuration status** on the Display Disk Configuration display.

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

Was the failing disk drive mirrored?

    Yes: Go to step 22 on page 36.

    No: Continue with the next step.

21.

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

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

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

22. Go to Verifying a repair. **This completes this procedure.**

Rebuilding data on a replacement disk drive using Linux

Use this procedure to rebuild data on a replacement disk drive.

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

For an unprotected disk drive

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

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

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

Display panel

Use this procedure to service the display panel.

1.

The component will be serviced non-concurrently.

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

## 2. Remove the front bezel

1. Open the front rack door.
2. Simultaneously press in both bezel-release tabs **(A)**.
3. Pivoting the bezel from the bottom, swing the top of the bezel out.
4. Pull the bottom of the bezel up, and then away from the subsystem chassis **(B)**. This action releases the two tabs **(C)** located on the bottom of the bezel.
5. Put the bezel in a safe place.

Rear view Detail C

Rear view Detail B

A

B

C
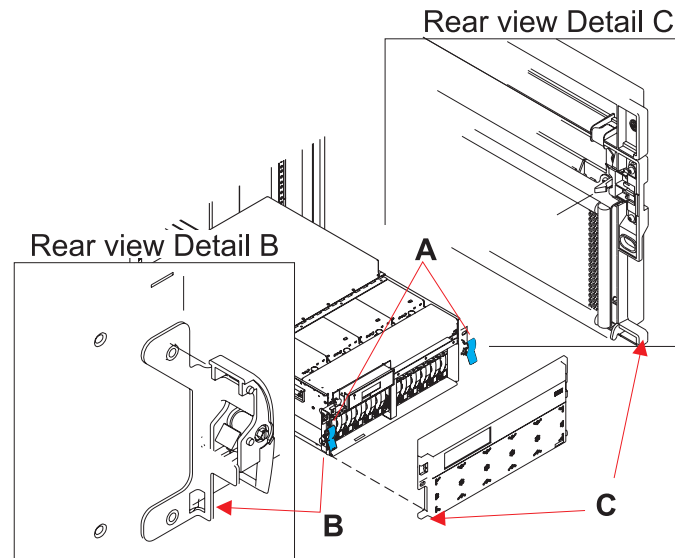
3. Remove the display panel

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

A
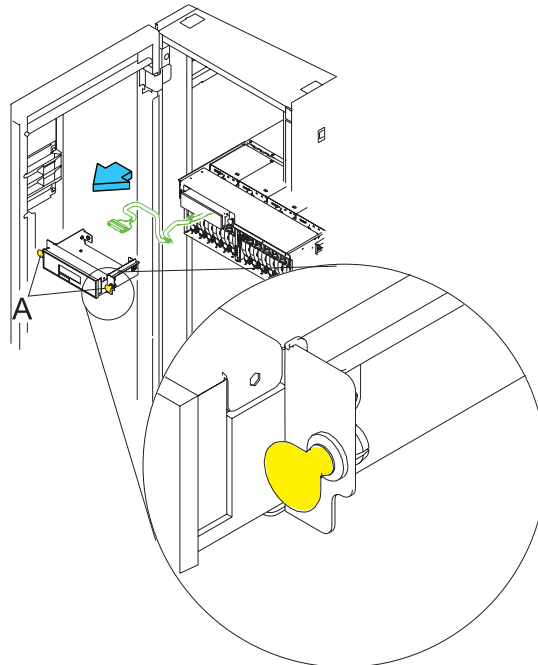
4. **Install the display panel**

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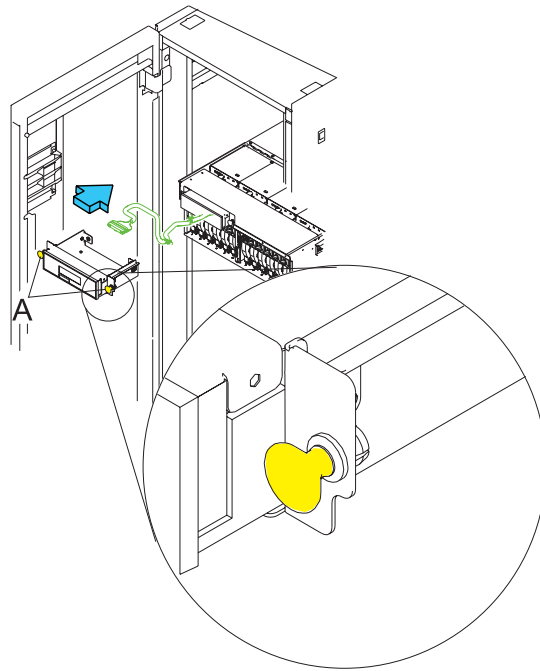
A

