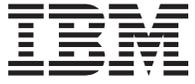




System i and System p  
Power supply







System i and System p  
Power supply

**Note**

Before using this information and the product it supports, read the information in “Notices” on page 131 and the *IBM Systems Safety Information* manual, G229-9054.

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## Safety and environmental notices

Safety notices may be printed throughout this guide:

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

### World Trade safety information

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

### Laser safety information

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

#### Laser compliance

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

#### CAUTION:

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

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

(C026)

#### CAUTION:

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

#### CAUTION:

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

#### CAUTION:

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

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

### Product recycling and disposal

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

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



EU Only

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

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

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

## Battery return program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

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

For Taiwan: Please recycle batteries.



For the European Union:



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

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

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

For California: Perchlorate Material - special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate).

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

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

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

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

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## About this topic

The following procedures describe the removal, replacement, and installation of system unit power supplies.

For information about the accessibility features of this product, for users who have a physical disability, see “Accessibility features,” on page 129.



---

## Power supply

Learn how to remove, replace, and install power supplies.

Replacing this feature is a customer task. You can either perform this task 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.

---

### PDF file for power supply

You can view and print a PDF file of this information.

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3. Navigate to the directory in which you want to save the PDF.
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## Model 7047-185 or 7037-A50 power supply

Learn how to install, or remove and replace a power supply.

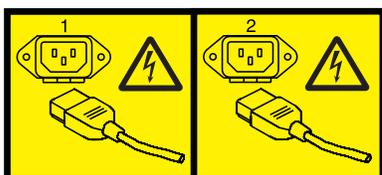
### Remove the model 7047-185 or 7037-A50 power supply

Learn how to remove a power supply to replace a failed unit or as a part of another service action. Use the procedure in this section to accomplish this task.

To remove a power supply complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If the system is running, “Stop the system or logical partition” on page 89.
3. Remove the side cover. “Remove and replace model 7047-185 or 7037-A50 covers and doors” on page 90.
4. Disconnect the power cable from the back of the power supply.

(L003)



or



5. Wait at least 10 seconds before performing the next step.

**Attention:**

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

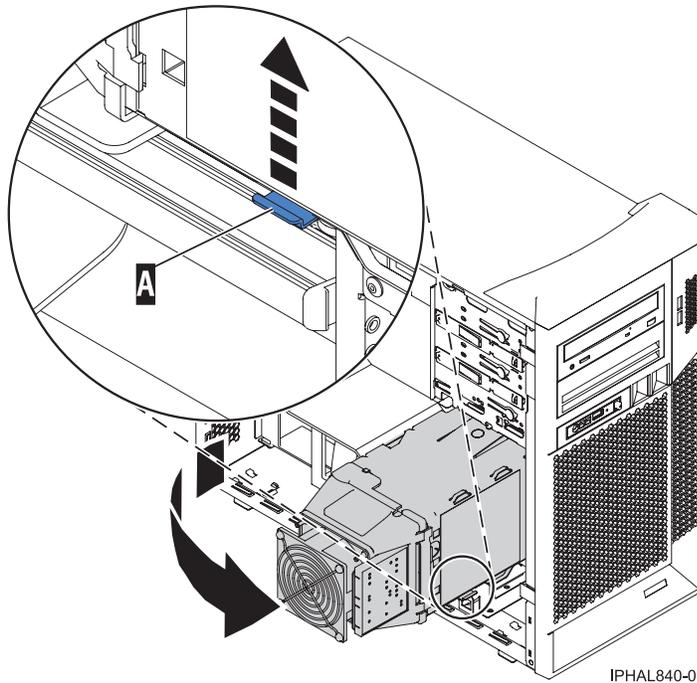


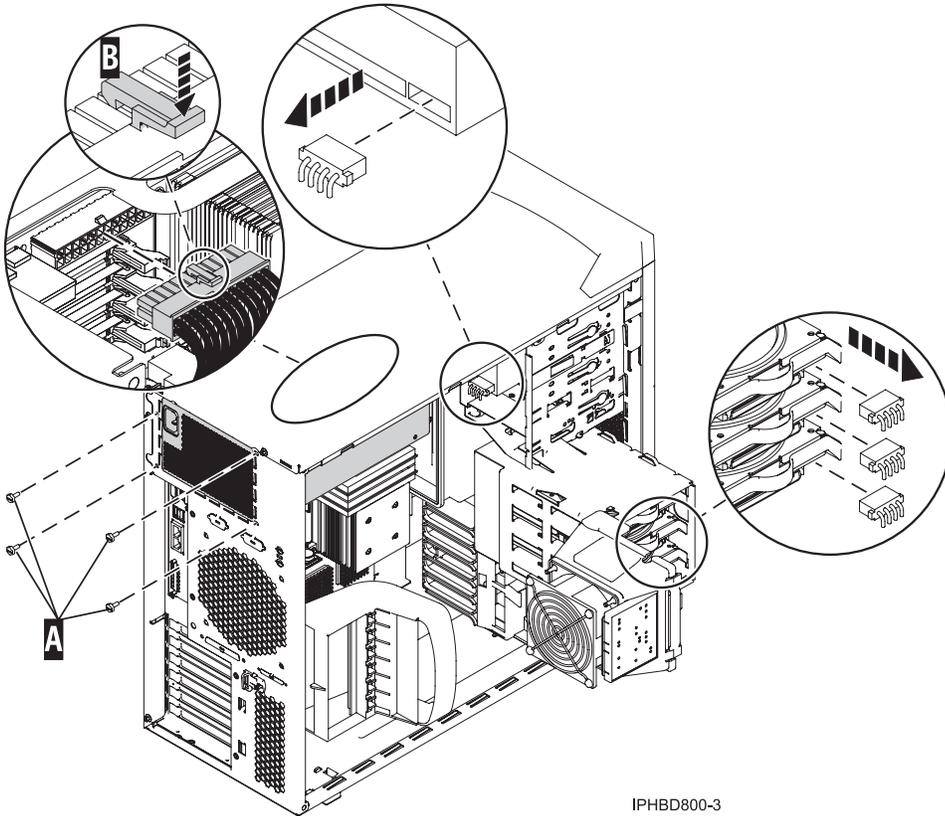
Figure 1. lifting the disk drive cage

7. Open the air baffle door by lifting up on the tab in the center of the air baffle and pulling the door off of the air baffle.
8. Label and remove all power connectors from the system power supply.

**Note:** The release tab **B** on the main power connection to the system backplane is very close to the air baffle and might be difficult to reach. If you cannot reach the release tab with the baffle down, slightly lift the air baffle to press the release tab .

9. Remove the four thumbscrews **A** from the back of the system unit as shown in the following figure.

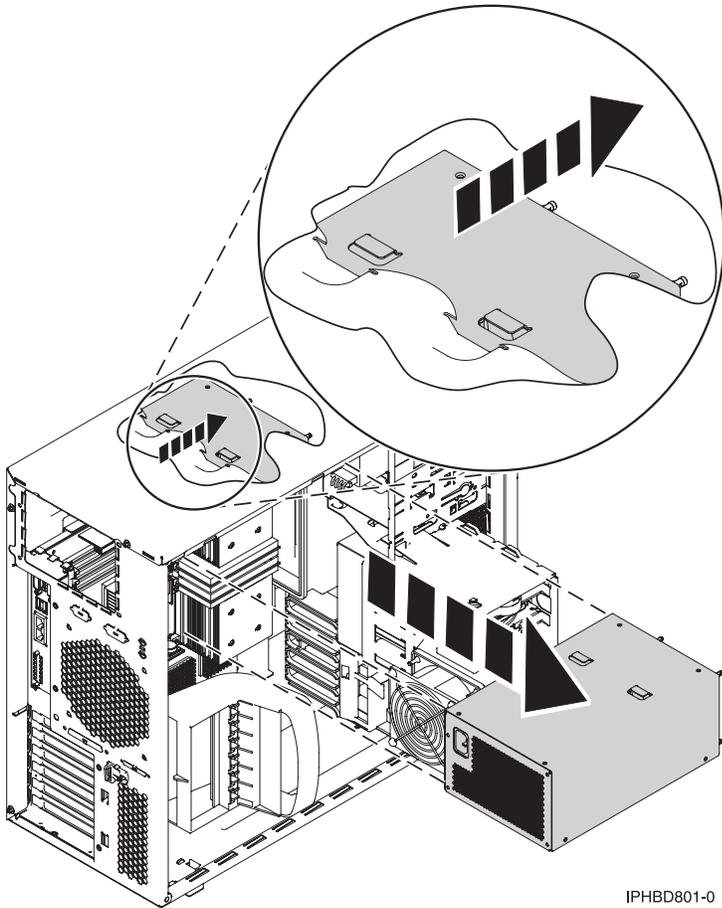
**Note:** The following figure shows the basic configuration. Take care to label all power cords and record their connection locations.



IPHBD800-3

Figure 2. Removing the power supply connections

10. Slide the power supply forward, releasing it from the bracket on the top of the system unit as shown in the following figure.
11. Remove the power supply from the system unit.



IPHBD801-0

Figure 3. Detaching the power supply

To replace the power supply see, “Replace the model 7047-185 or 7037-A50 system unit power supply”

## Replace the model 7047-185 or 7037-A50 system unit power supply

Learn how to replace a power supply after removing a failed unit or as a part of another service action. Use the procedure in this section to accomplish this task.

**Note:** Do not attach the power cord to the power supply until instructed to do so.

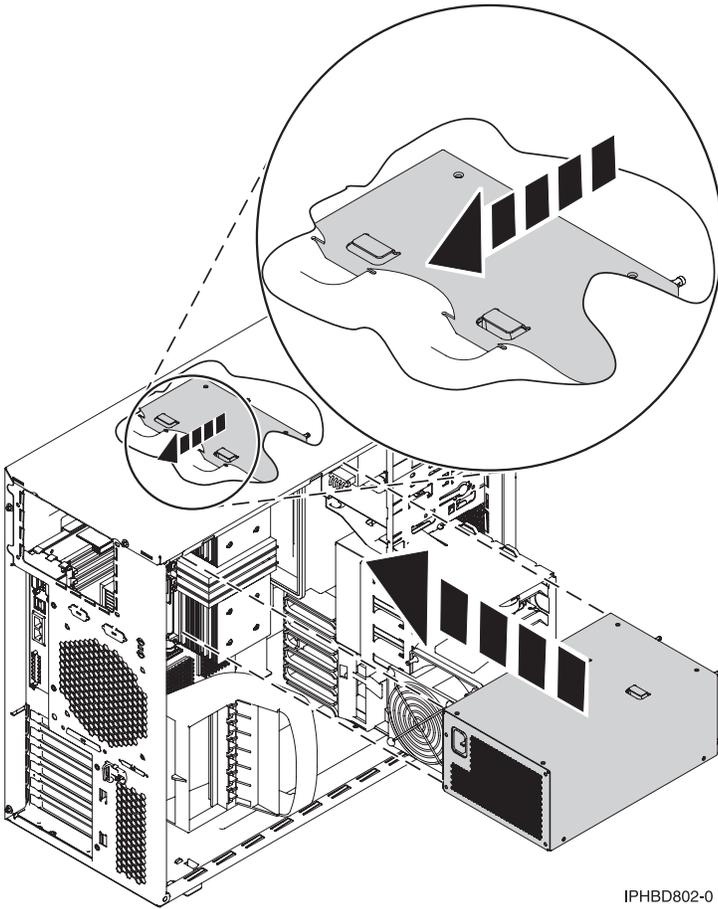
To replace a power supply complete the following steps:

1. If you have not previously removed the power supply, do so now. See “Remove the model 7047-185 or 7037-A50 power supply” on page 1.

**Attention:**

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Perform the prerequisite tasks described in “Before you begin” on page 85.

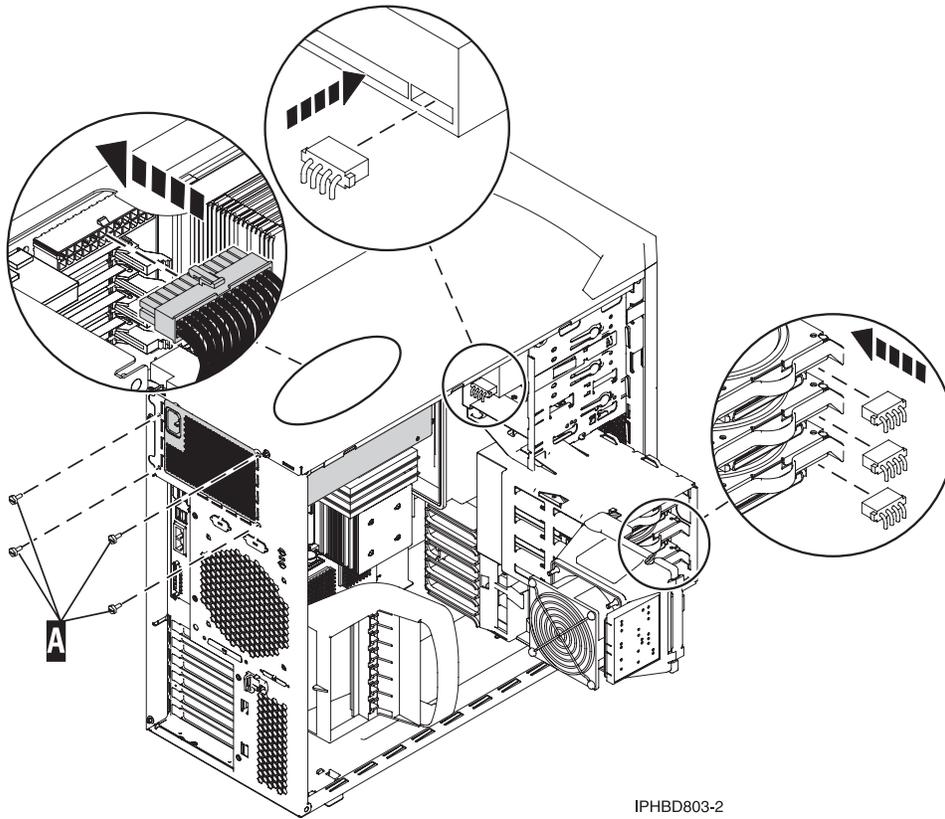
- Slide the power supply into the bracket on the top of the system unit as shown in the following figure.



IPHBD802-0

Figure 4. Attaching the power supply

- Attach the four thumbscrews **A** through the back of the system unit to the power supply as shown in the following figure.



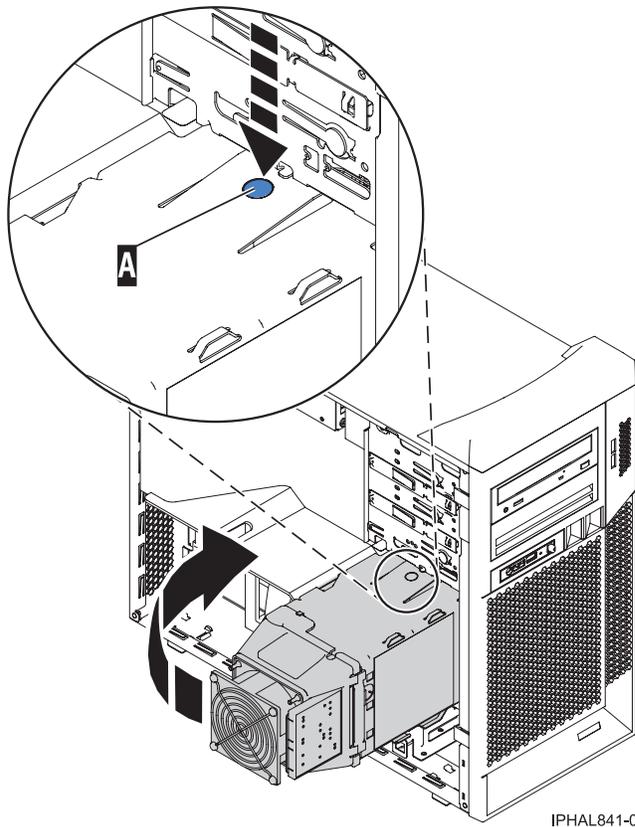
IPHBD803-2

- Attach the power connectors to the system in the locations you noted in the remove process.