5. **Install the front bezel**

1. Open the front rack door.
2. Insert the two tabs **(C)** located on the bottom edge of the bezel into their locking slots **(B)**, located on the chassis.
3. Pivot the front bezel up toward the top of the chassis.
4. Align the release tabs **(A)** to the matching slots located on the front of the subsystem chassis.
5. Gently push the release tabs into the slots until the bezel seats against the front of the subsystem.
6. If the subsystem is in the service position, put the subsystem back into the operating position.
7. Reconnect the power source.
8. Close the rack door.

Rear view Detail C

Rear view Detail B

A

B

C
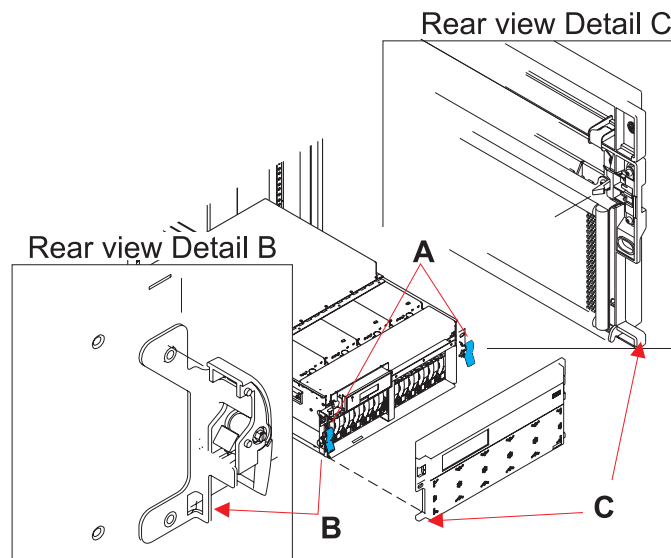
Network interface card

Use this procedure to service the network interface card (NIC).

1. **This component is serviced nonconcurrently.**

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

2. **CAUTION:**

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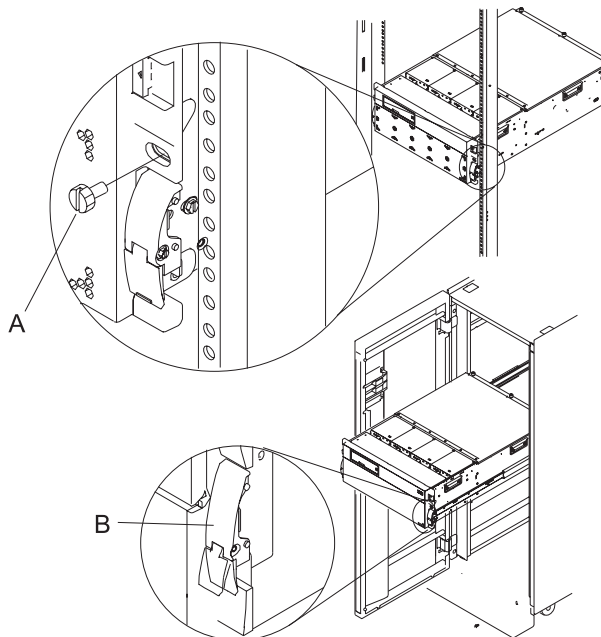
Attention: All cards are sensitive to electrostatic discharge.

3. **Place unit into service position**

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

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews **(A)** at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches **(B)**.
4. Pull the system unit out from the rack until the rails are fully extended.
5. Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped.

4. **Open the service access cover**

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews **(A)** located on the rear of the cover. Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.
3. To open the service access cover, lift the cover up from the back edge. The hinges allow the service access cover to swing open to about 170 degrees. Do not force the cover to come to a rest on top of the cooling blowers.

   Note: When you open the service access cover, ensure you have enough height clearance.