**Note:** The previous figure shows a basic configuration; your system might be different.

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

Figure 5. lowering the disk drive cage



IPHAL841-0

7. Reconnect the power cable at the back of the power supply.
8. Replace the side cover. For instructions, see “Remove and replace model 7047-185 or 7037-A50 covers and doors” on page 90.
9. Reconnect the cables at the back of the system.
10. On a rack-mounted system unit, close the back rack door.
11. If the system was stopped, “Start the system or logical partition” on page 87.

---

## Model 505 power supply

Learn how to install, or remove and replace a power supply.

The following procedures describe the installation, removal, and replacement of a power supply. This server can have up to two power supplies.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Install or replace a model 505 power supply with the power on

Learn to install a second power supply, or replace one of two power supplies present in the system.

The following procedure describes how to install a power supply or replace a power supply when two power supplies are present. The system power can remain on under the following conditions:

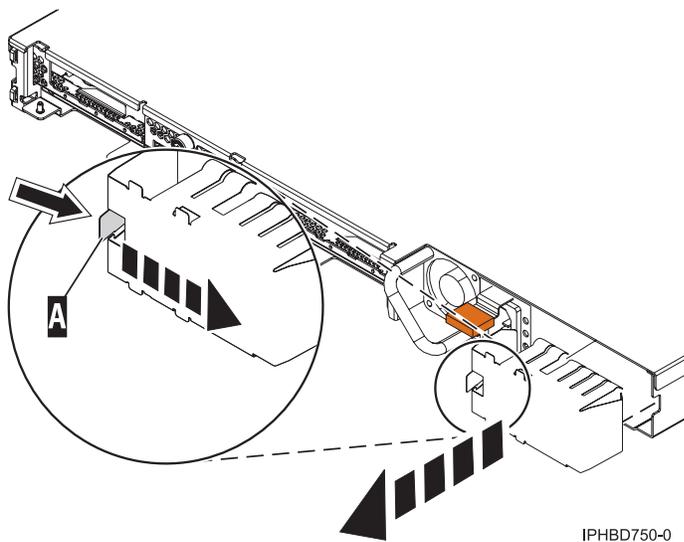
- When installing a second power supply.
- When one of the two power supplies present in the system must be replaced.

To install a second power supply or to replace a failing power supply when two are present in the system, do the following procedure:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.
3. If a failing power supply is present, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
4. Disconnect the power cable from the failing power supply at the back of the system.

**Attention:**

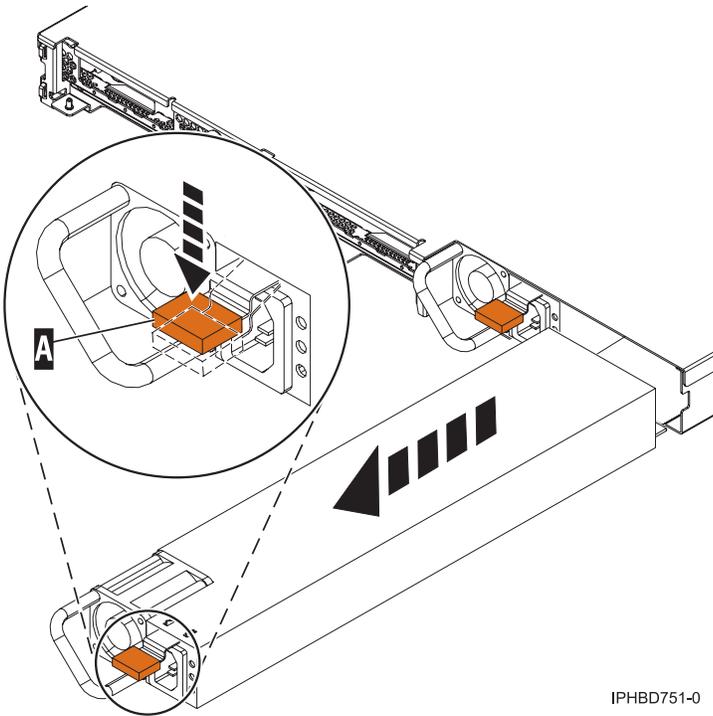
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric 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. Ensure that the power supply bay is empty by doing one of the following steps:
    - Remove the power supply filler by pushing the tab **A** to the right and pulling the filler out of the system.



IPHBD750-0

Figure 6. Remove a power supply filler

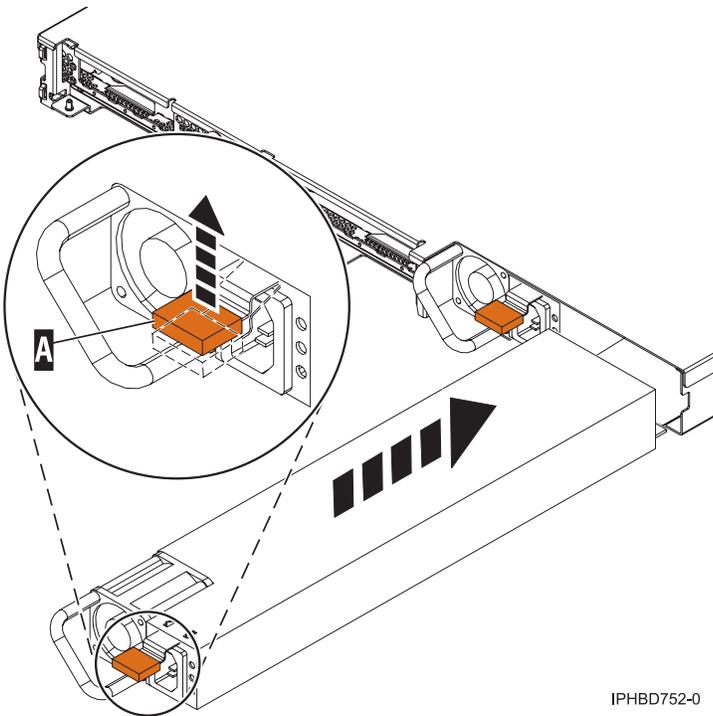
- Remove a failing power supply by doing the following:
  - a. Press the terra-cotta tab **A** while grasping the handle.
  - b. After the power supply is released, use the handle to pull the power supply out.



IPHBD751-0

Figure 7. Remove a power supply

6. As shown in Figure 8, insert the new power supply into the power supply bay.



IPHBD752-0

Figure 8. Install a power supply

7. Slowly press the power supply into the system. The power supply tab A will snap into place, which indicates that the power supply is seated correctly and locked into position.

8. If you are installing a second power supply feature, plug the second power cable into the back of the new power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the handle.
9. Connect the power source to the system.
10. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read “Power supply LEDs” on page 74. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 7. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
11. If you are working on a rack-mounted system unit, ensure the system cables are routed correctly through the cable-management arm.
12. Reconnect the cables at the back of the system.
13. On a rack-mounted system unit, close the back rack door.

## Remove and replace the model 505 power supply with power off

View these instructions for installing a feature that requires removal of the power supplies, or replacing the primary or the only power supply present in the system.

The following procedures describe the removal and replacement of the power supply while the power is off. This system can have up to two power supplies. A power supply is removed and replaced while the system power is off under the following conditions:

- The primary power supply has failed and a secondary power supply is not present in the system.
- The power supply must be removed from the system to repair another part of the system.

### Remove the model 505 power supply

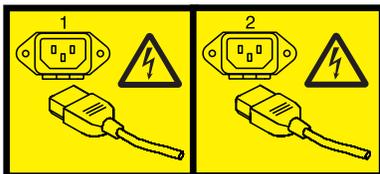
Learn how to remove a power supply with the system power off.

To remove a power supply complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If you are removing the power supply as part of another procedure, continue to the next step. If you are removing the power supply because it is not operational, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, “Stop the system or logical partition” on page 89.
4. On a rack-mounted system unit, open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**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



6. Wait at least 10 seconds before performing the next step.

**Attention:**

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
7. As shown in Figure 9 on page 13, depress the terra-cotta tab **A** while grasping the handle.

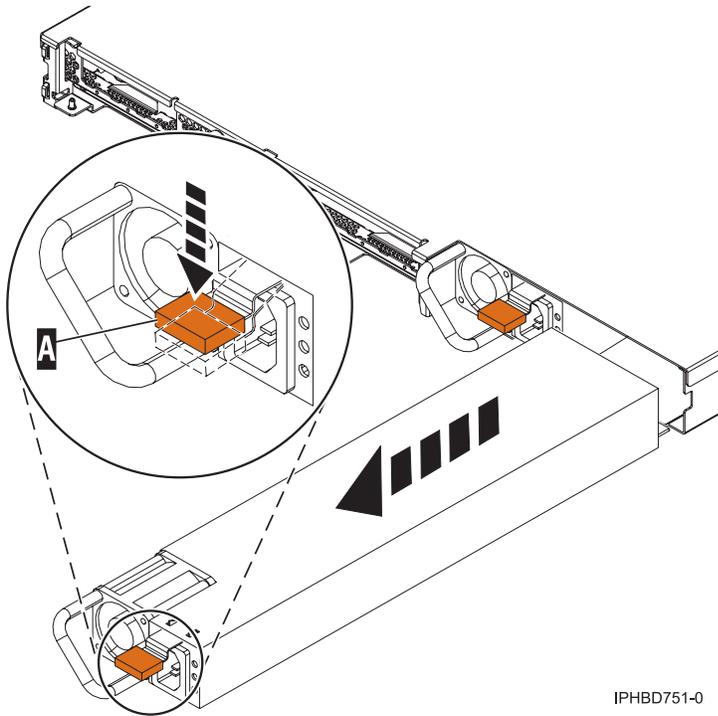


Figure 9. Remove a power supply

8. After the power supply is released, use the power supply handle to pull the power supply out of the system.

### Replace the model 505 power supply

Learn how to replace a power supply with the system power off. Use the procedure in this section to accomplish this task.

#### Notes:

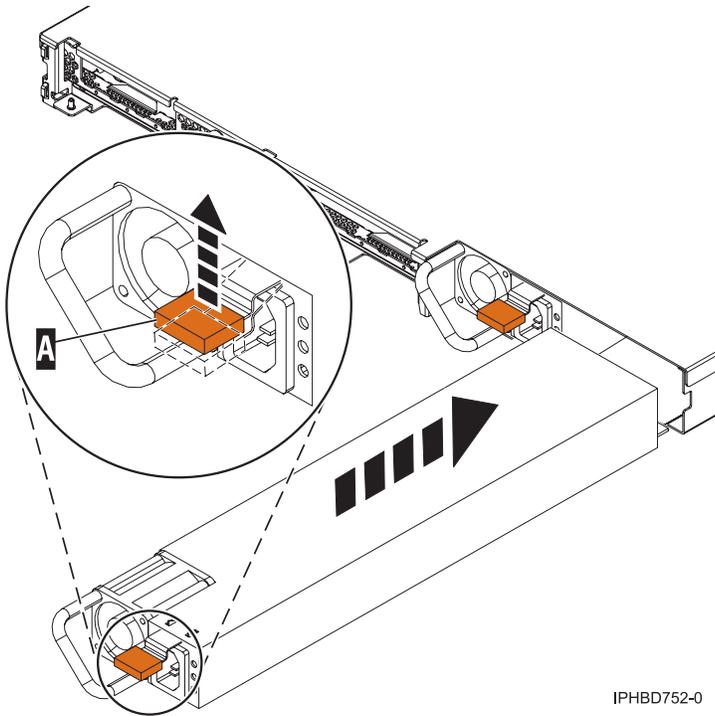
1. Do not connect the power cables to the power source until you are instructed to do so.
2. During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

To replace a power supply complete the following steps:

1. If you have not previously removed the power supply, do so now. For instructions, see “Remove the model 505 power supply” on page 11.

#### Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. As shown in Figure 10 on page 14, grasp the power supply handle **A** and carefully insert the new power supply into the power supply bay.



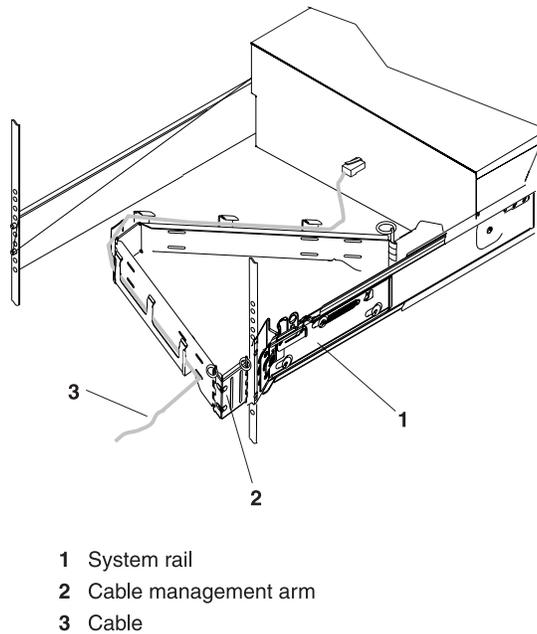
IPHBD752-0

Figure 10. Install a power supply

3. Slowly press the power supply into the system. The power supply tab will snap into place, which indicates that the power supply is seated correctly and locked into position.
4. Reconnect the power cable at the back of the power supply through the handle, if provided.
5. Note the state of the light-emitting diodes (LEDs) on the power supply. For information about the states of the power supply LEDs, read "Power supply LEDs" on page 74.

If the LEDs indicate that the power supply is operating correctly, continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

6. If you are working on a rack-mounted system unit, ensure the system cables are routed correctly through the cable-management arm.



IPHAH615-0

Figure 11. Cables routed through the cable-management arm

7. Reconnect the cables at the back of the system.
8. On a rack-mounted system unit, close the back rack door.
9. If the system was stopped, “Start the system or logical partition” on page 87.

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## Model 51x or 710 power supply

Learn how to install, or remove and replace a power supply.

The following procedures describe the installation, removal, and replacement of a power supply. This server can have up to two power supplies.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Install or replace a model 51x or 710 power supply with the power on

Learn how to install a second power supply, or replace one of two power supplies present in the system. Use the procedure in this section to accomplish this task.

The following procedure describes how to install a power supply or replace a model 51x or OpenPower® 710 power supply when two power supplies are present in the system. The system power can remain on under the following conditions:

- You are installing a second power supply.
- One of the two power supplies present in the system must be replaced.

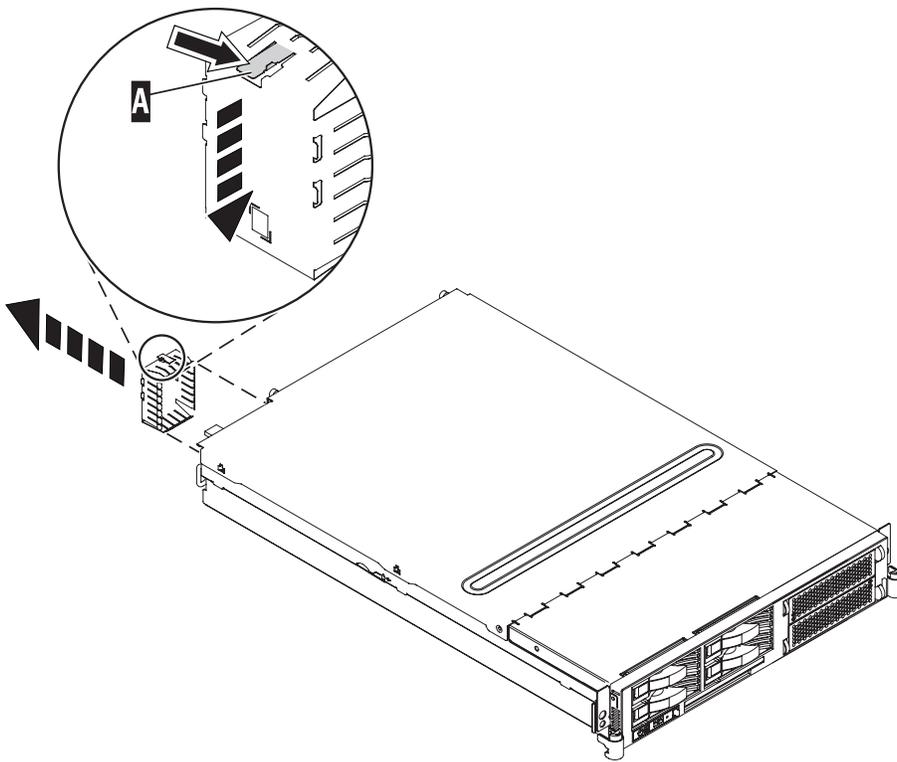
To install a second power supply or to replace a failing power supply when two are present in the system, do the following:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.

3. If a failing power supply is present, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
4. Disconnect the power cable from the failing power supply at the back of the system.

**Attention:**

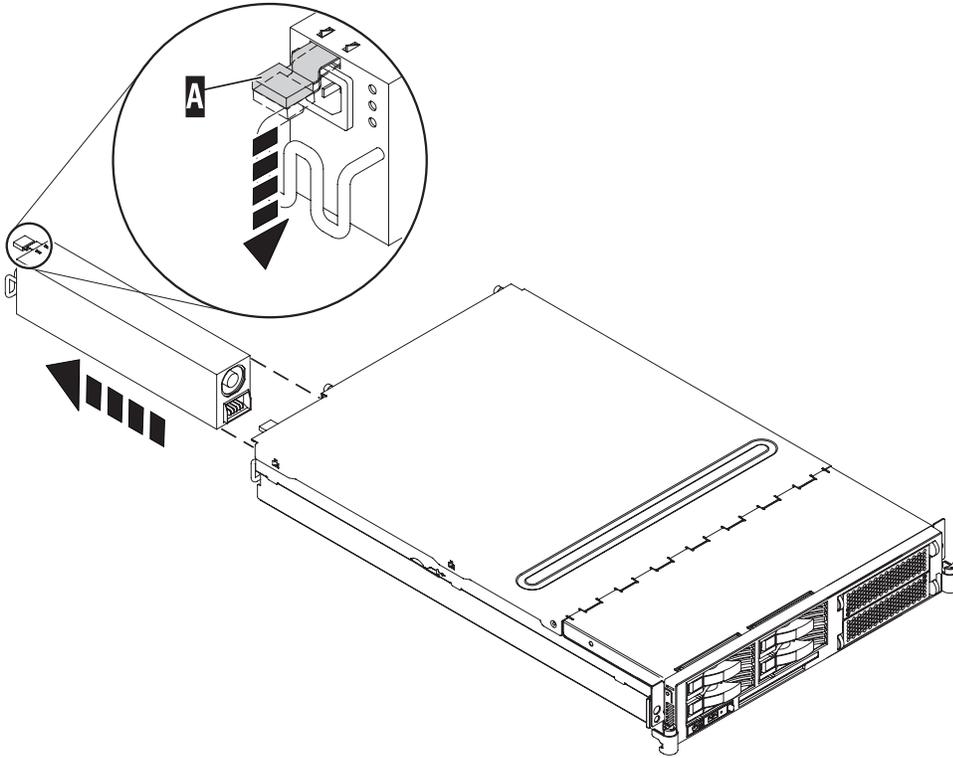
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric 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. Ensure that the power supply bay is empty by doing the following:
    - a. Remove the power supply filler by pushing the tab down **A** and pulling the filler out of the system.



IPHBD950-0

Figure 12. Remove a power supply filler

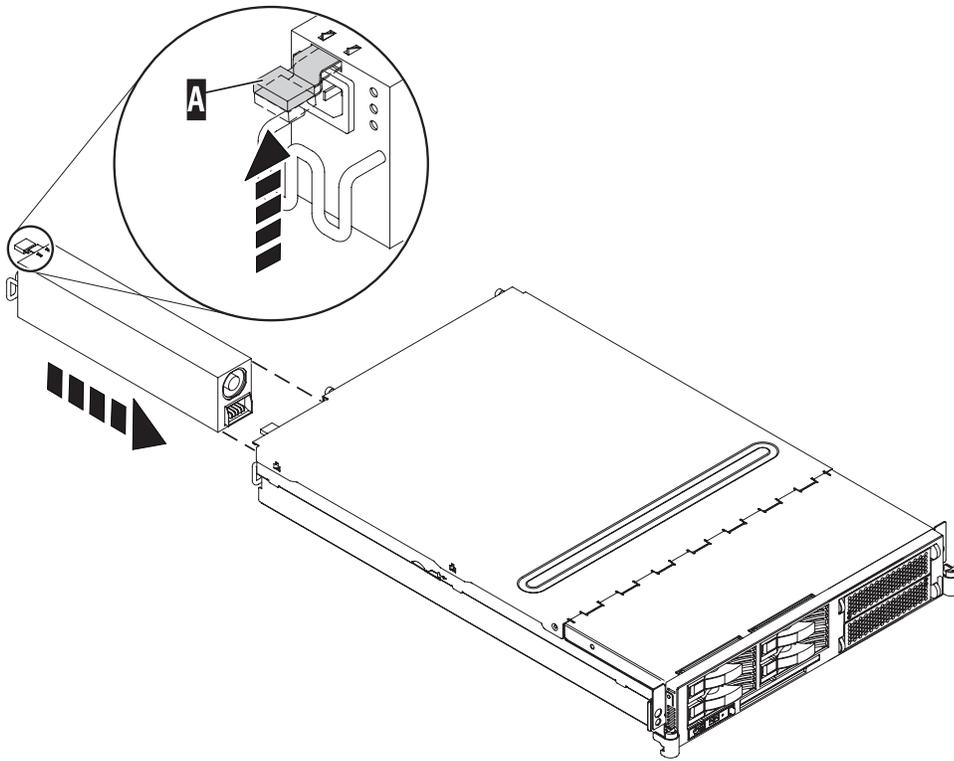
- b. Remove a failing power supply by doing the following steps:
  - 1) Press the terra-cotta tab **A** while grasping the handle.
  - 2) After the power supply is released, use the handle to pull the power supply out.



IPHBD951-0

Figure 13. Remove a power supply

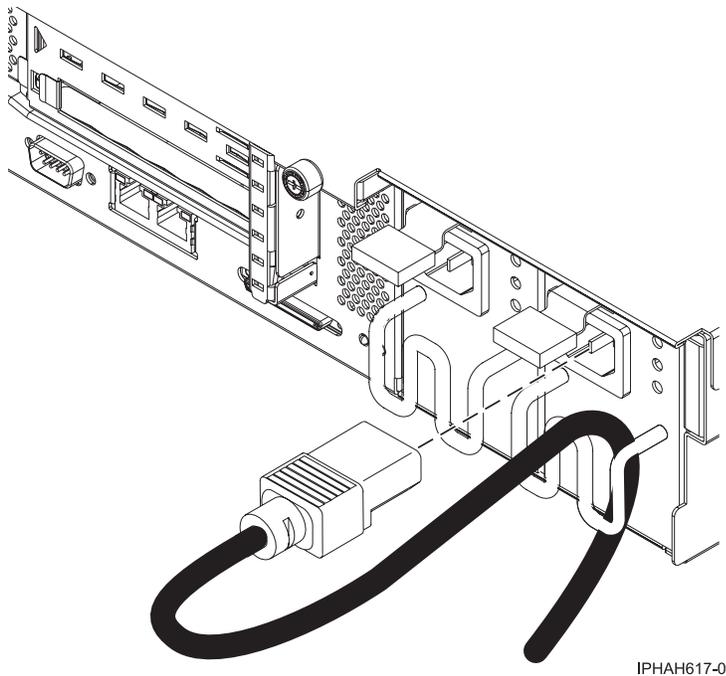
6. As shown in Figure 14 on page 18 insert the new power supply into the power supply bay.



IPHBD952-0

*Figure 14. Install a power supply*

7. Slowly press the power supply into the system. The power supply tab will snap into place, which indicates that the power supply is seated correctly and locked into position.
8. If you are installing a second power supply feature, plug the second power cable into the back of the new power supply.
9. Connect the power source to the system. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring or bar, if provided, before you plug it into the back of the server. For an example, see Figure 15 on page 19.



IPHAH617-0

Figure 15. Route the power cable through the bar

10. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read “Power supply LEDs” on page 74. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 7. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
11. If you are working on a rack-mounted system unit, ensure the system cables are routed correctly through the cable-management arm.
12. Reconnect the cables at the back of the system.
13. On a rack-mounted system unit, close the back rack door.

## Remove and replace the model 51x or 710 power supply with power off

Learn how to install a feature that requires removal of the power supplies, or how to replace the primary or only power supply present in the system.

The following procedures describe the removal and replacement of a power supply while the power is off. This system can have up to two power supplies. A power supply is removed and replaced while the system power is off under the following conditions:

- The primary power supply has failed and a secondary power supply is not present in the system.
- The power supply must be removed from the system to repair another part of the system.

### Remove the model 51x or 710 power supply

Learn how to remove a power supply with the system power off to replace a failing power supply or to perform another service action. Use the procedure in this section to accomplish this task.

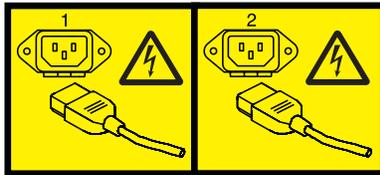
To remove a power supply while the system power is off, complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If you are removing the power supply as part of another procedure, continue to the next step. If you are removing the power supply because it is not operational, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, “Stop the system or logical partition” on page 89.

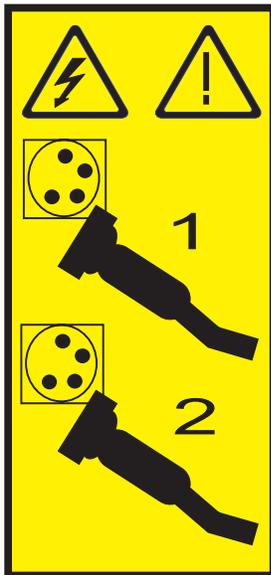
4. On a rack-mounted system unit, open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**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

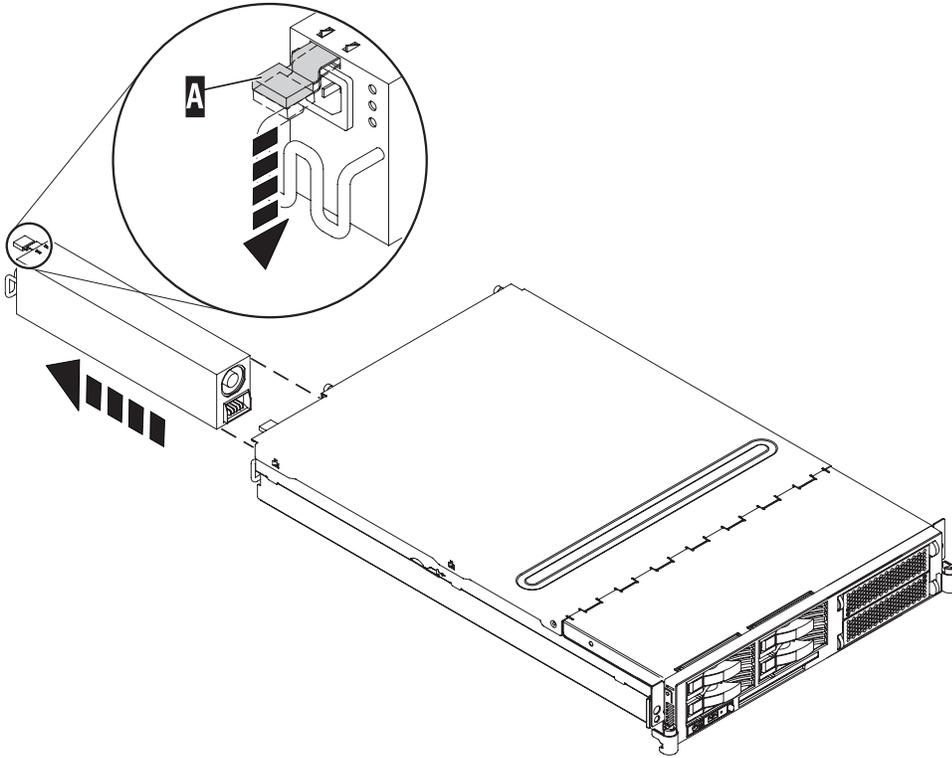


6. Wait at least 10 seconds before performing the next step.

**Attention:**

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

7. As shown in Figure 16 on page 21, press the terra-cotta tab **A** while grasping the handle.



IPHBD951-0

Figure 16. Remove a power supply

8. After the power supply is released, use the power supply handle to pull the power supply out of the system.

### Replace the model 51x or 710 power supply

Learn how to replace a power supply with the system power off.

#### Notes:

1. Do not connect the power cables to the power source until you are instructed to do so.
2. During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

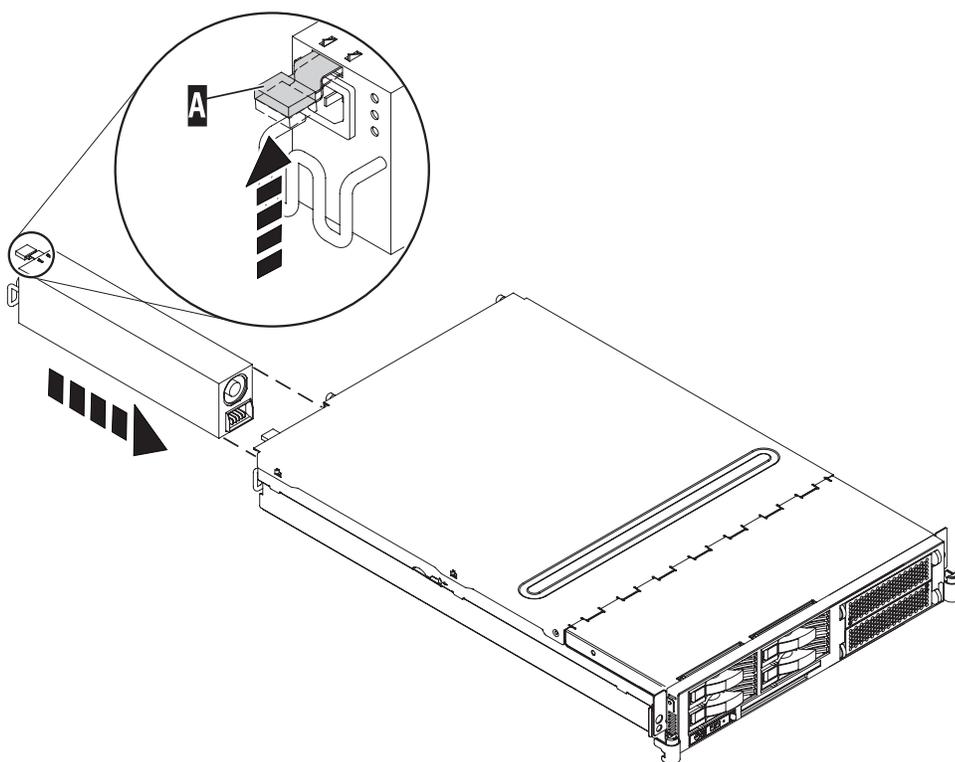
To replace a power supply complete the following steps:

1. If you have not previously removed the power supply, do so now. See “Remove the model 51x or 710 power supply” on page 19.

**Attention:**

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

2. As shown in Figure 17, grasp the power supply handle **A** and carefully insert the new power supply into the power supply bay.



IPHBD952-0

*Figure 17. Install a power supply*

3. Slowly press the power supply into the system. The power supply tab will snap into place, which indicates that the power supply is seated correctly and locked into position.
4. Reconnect the power cable at the back of the power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the cable bar, before you plug it into the back of the server. For an example, see Figure 18 on page 23.