A
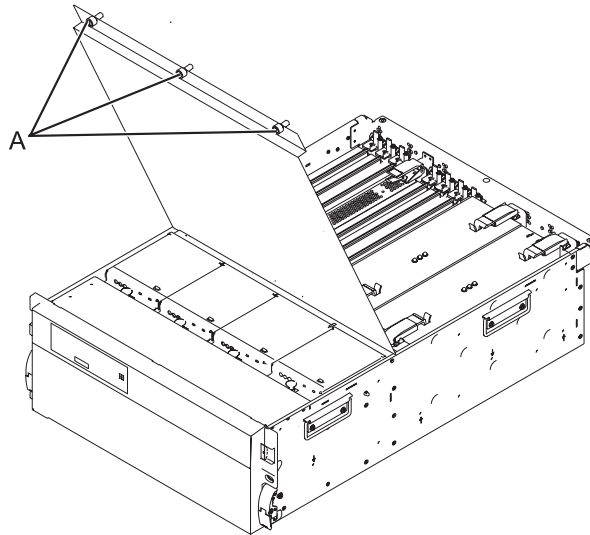
5. **Remove the HSL/RIO adapter card**

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

6. **Install the HSL/RIO adapter card**

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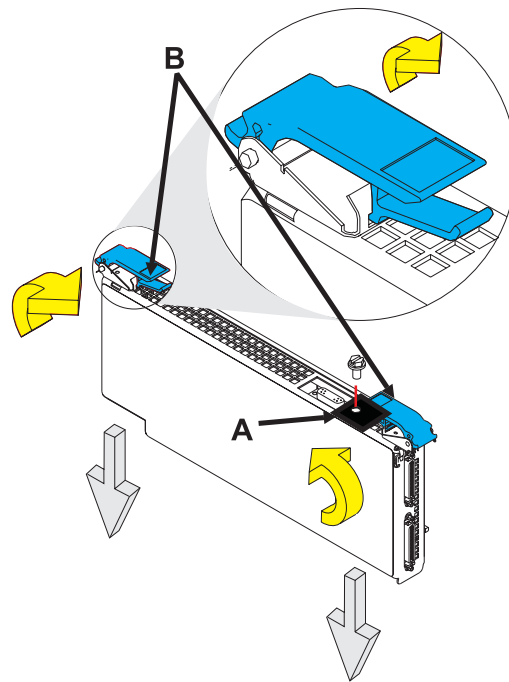
7. **Close the service access cover**

Close and then secure the service access cover with the three thumbscrews **(A)**.
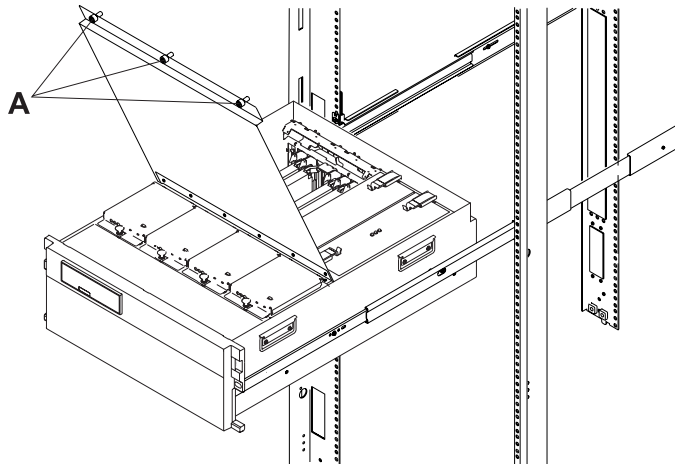
8. Reconnect the power source.

Peripheral component interconnect card

Use this procedure to service the peripheral component interconnect (PCI) card.

1. **This component is serviced nonconcurrently.**

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

2. **The component will be serviced concurrently.**

Do not remove power to the unit during this repair procedure.