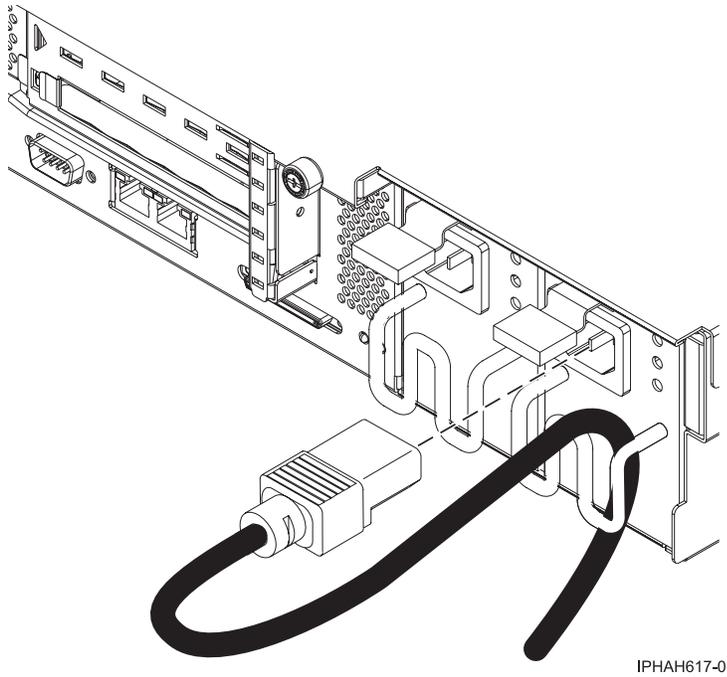
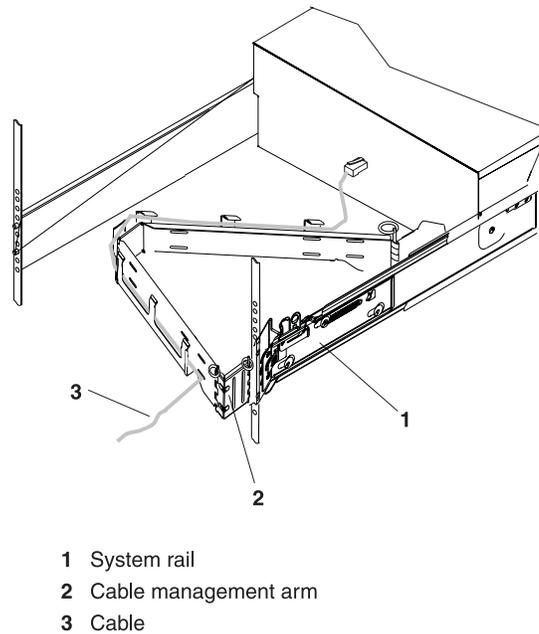


Figure 18. Route the power cable through the bar

5. Note the state of the light-emitting diodes (LEDs) on the power supply. For information about the states of the power supply LEDs, read “Power supply LEDs” on page 74.

If the LEDs indicate that the power supply is operating normally, continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 22. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

6. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



IPHAH615-0

Figure 19. Cables routed through the cable-management arm

7. Reconnect the cables at the back of the system.
8. On a rack-mounted system unit, close the back rack door.
9. If the system was stopped, “Start the system or logical partition” on page 87.

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## Model 285 or 52x power supply

Learn how to install, or remove and replace a power supply.

The following procedures describe the installation, removal, and replacement of the power supply. The model 52x server can have up to two power supplies.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Install or replace a model 52x power supply with power on

Learn how to install a second power supply, or replace one of two power supplies present in the system. Use the procedure in this section to accomplish this task.

This procedure is intended to be used with a model with two power supplies. The system power can remain on under the following conditions:

- When installing a second power supply.
- When one of the two power supplies present in the system must be replaced.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a power supply. For instructions, see “Install a feature using the Hardware Management Console” on page 116.

To install a second power supply or to replace a failing power supply when two are present in the system, do the following procedure:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.
3. If a failing power supply is present, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
4. Disconnect the power cable from the failing power supply at the back of the system.

**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. “Place the rack-mounted system or expansion unit in the service position” on page 95.
  6. “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 101.
  7. Ensure that the power supply bay is empty by doing one of the following steps:
    - a. Remove the power supply filler **A** by grasping the handle and pulling the filler inward in the direction of the arrows and then out of the system.

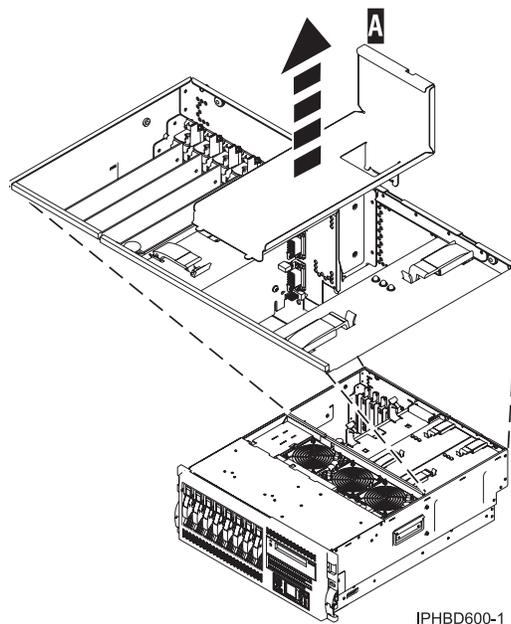
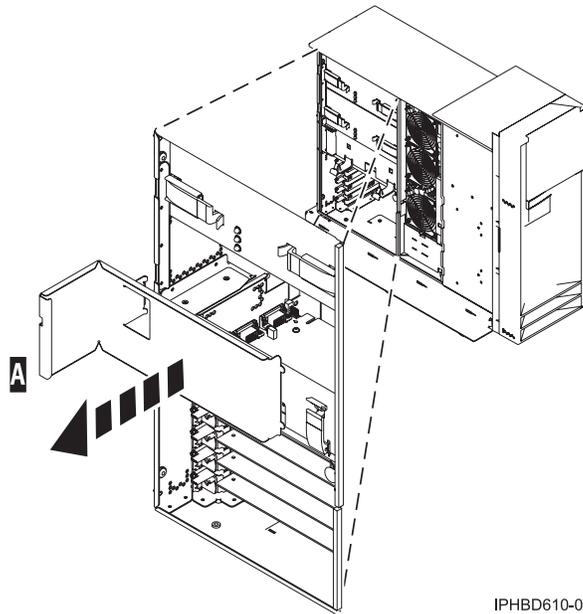


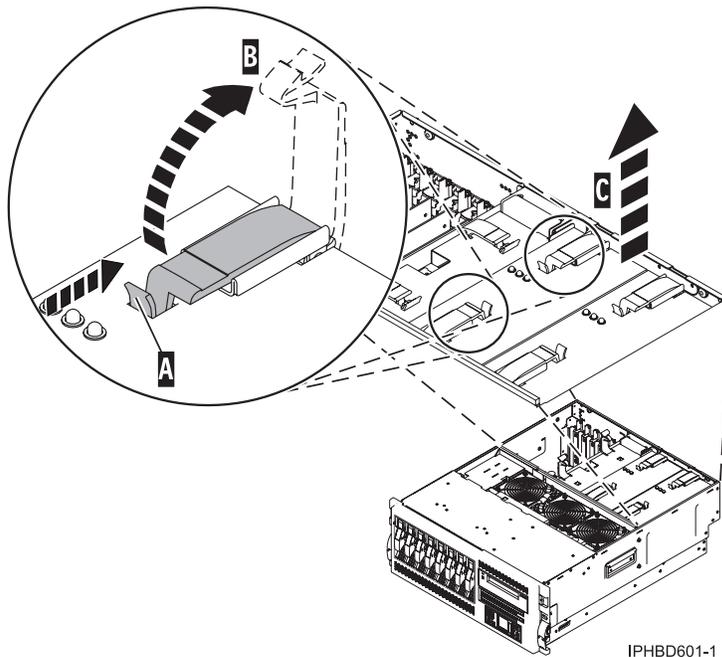
Figure 20. Remove a power supply filler t



IPHBD610-0

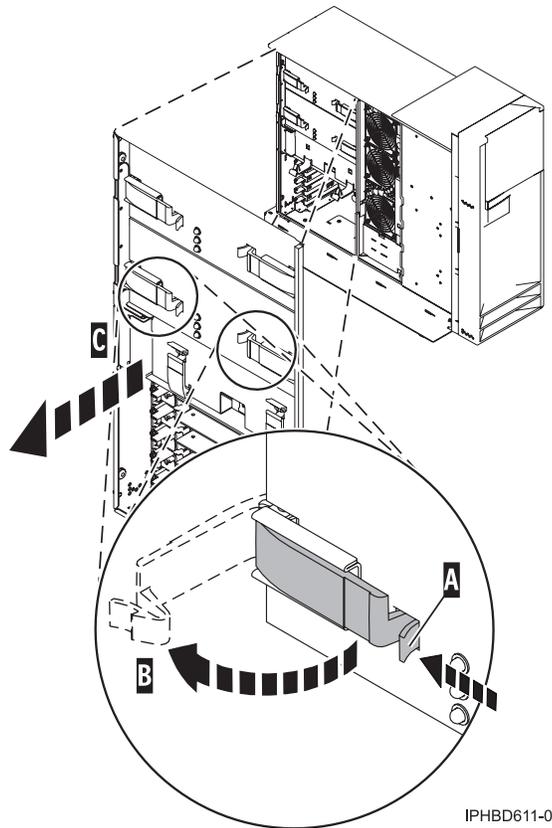
Figure 21. Remove a power supply filler

- b. Remove a failing power supply by doing the following:
- 1) Squeeze the tabs on the power supply handles **A** as shown in Figure 22 or Figure 23 on page 27, and then slowly rotate the handles **B** to the open position to release the power supply from the system.
  - 2) After the power supply is released, use the power supply handles to pull the power supply **C** out of the system.



IPHBD601-1

Figure 22. Remove a power supply from a rack-mounted model



IPHBD611-0

*Figure 23. Remove a power supply from a stand-alone model*

8. Open the power supply handles located on the top of the new power supply.
9. As shown in Figure 24 on page 28 or Figure 25 on page 29, grasp the power supply handles and carefully insert the new power supply **A** into the power supply bay.
10. Slowly press the power supply into the system. The power supply handle tabs will snap into place, which indicates that the power supply is seated correctly and locked into position **B**.

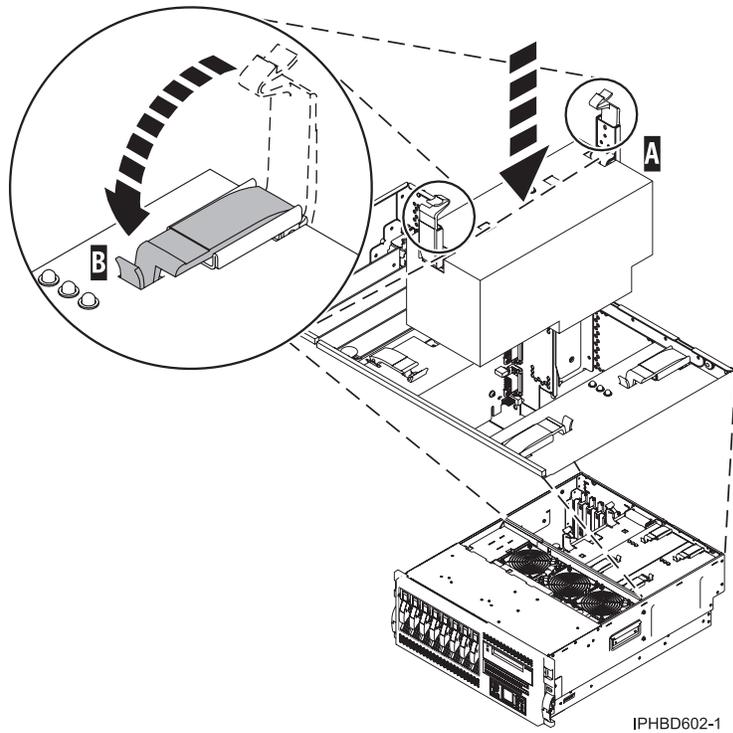
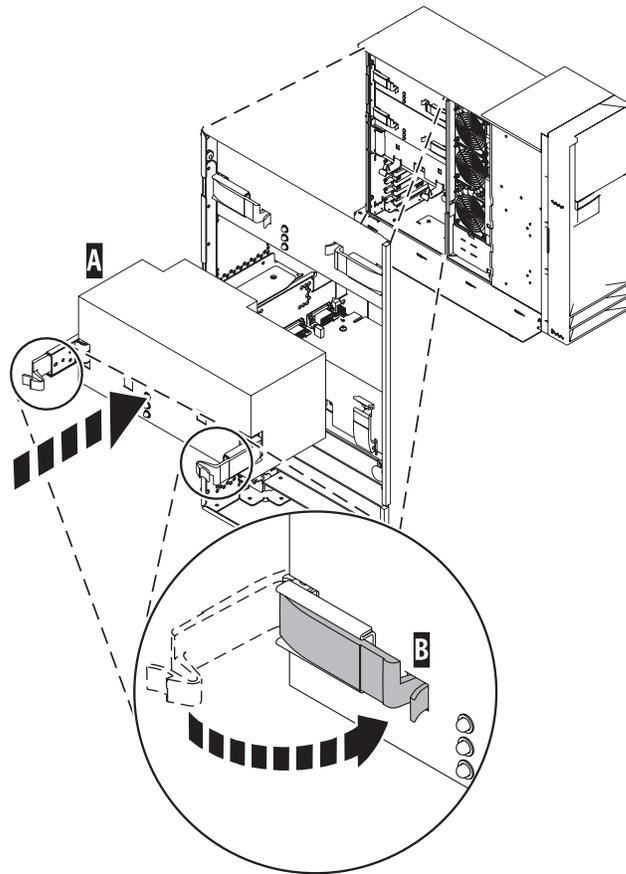


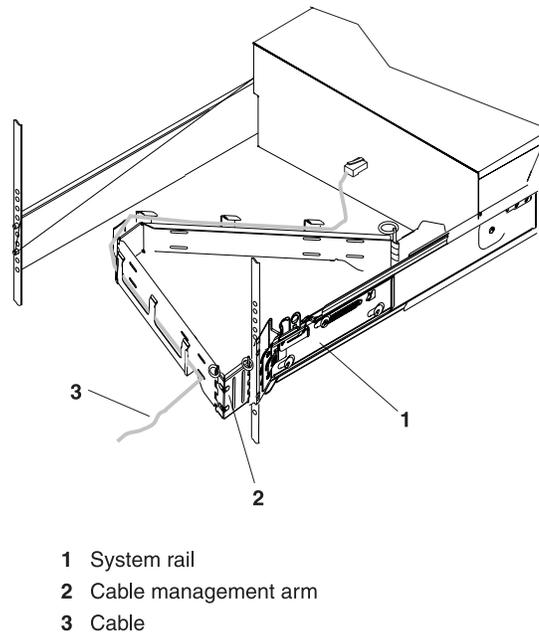
Figure 24. Install a power supply in a rack-mounted system model



IPHBD612-0

Figure 25. Install a power supply in a stand-alone model

11. If you are installing a second power supply feature, plug the second power cable into the back of the new power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring, if provided, before you plug it into the back of the server. For an example, see Figure 50 on page 60 in “Replace the model 9116-561 or 570 power supply with power on” on page 58.
12. Connect the power source to the system.
13. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read “Power supply LEDs” on page 74. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 9 on page 27. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
14. Replace the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 104.
15. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



IPHAH615-0

Figure 26. Cables routed through the cable-management arm

16. If you have a rack-mounted system unit, “Place the rack-mounted system or expansion unit in the operating position” on page 99.
17. Reconnect the cables at the back of the system.
18. On a rack-mounted system unit, close the back rack door.

## Remove and replace a model 285 or 52x power supply with power off

Learn how to install a feature that requires removal of the power supplies, or how to replace the primary or only power supply present in a system unit. Use the instructions in this section to perform these tasks.

A power supply is removed and replaced while the system power is off under the following conditions:

- The primary power supply has failed and a secondary power supply is not present in the system.
- The power supply must be removed from the system to repair another part of the system.

The IntelliStation® POWER® 285 server has only one power supply that must be removed and replaced while the system power is off.

## Remove the model 285 or 52x power supply

Learn how to remove a power supply with the system power off to replace a failed unit or as a part of another service action. Use procedure in this section to accomplish this task.

To remove a power supply while the system power is off, complete the following steps:

**Attention:** If you are removing a redundant power supply and are not going to replace that power supply you must insert a power supply filler for proper cooling. Failure to do so could cause the system to fail or damage the system components.

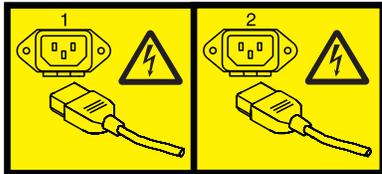
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a power supply. For instructions, see “Remove a part using the Hardware Management Console” on page 117.

To remove a power supply while the system power is off, do the following procedure:

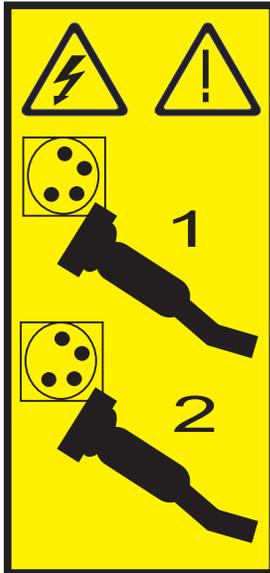
1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If you are removing the power supply as part of another procedure, continue to the next step. If you are removing the power supply because it is not operational, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, “Stop the system or logical partition” on page 89.
4. On a rack-mounted system unit, open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**Note:** This system is 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



6. If you are servicing a rack-mounted system unit, “Place the rack-mounted system or expansion unit in the service position” on page 95.
7. “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 101.
8. Wait at least 10 seconds before performing the next step.

**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.
9. As shown in Figure 27 or Figure 28 on page 33, squeeze the tabs on the power supply handles **A** and then slowly rotate the handles **B** to release the power supply or filler from the system. For a model 285, see Figure 29 on page 34.
  10. After the power supply is released, use the power supply handles to pull the power supply **C** out of the system.

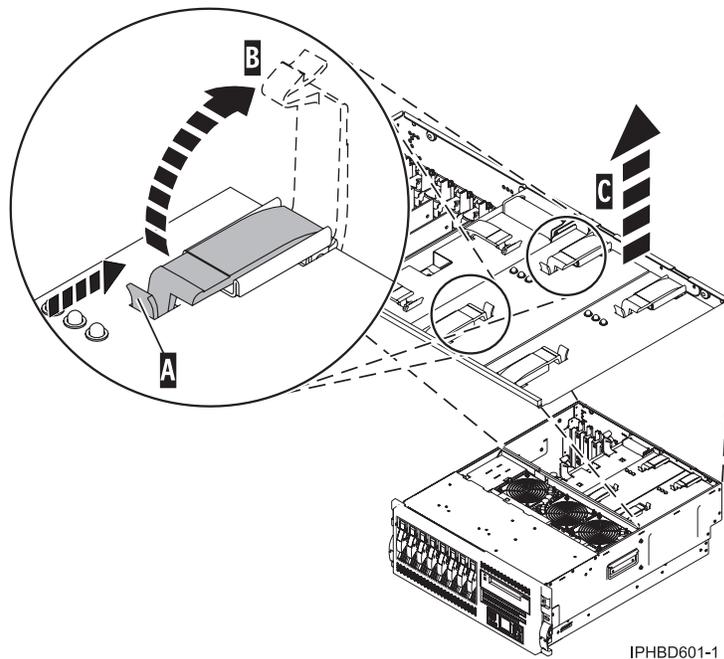
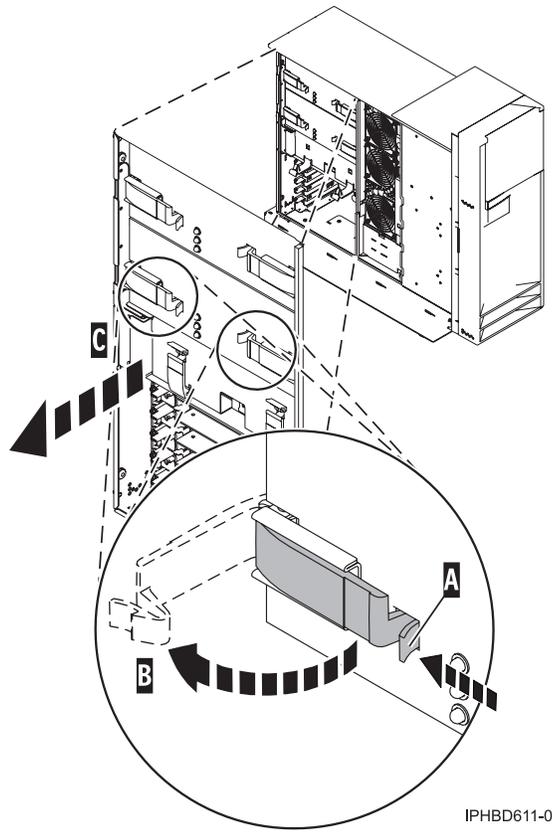
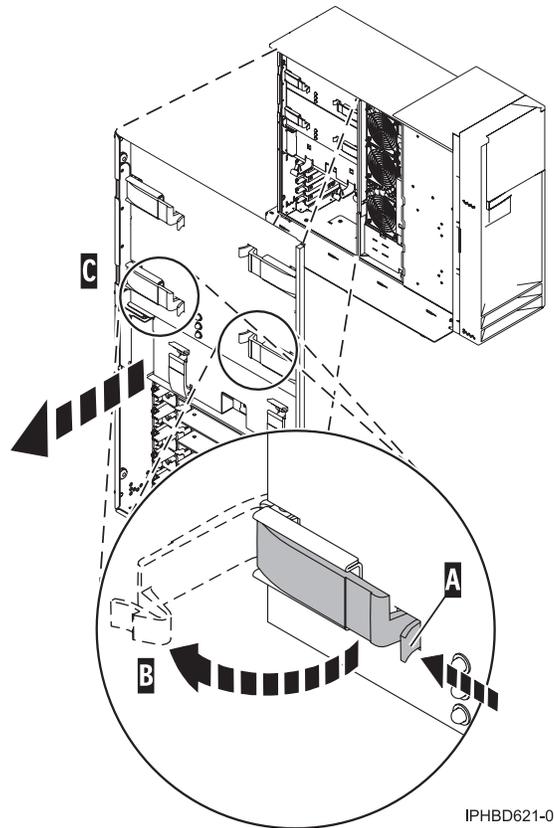


Figure 27. Power supply removal from a rack-mounted system unit



IPHBD611-0

Figure 28. Power supply removal from a stand-alone system unit



IPHBD621-0

Figure 29. Power supply removal from a model 285 stand-alone system unit

## Replace the model 285 or 52x power supply

Learn how to correctly replace a power supply with the system power off. Use the procedure in this section to accomplish this task.

### Notes:

1. Do not connect the power cables to the power source until you are instructed to do so.
2. During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

To replace a power supply complete the following steps:

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a power supply. For instructions, see “Replace a part using the Hardware Management Console” on page 118.

To replace a power supply, do the following procedure:

1. If you have not previously removed the power supply, do so now. See “Remove the model 285 or 52x power supply” on page 30.

**Attention:**

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Open the power supply handles **A** on the top of the new power supply as shown in Figure 30 or Figure 30. For a model 285, see Figure 29 on page 34.
  3. Grasp the power supply handles and carefully insert the new power supply **A** into the power supply bay. For a model 285, see Figure 29 on page 34.
  4. Slowly press the power supply into the system. The power supply handle tabs **A** will snap into place, which indicates that the power supply is seated correctly and locked into position **B**.

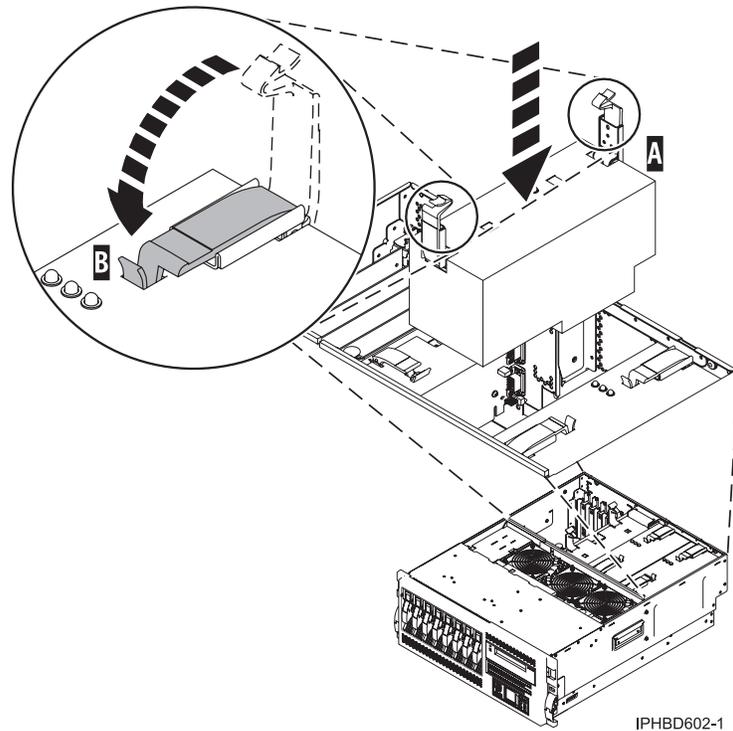
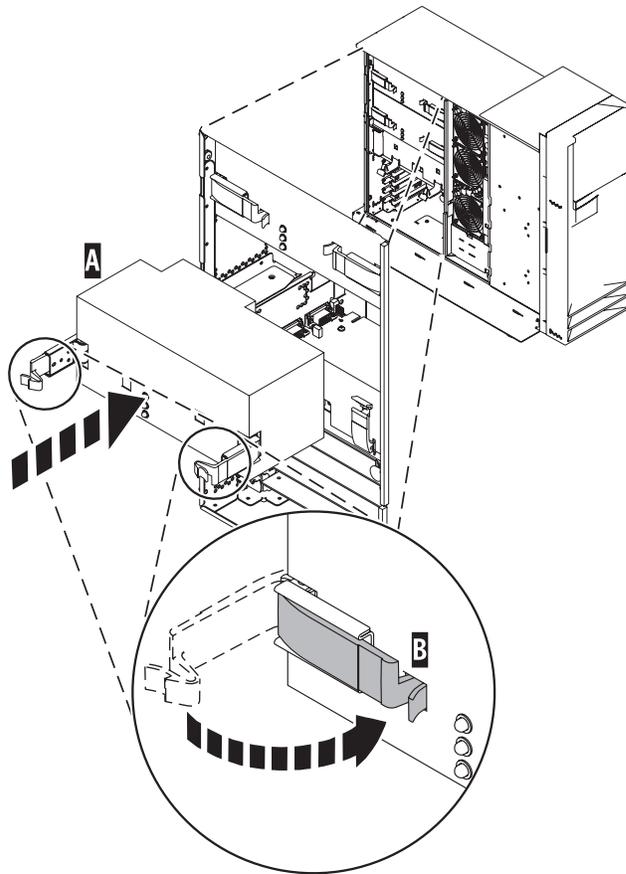
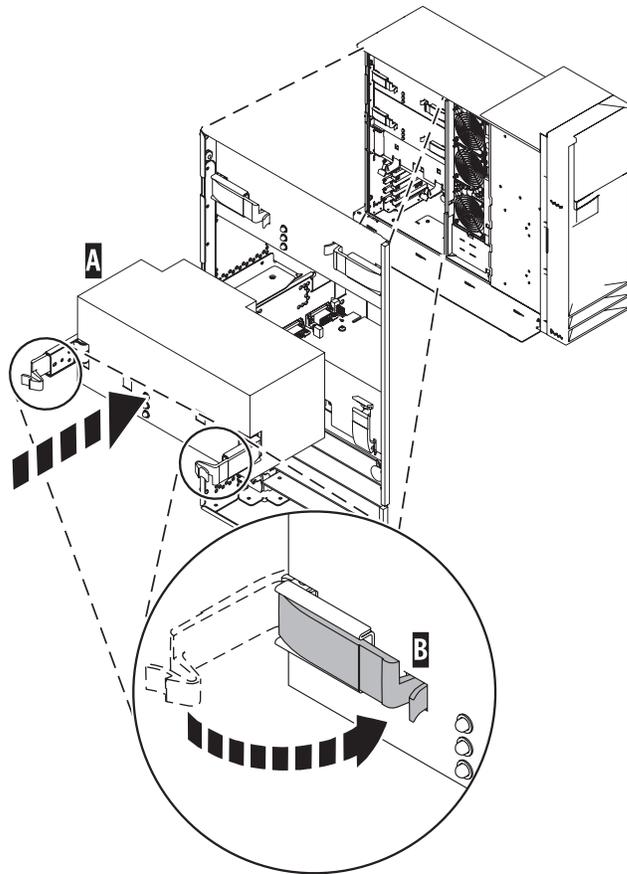


Figure 30. Replace a power supply in a rack-mounted system unit



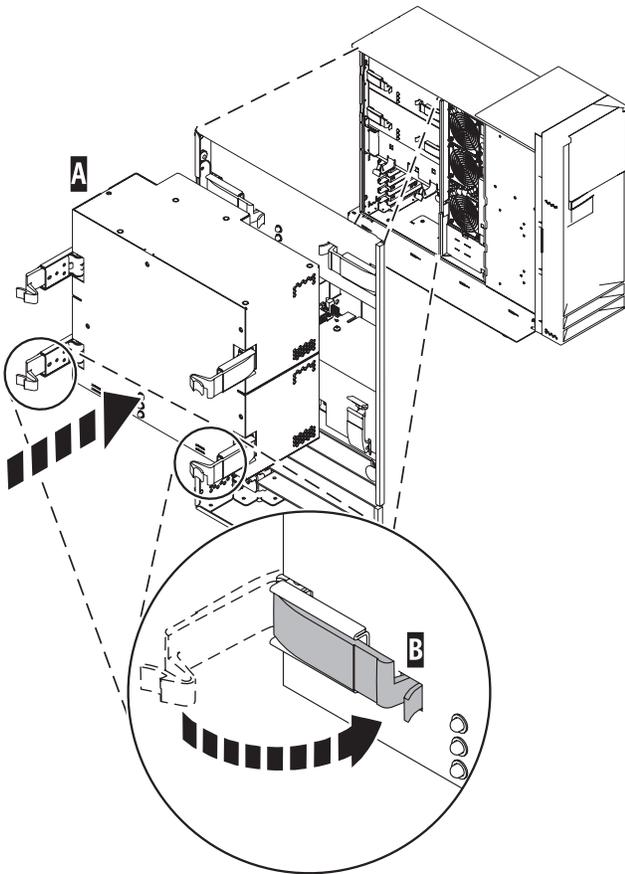
IPHBD612-0

Figure 31. Replace a power supply in a stand-alone system unit



IPHBD612-0

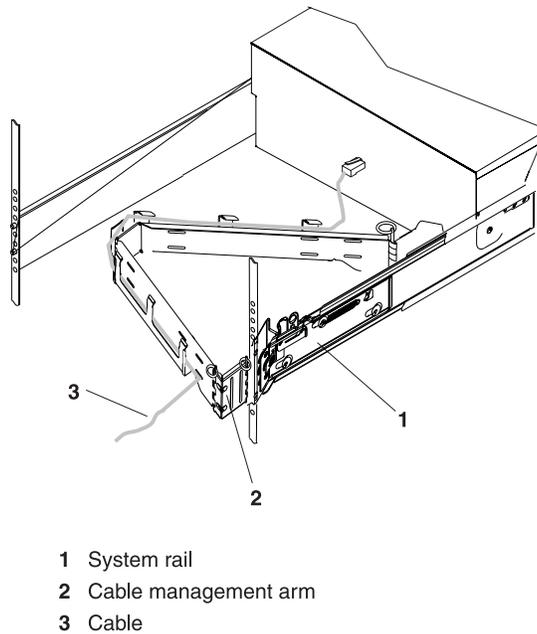
Figure 32. Replace a power supply in a model 285 stand-alone system unit



IPHBD622-0

Figure 33. Replace a double wide power supply in a stand-alone system unit

5. Reconnect the power cable at the back of the power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring, if provided, before you plug it into the back of the server. For an example, see Figure 50 on page 60 in “Replace the model 9116-561 or 570 power supply with power on” on page 58.
6. Note the state of the light-emitting diodes (LEDs) on the power supply. For information about the states of the power supply LEDs, read “Power supply LEDs” on page 74. If the LEDs indicate that the power supply is operating normally, continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 35. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
7. Replace the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 104.
8. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



IPHAH615-0

Figure 34. Cables routed through the cable-management arm

9. If you are servicing a rack-mounted model 520 system unit, place the rack-mounted system or expansion unit in the operating position. For instructions, see “Place the rack-mounted system or expansion unit in the operating position” on page 99.
10. Reconnect the cables at the back of the system.
11. On a rack-mounted system unit, close the back rack door.
12. If the system was stopped, “Start the system or logical partition” on page 87.