3. **CAUTION:**

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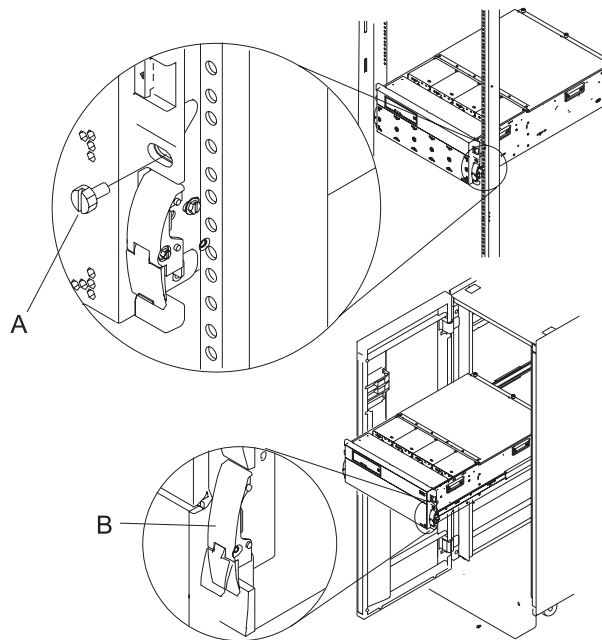
Attention: All cards are sensitive to electrostatic discharge.

4. **Place unit into service position**

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

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews **(A)** at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches **(B)**.
4. Pull the system unit out from the rack until the rails are fully extended.
5. Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped.

5. **Open the service access cover**

1. Open the front rack door and place the system into the service position.

2. Loosen the three captive thumbscrews **(A)** located on the rear of the cover. Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.

3. To open the service access cover, lift the cover up from the back edge. The hinges allow the service access cover to swing open to about 170 degrees. Do not force the cover to come to a rest on top of the cooling blowers.

   Note: When you open the service access cover, ensure you have enough height clearance.

A
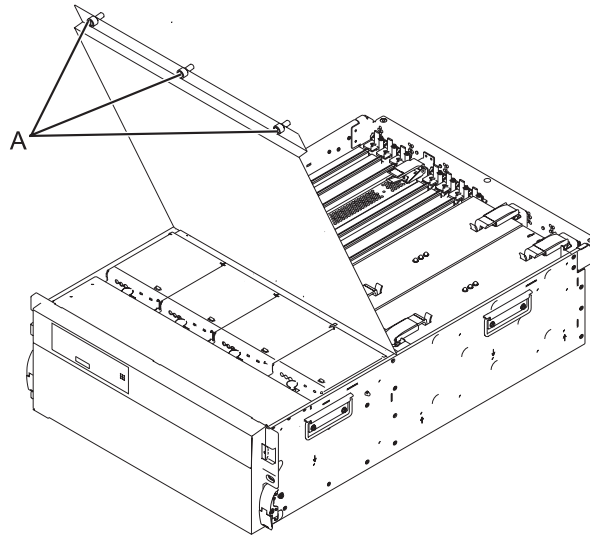
6. **Remove the PCI card**

1. Look at the power LED for the card that you are removing to ensure that it is powered off. The power LED is located to the left of and directly above the card slot. If the LED is flashing or it is off, then the card is powered off.

2. Disconnect and label any cables from the card that you wish to remove.

3. Turn the orange latch **(A)** counter-clockwise and lift up on the black latch **(B)** to release the card.

4. Gently pull the card straight out of the card cage assembly.

7. Install the PCI card

1. Push the card straight into its slot in the PCI card cage assembly.

2. Push down on the black latch **(B)**, then turn the orange latch **(A)** clockwise to secure the card.

3. Connect any cables to the card that you previously removed.
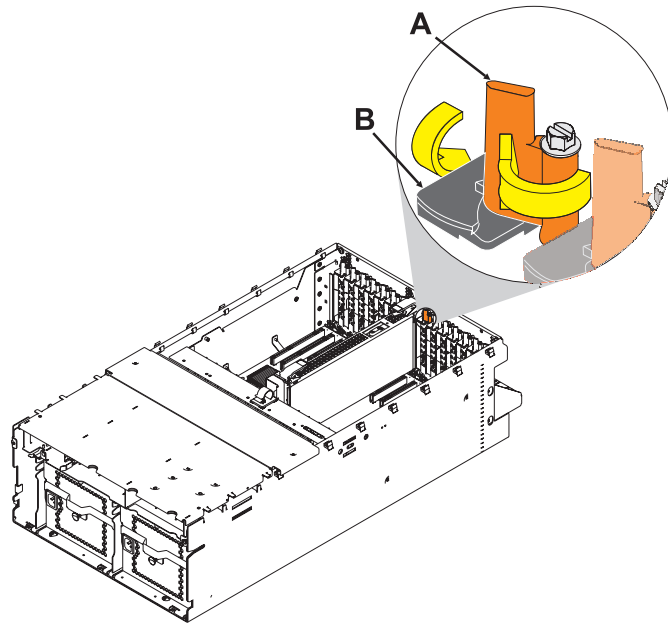
8. Close the service access cover

Close and then secure the service access cover with the three thumbscrews **(A)**.
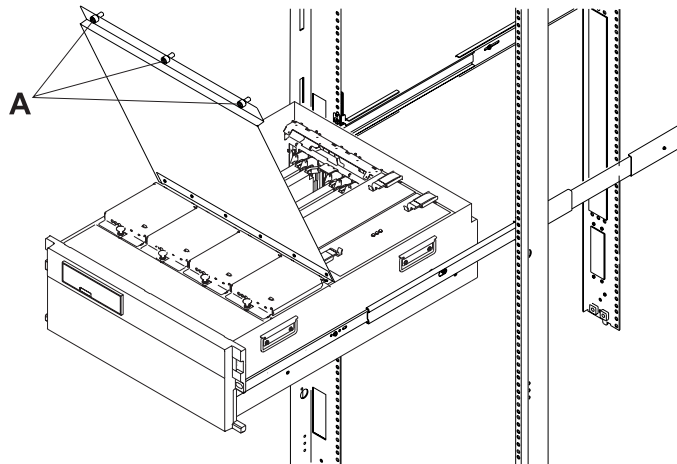
9. **Place unit into operating position**

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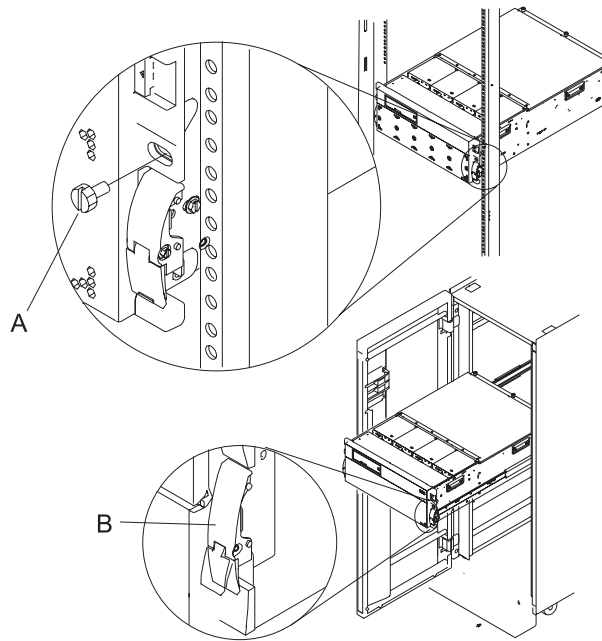4. Close the front rack door.
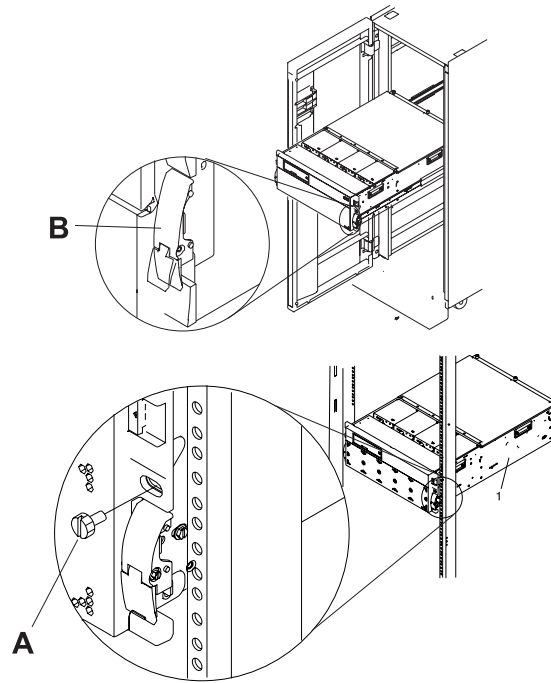
Power supply

Use this procedure to service the power supply.

1. **Place unit into service position**

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

1. Open the front rack door.

2. If your system is equipped
   with two blue thumbscrews
   securing it to the rack, remove
   the thumbscrews **(A)** at this
   time. The screws are located on
   the right and left side of the
   bezel, just above each
   subsystem release latch.