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## Model 55x or 720 power supply

Learn how to install, or remove and replace the power supply.

These servers can have up to two power supplies.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Install or replace a model 55x or 720 power supply with power on

Learn how to install a second power supply, or replace one of two power supplies present in the system. Use the procedure in this section to accomplish this task.

The following procedure describes how to install a power supply or replace a power supply when two power supplies are present. The system power can remain on under either of the following conditions:

- You are installing a second power supply.
- One of the two power supplies present in the system must be replaced.

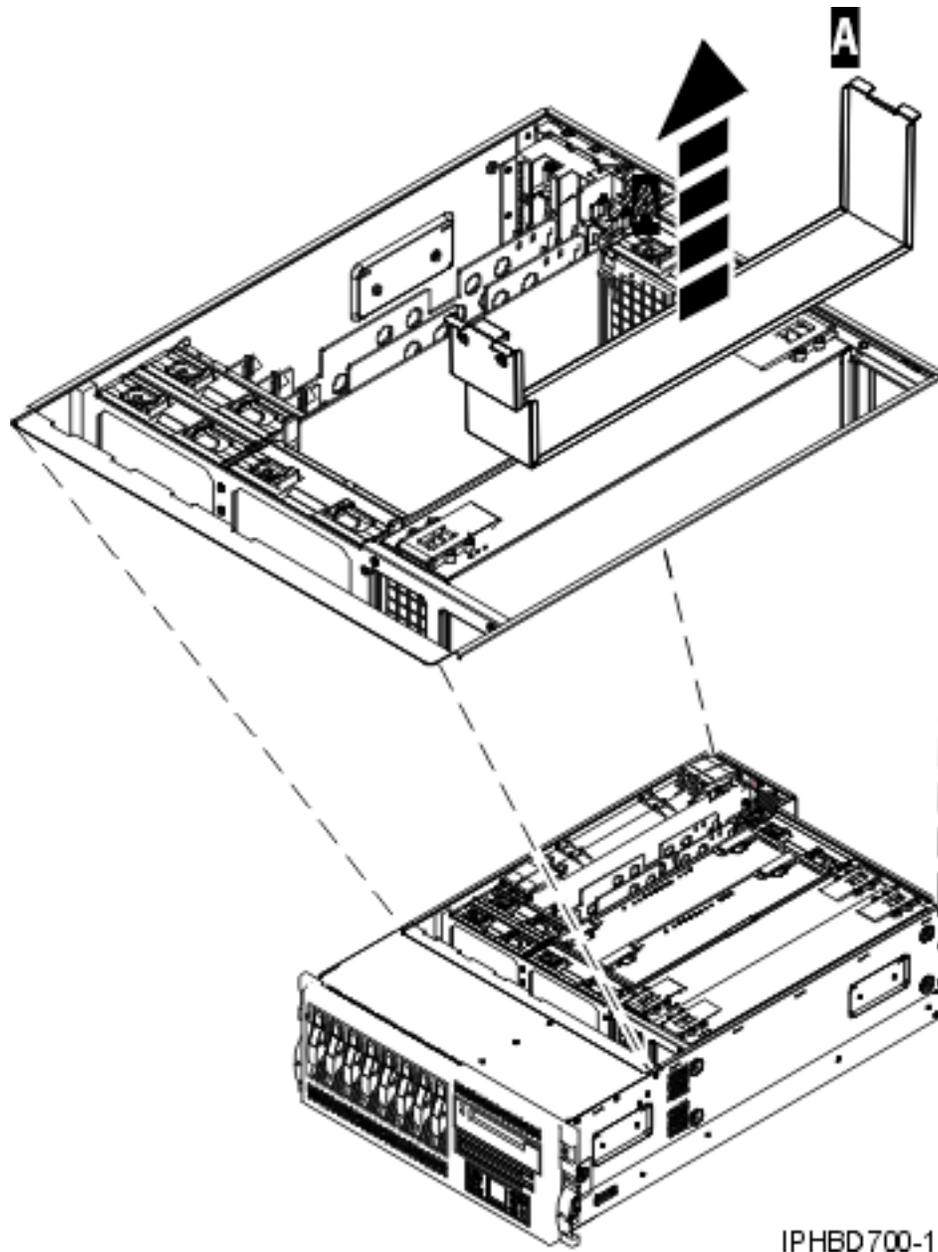
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a power supply. For instructions, see “Install a feature using the Hardware Management Console” on page 116.

To install a second power supply or to replace a failing power supply when two are present in the system, do the following procedure:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.
3. If a failing power supply is present, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
4. Disconnect the power cable from the failing power supply at the back of the system.

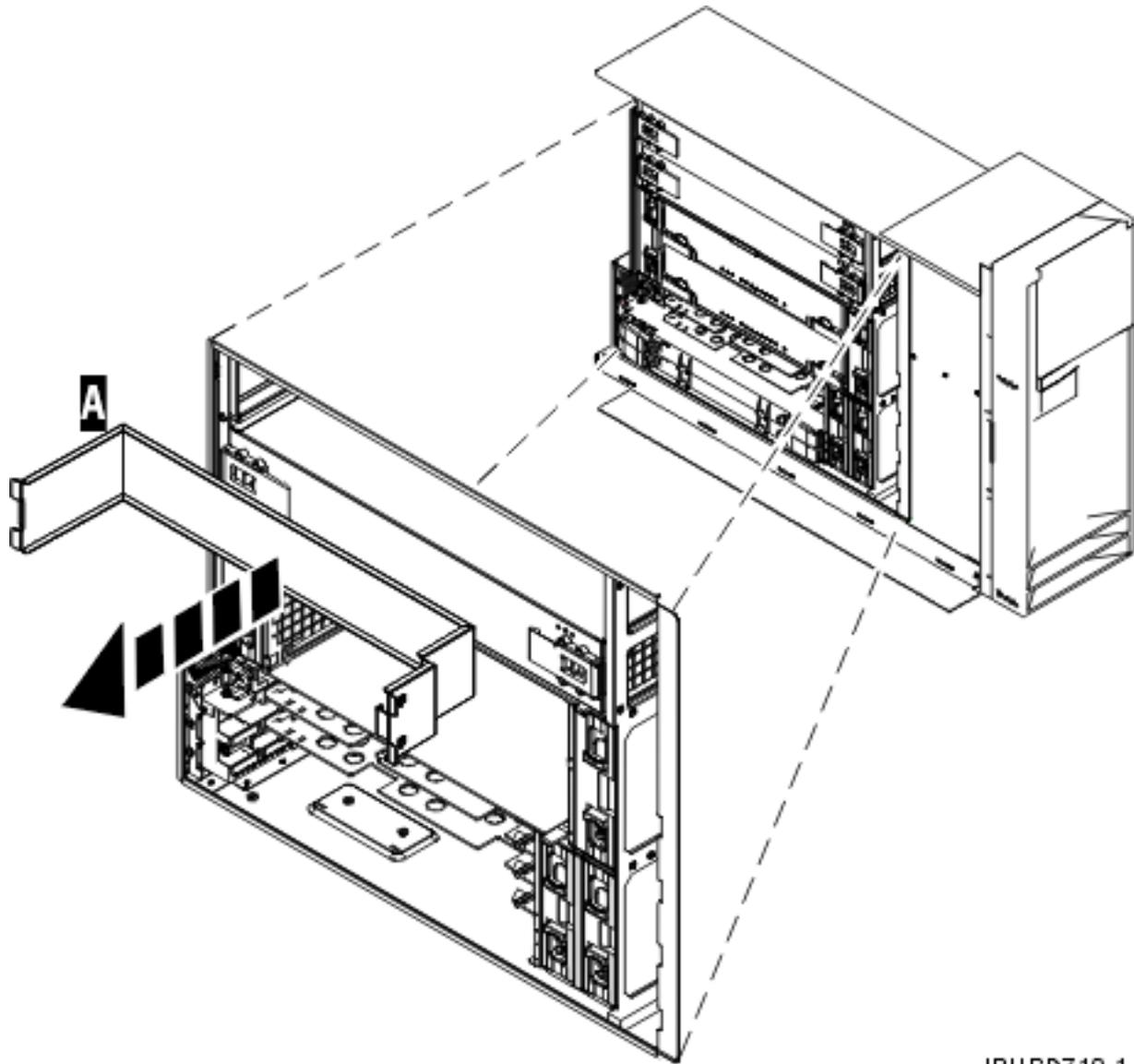
**Attention:**

- 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. “Place the rack-mounted system or expansion unit in the service position” on page 95.
  6. Remove the service access cover. For instructions, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 101.
  7. Ensure that the power supply bay is empty by doing one of the following methods:
    - a. Remove the power supply filler **A** by grasping the handle and pulling the filler inward in the direction of the arrows and then out of the system.



IPHBD700-1

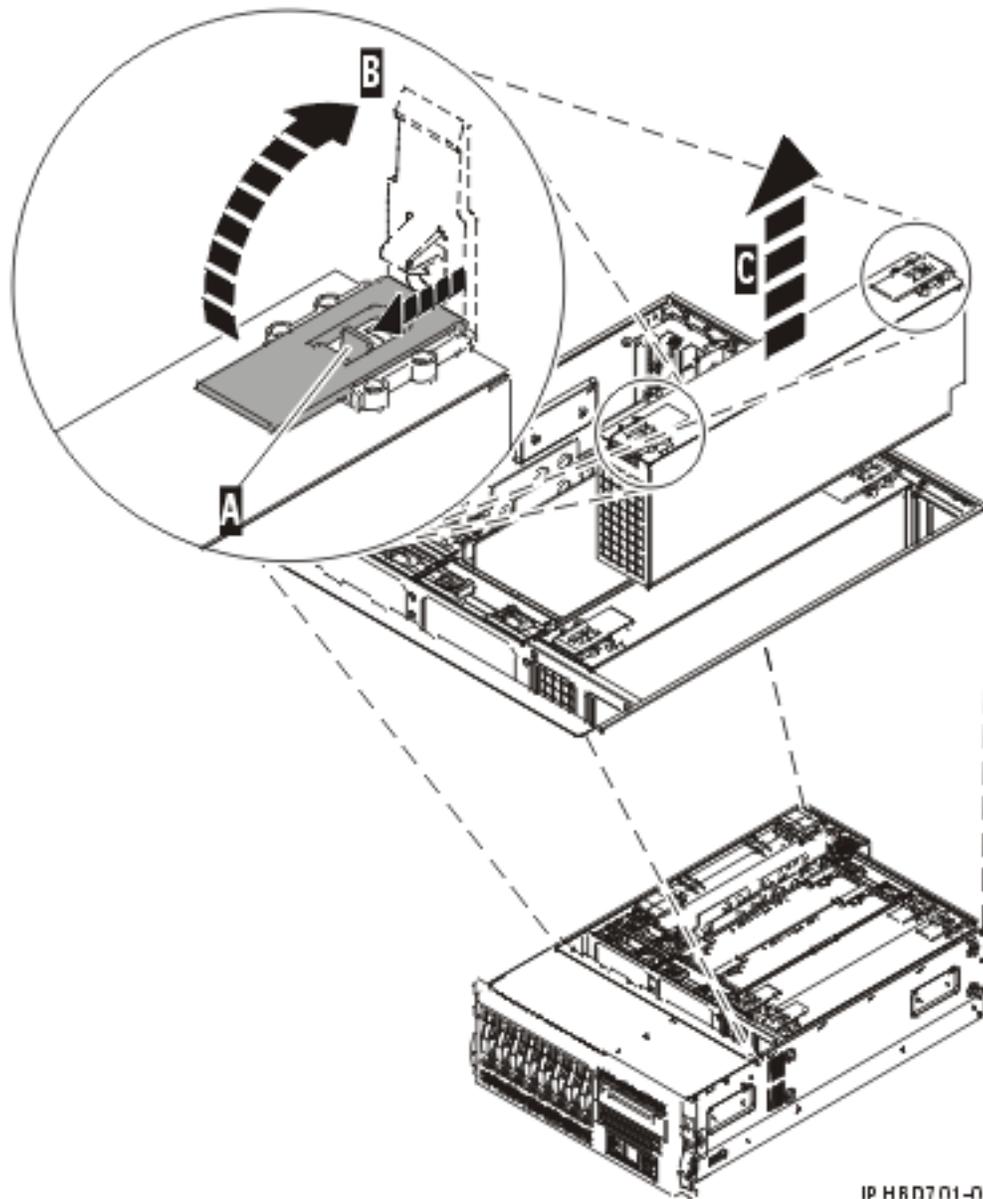
Figure 35. Remove a power supply filler from a rack-mounted system unit



IPHBD710-1

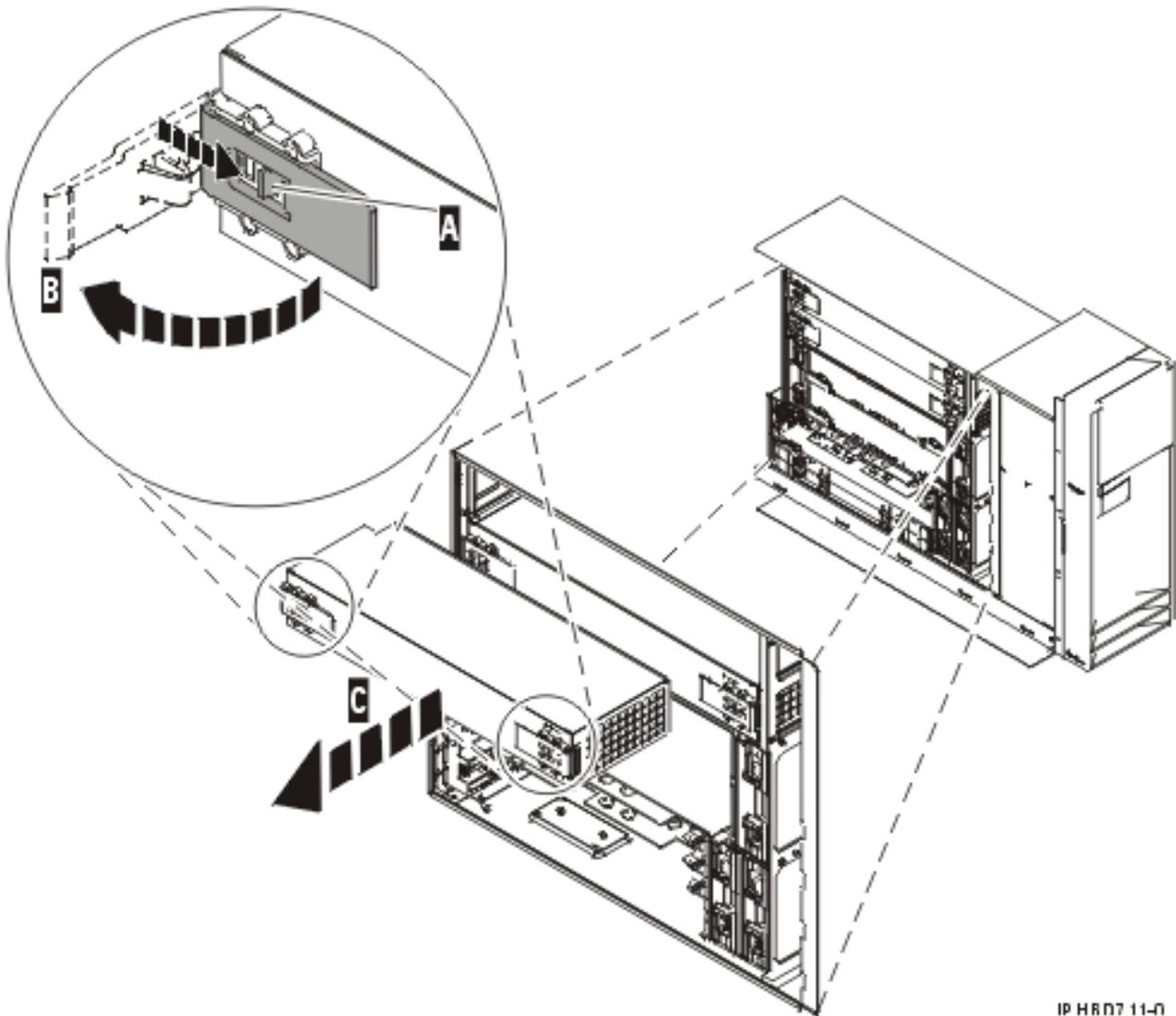
Figure 36. Remove a power supply filler from a stand-alone system unit

- b. Remove a failing power supply by doing the following steps:
  - 1) Squeeze the tabs on the power supply handles **A** as shown in Figure 37 on page 43 or Figure 38 on page 44 and then slowly rotate the handles **B** to the open position to release the power supply from the system.
  - 2) After the power supply is released, use the power supply handles to pull the power supply **C** out of the system.



IP H80701-0

Figure 37. Remove a power supply from a rack-mounted system unit



IP HR07 11-0

Figure 38. Remove a power supply from a stand-alone system unit

8. Open the power supply handles on top of the new power supply.
9. As shown in Figure 39 on page 45 or Figure 40 on page 46, grasp the power supply handles and carefully insert the new power supply **A** into the power supply bay.
10. Slowly press the power supply into the system. The power-supply-handle tabs will snap into place, which indicates that the power supply is seated correctly and locked into position **B**.

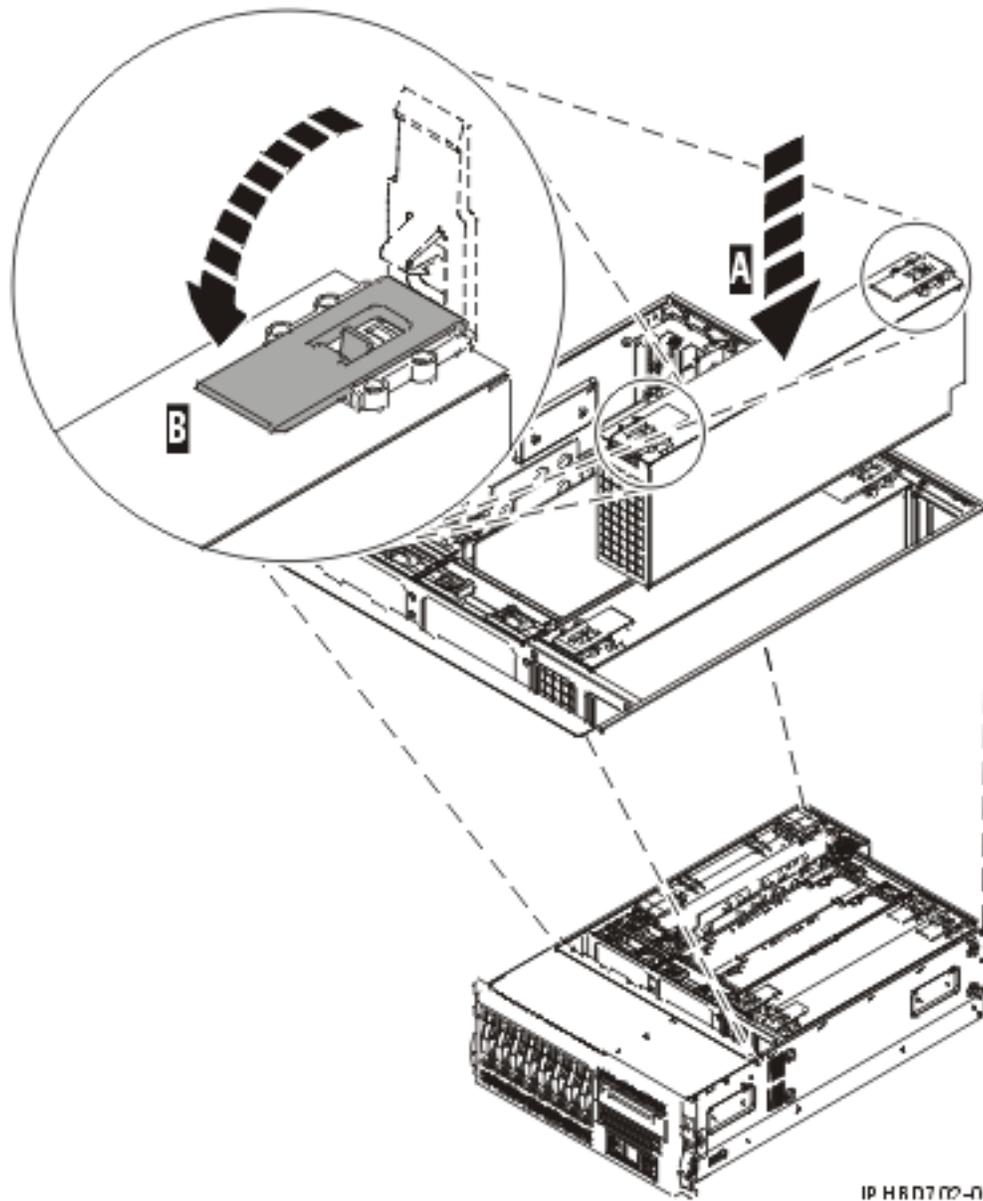
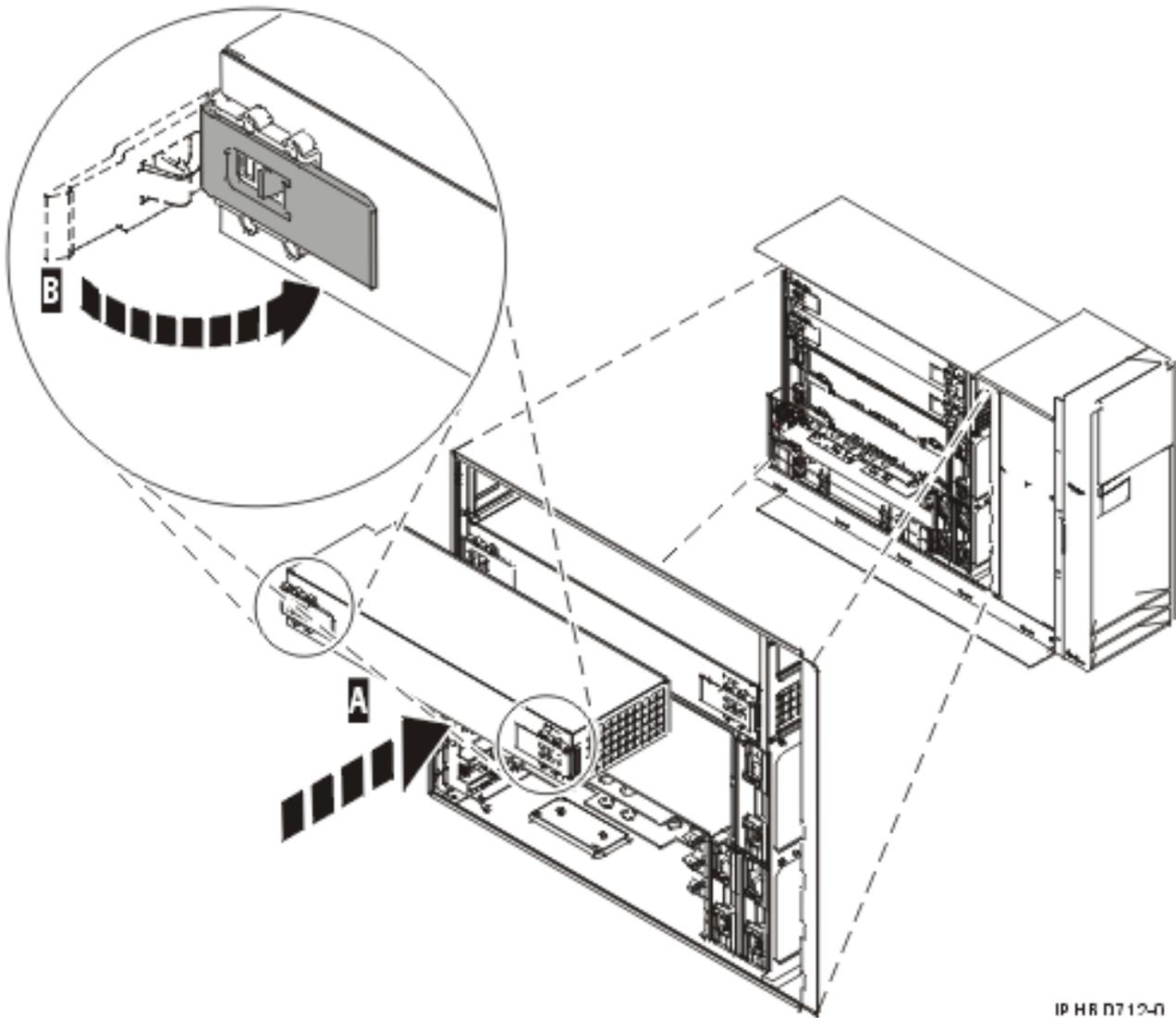


Figure 39. Install a power supply in a rack-mounted system unit



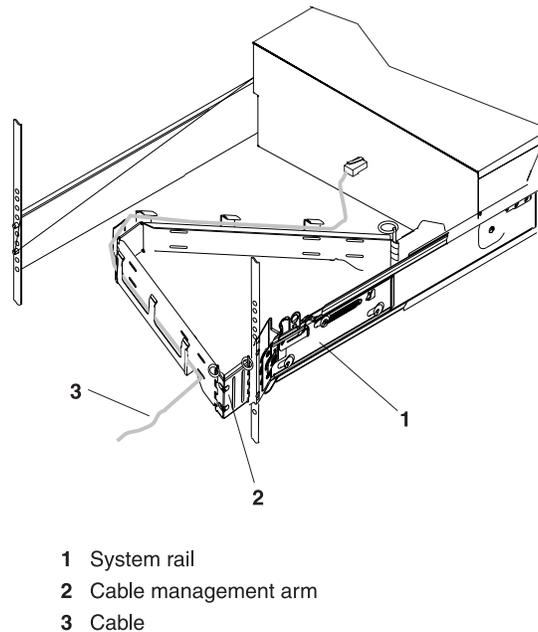
IP HR 0712-0

Figure 40. Install a power supply in a stand-alone system unit

**Tip:** You might need to press down firmly on the power supply after the handles lock into place to assure it is completely seated.

11. If you are installing a second power supply feature, plug the second power cable into the back of the new power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring, if provided, before you plug it into the back of the server. For an example, see Figure 50 on page 60 in “Replace the model 9116-561 or 570 power supply with power on” on page 58.
12. Connect the power source to the system.
13. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read “Power supply LEDs” on page 74. If the LEDs indicate that the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 9 on page 44. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
14. Replace the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 104.

15. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



IPHAH615-0

Figure 41. Cables routed through the cable-management arm

16. If you have a rack-mounted system unit, place the rack-mounted system or expansion unit in the operating position. Refer to “Place the rack-mounted system or expansion unit in the operating position” on page 99.
17. Reconnect the cables at the back of the system.
18. On a rack-mounted system unit, close the back rack door.

## Remove and replace the model 55x or 720 power supply with power off

Learn how to install a second power supply, or replace one of two power supplies present in the system.

The following procedures describe the removal and replacement of a power supply while the system power is off. This system can have up to two power supplies. A power supply is removed and replaced with the system power off under the following conditions:

- The primary power supply has failed and a secondary power supply is not present in the system.
- The power supply must be removed from the system to repair another part of the system.

### Remove the model 55x or 720 power supply

Learn how to remove a power supply with the system power off to replace a failing unit or as a part of another service action. Use the procedure in this section to accomplish this task.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a power supply. For instructions, see “Remove a part using the Hardware Management Console” on page 117.

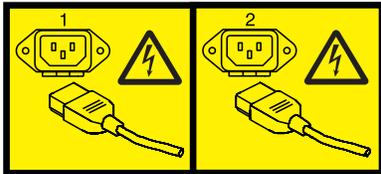
**Note:** If you are removing a redundant power supply, and are not going to replace that power supply, you will need to place a power supply filler into the empty bay for proper airflow and electromagnetic compatibility (EMC) shielding.

To remove a power supply while the system power is off, complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If you are removing the power supply as part of another procedure, continue to the next step. If you are removing the power supply because it is not operational, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, “Stop the system or logical partition” on page 89.
4. On a rack-mounted system unit, open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**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)



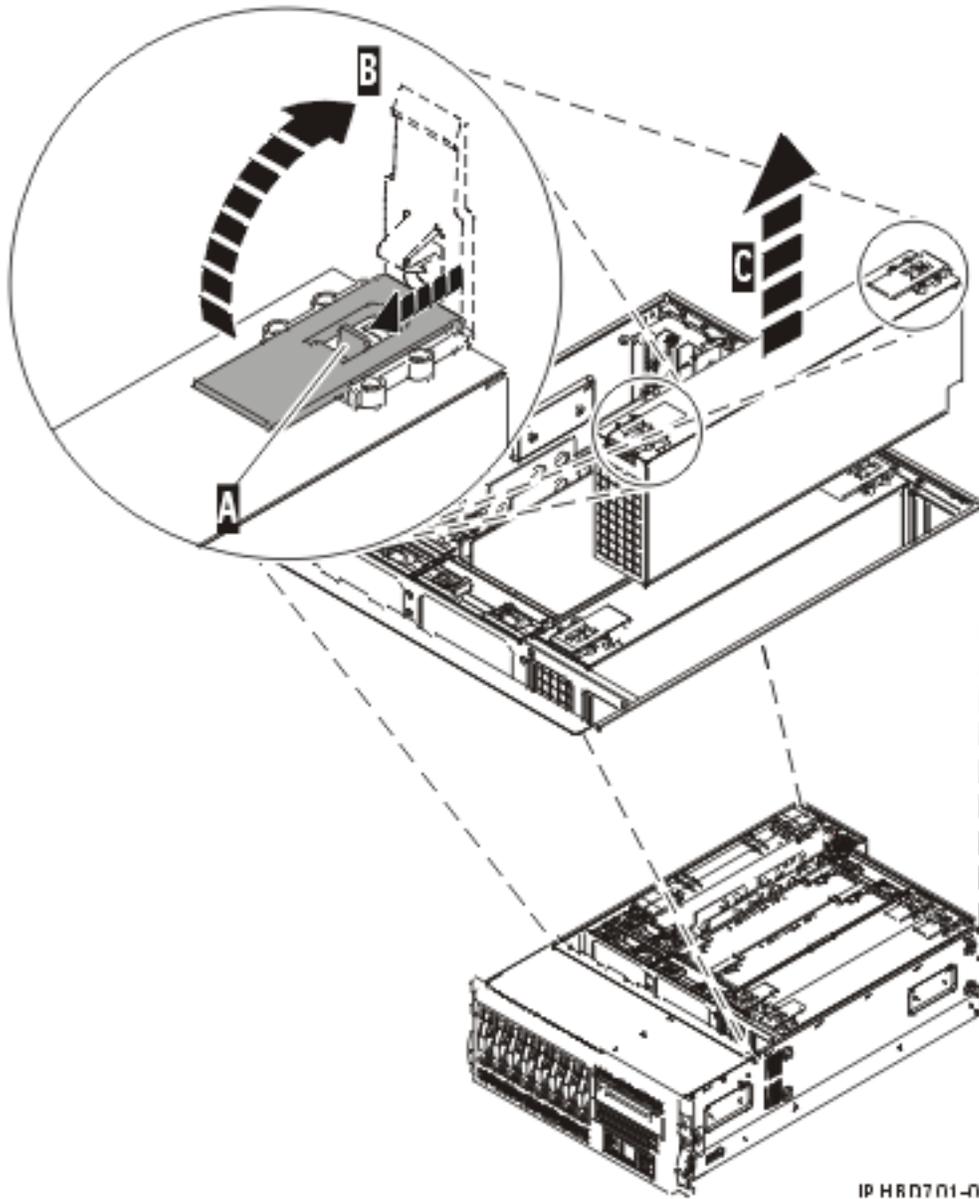
or



6. If you are servicing a rack-mounted system unit, place the rack-mounted system or expansion unit in the service position. For instructions, see “Place the rack-mounted system or expansion unit in the service position” on page 95.
7. Remove the service access cover, see “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 101.
8. Wait at least 10 seconds before performing the next step.