3. Release the subsystem release
   latches **(B)**.

4. Pull the system unit out from
   the rack until the rails are fully
   extended.

5. Note: When the system rails
   are fully extended, safety
   latches on the slide rails lock
   into place. This action prevents
   the system from being
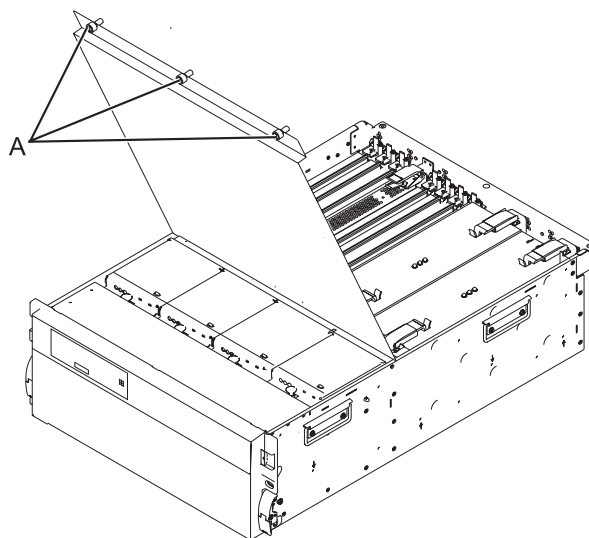   accidentally pulled out too far
   and dropped.

---

2. **Open the service access cover**

1. Open the front rack door
   and place the system into
   the service position.

2. Loosen the three captive
   thumbscrews **(A)** located on
   the rear of the cover. Note:
   The service access cover
   pivots on a piano hinge
   located directly behind the
   four cooling blowers.

3. To open the service access
   cover, lift the cover up from
   the back edge. The hinges
   allow the service access
   cover to swing open to
   about 170 degrees. Do not
   force the cover to come to a
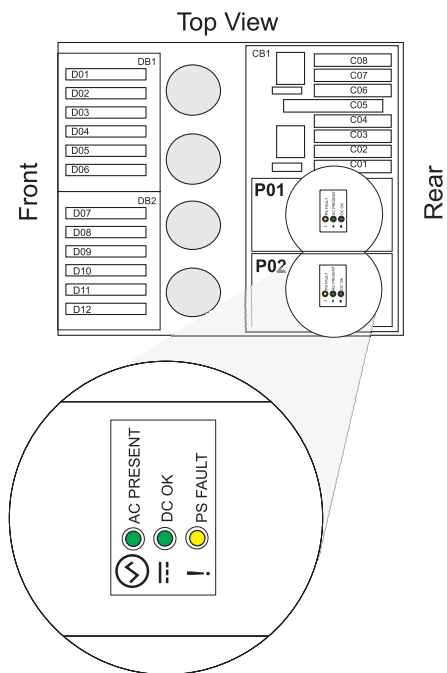   rest on top of the cooling
   blowers.

   Note: When you open the
   service access cover, ensure
   you have enough height
   clearance.

---

3. **You must determine if the repair can continue concurrently.**

To continue the repair concurrently, the following conditions must be true:

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

Top View

Front

Rear

CB1

DB1
D01
D02
D03
D04
D05
D06

DB2
D07
D08
D09
D10
D11
D12

C08
C07
C06
C05
C04
C03
C02
C01

P01

P02

AC PRESENT

DC OK

PS FAULT

4. **Continue the repair concurrently or nonconcurrently.**

Select an action:

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

5. **The component will be serviced concurrently.**

Do not remove power to the unit during this repair procedure.

6. **The component will be serviced nonconcurrently.**

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

7. **Remove the power supply**

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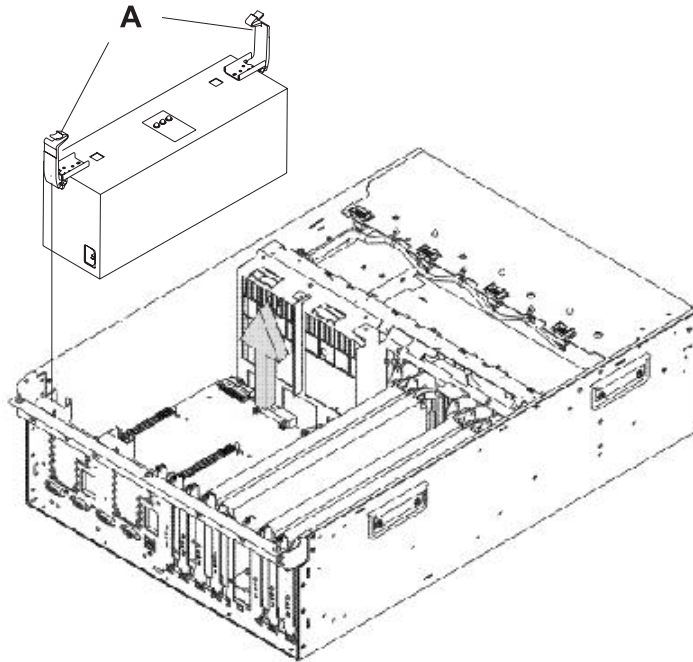
8. **Install the power supply**

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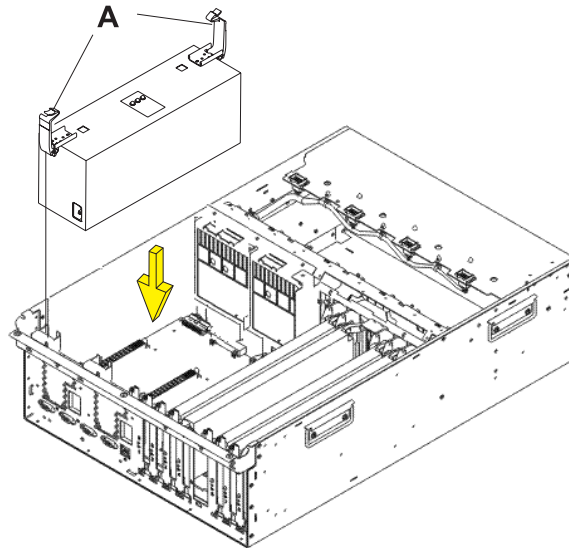
9. **You must determine if the new power supply is operational.**

The new power supply is operational if its LEDs are set as follows:

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

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

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

Top View

Front

Rear
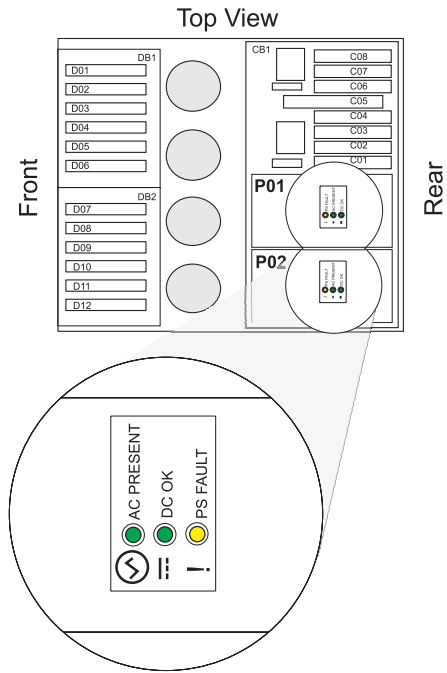
10. **Close the service access cover**

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

A
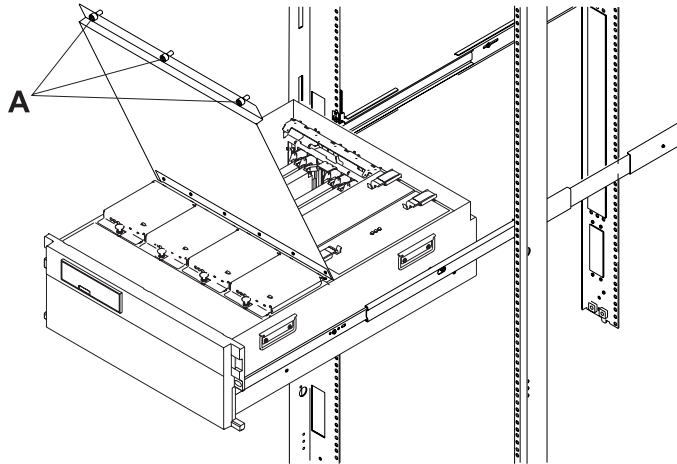
Selectable PCI card

1. This field replaceable unit (FRU) class extends the ISXorNormalPCICard class. It is not a "typical" FRU class.
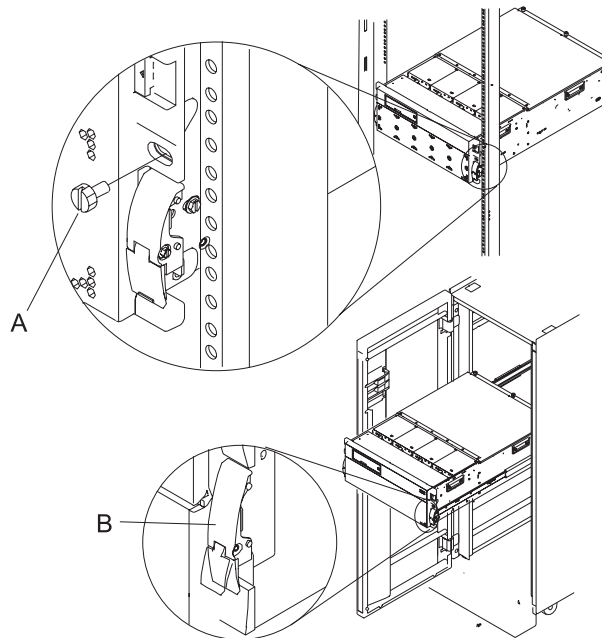
I/O backplane

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

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

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

3. Power off the expansion unit.

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

5. **Place unit into service position**

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

1. Open the front rack door.

2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews **(A)** at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.

3. Release the subsystem release latches **(B)**.

4. Pull the system unit out from the rack until the rails are fully extended.

5. Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped.

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

7. **Open the service access cover**

1. Open the front rack door and place the system into the service position.

2. Loosen the three captive thumbscrews **(A)** located on the rear of the cover. Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.

3. To open the service access cover, lift the cover up from the back edge. The hinges allow the service access cover to swing open to about 170 degrees. Do not force the cover to come to a rest on top of the cooling blowers.
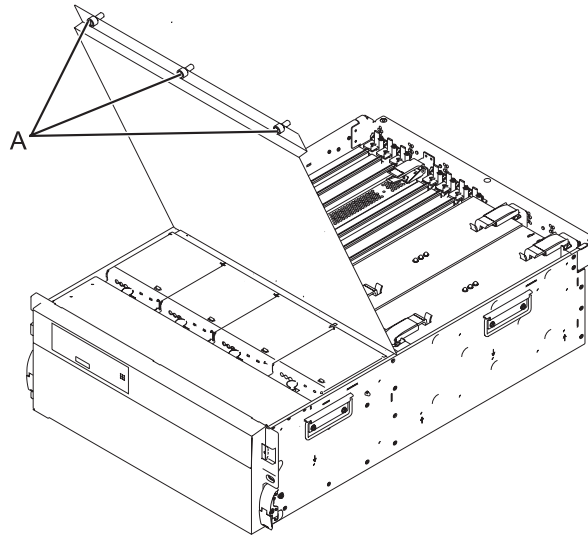
   Note: When you open the service access cover, ensure you have enough height clearance.

8. Remove the following:
   - PCI cards (see "Peripheral component interconnect card" on page 41)
   - RIO/HSL I/O bridge adapter
   - Card dividers

9. Remove the power supplies (see "Power supply" on page 45).

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

11. Install the new backplane by reversing the procedure described in step 5 on page 50 to step 10.

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

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

13. Set the I/O enclosure configuration ID and MTMS value, and then continue with the next step of this procedure.

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

14. If this is a 7311-D20 expansion unit connected to a System p server with an activated firmware level that is lower than SF235, go to step 15. Otherwise, go to step 17 on page 52.

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

16. An SPCN microcode download to the expansion unit may or may not be occurring.
    - If an SPCN microcode download does not occur, go to step 17 on page 52.

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

    This ends the procedure.

Appendix. Notices

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Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A respecte est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:
IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Tele: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Statement - Japan

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Electromagnetic Interference (EMI) Statement - People's Republic of China

声　　明

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该产品可能会造成无线电干扰。
在这种情况下,可能需要用户对其
干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

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居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

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Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

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

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

ВНИМАНИЕ! Настоящее изделие относится к классу А. В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

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