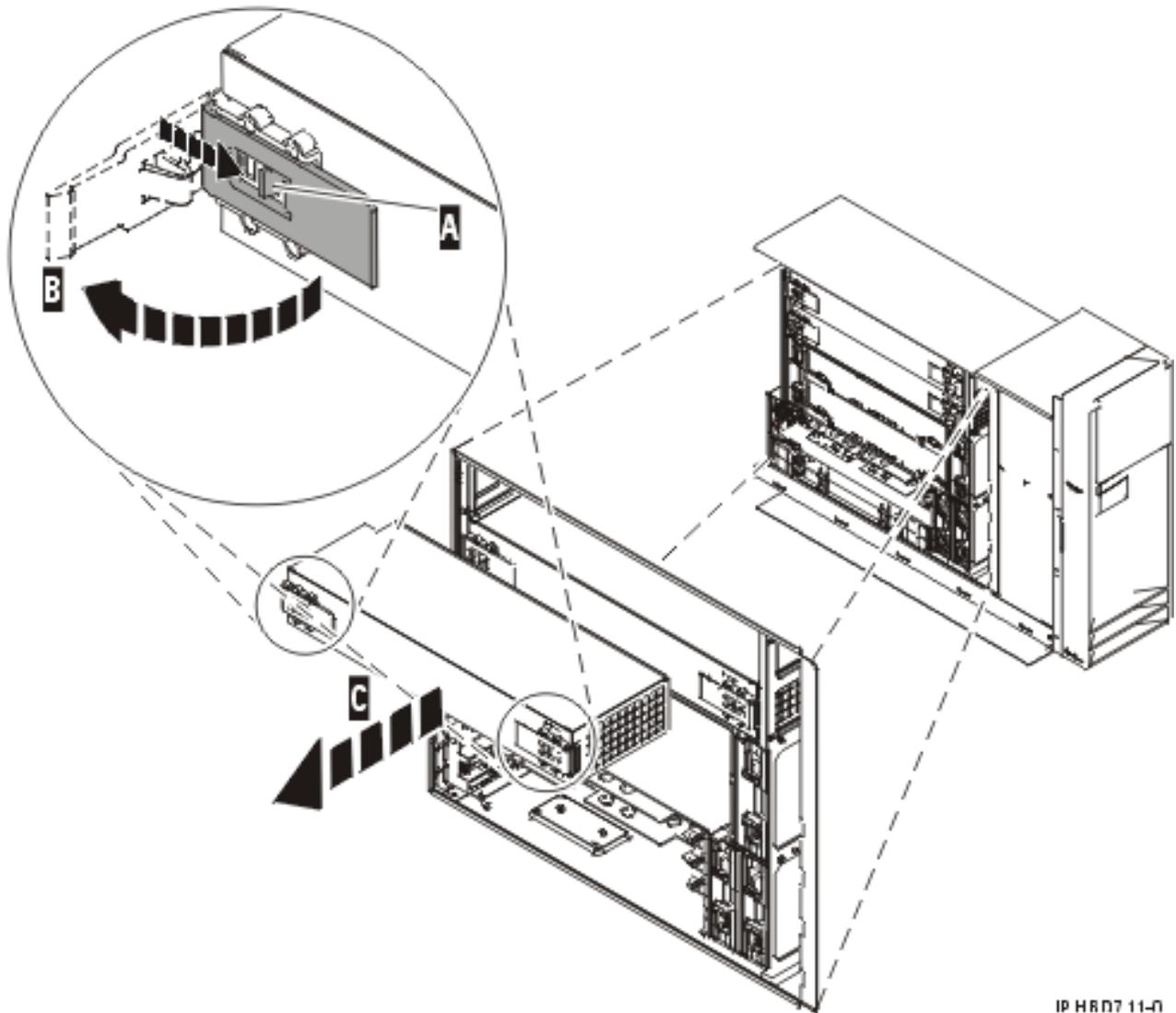
**Attention:**

- 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.
9. As shown in Figure 42 on page 50 or Figure 43 on page 51, squeeze the tabs on the power supply handles **A** and then slowly rotate the handles to release the power supply or filler from the system **B**.
  10. After the power supply is released, use the power supply handles to pull the power supply out of the system **C**.



IP H80701-0

Figure 42. Remove a power supply from rack-mounted system unit



IP HR07 11-0

Figure 43. Remove a power supply from a stand-alone system unit

## Replace the model 55x or 720 power supply

Learn how to correctly replace a power supply with the system power off.

### Notes:

1. Do not connect the power cables to the power source until you are instructed to do so.
2. During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

To replace a power supply complete the following steps:

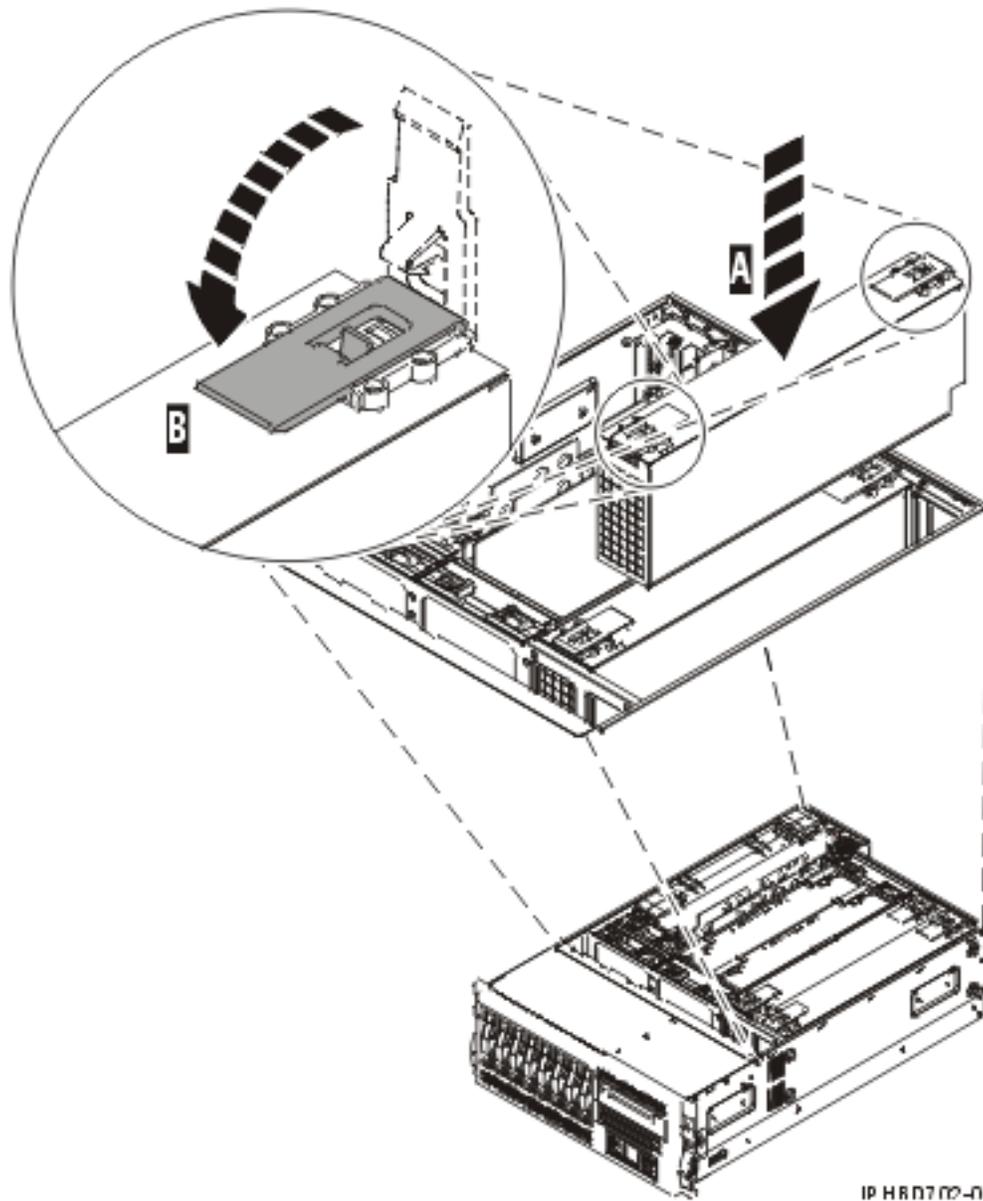
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a power supply. For instructions, see “Replace a part using the Hardware Management Console” on page 118.

To replace a power supply, do the following steps:

1. To remove the power supply, see “Remove the model 55x or 720 power supply” on page 47.

**Attention:**

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Open the power supply handles on top of the new power supply, see Figure 42 on page 50 or Figure 43 on page 51.
  3. As shown in Figure 44 on page 53 or Figure 45 on page 54, grasp the power supply handles and carefully insert the new power supply **A** into the power supply bay.
  4. Slowly press the power supply into the system. The power supply handle tabs will snap into place, which indicates that the power supply is seated correctly and locked into position **B**.



IP H80702-0

Figure 44. Replace a power supply in a rack-mounted system unit

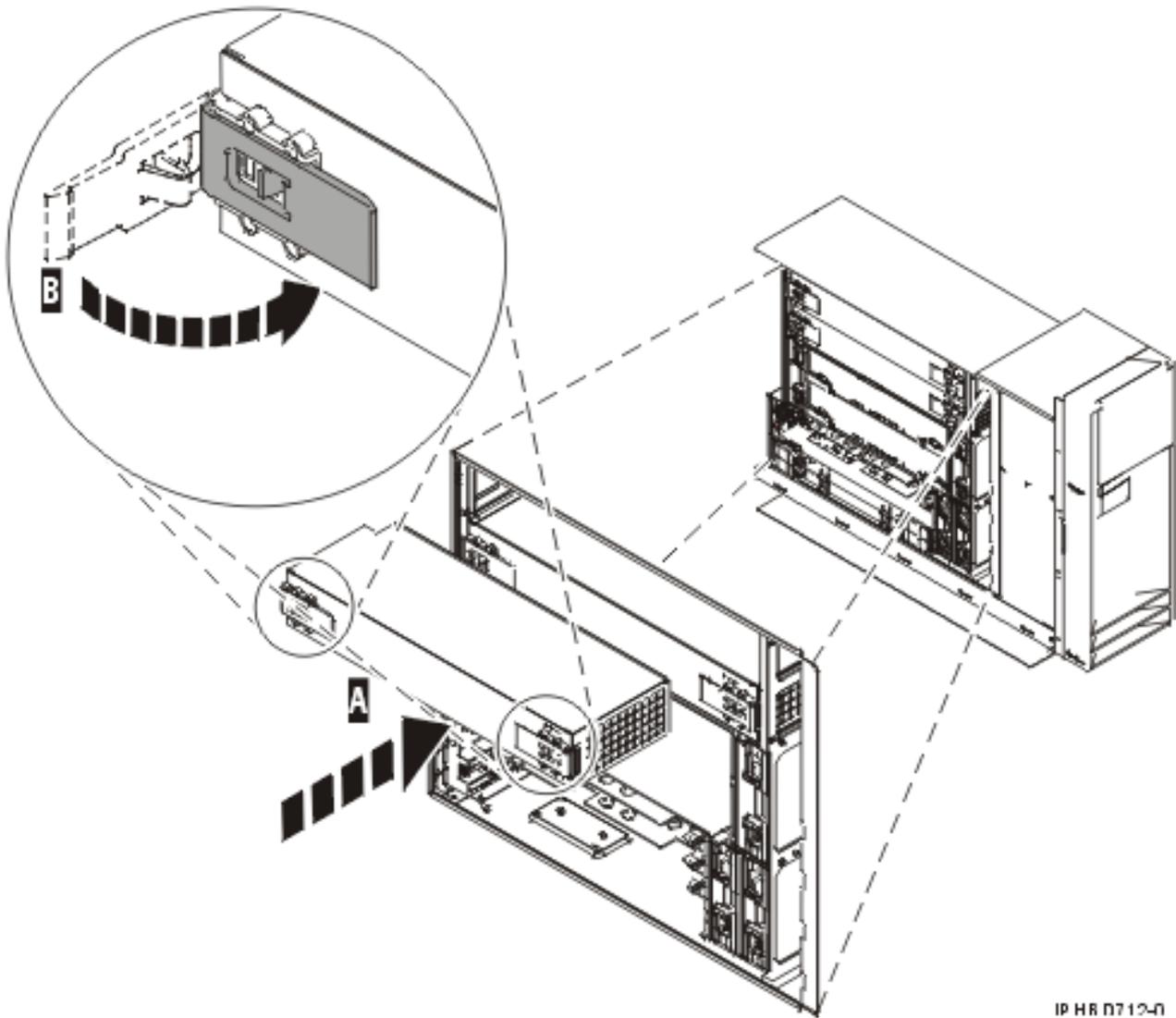
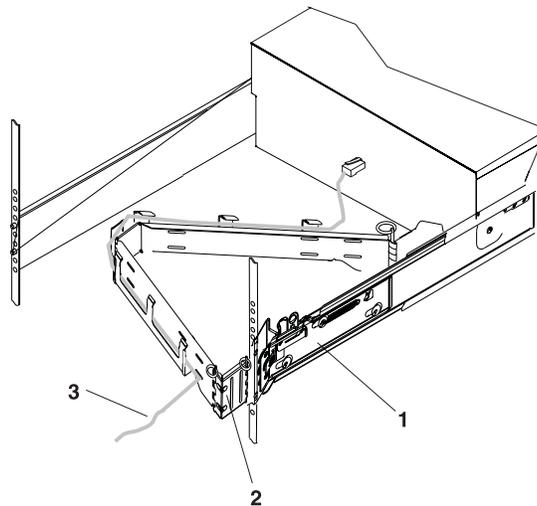


Figure 45. Replace a power supply in a stand-alone system unit

**Tip:** You might need to press down firmly on the power supply after the handles lock into place to assure it is completely seated.

5. Reconnect the power cable at the back of the power supply. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring, if provided, before you plug it into the back of the server. For an example, see Figure 50 on page 60 in “Replace the model 9116-561 or 570 power supply with power on” on page 58.
6. Note the state of the light-emitting diodes (LEDs) on the power supply. For information about the states of the power supply LEDs, read “Power supply LEDs” on page 74.  
If the LEDs indicate that the power supply is operating normally, continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 52. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
7. Replace the service access cover. For instructions, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 104.
8. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



- 1 System rail
- 2 Cable management arm
- 3 Cable

IPHAH615-0

Figure 46. Cables routed through the cable-management arm

9. If you are servicing a rack-mounted system unit, place the rack-mounted system or expansion unit in the service position, see “Place the rack-mounted system or expansion unit in the operating position” on page 99.
10. Reconnect the cables at the back of the system.
11. On a rack-mounted system unit, close the back rack door.
12. If the system was stopped, “Start the system or logical partition” on page 87.
13. If you replaced the power supply as part of another procedure, return to that procedure now.

## Model 9116-561 or 570 power supply

Learn how to remove and replace the power supply.

**Attention:** In order to use the power on procedure for this model you must check to see if you have one of the following adapters installed in slot P1-C6/C7.

- FC 1800 - HSL-2 Ports - 2 Copper
- FC 1801 - HSL-2 Ports - 2 Optical
- FC 1810 - GX Dual-port 4x HCA

Is one of these adapters present in slot P1-C6/C7?

- **Yes:** Check for a label by the slot that indicates specifically that power supply concurrent maintenance is supported.
  - If there is no label you must select the power off procedure to prevent system damage or data loss.
  - If there is a label you can continue with the power on procedure.
- **No:** you can continue with the power on procedure.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Remove the model 9116-561 or 570 power supply with power on

You might need to remove the power supply with the system power on to replace a failing power supply or as a part of another service action. Use the procedure in this section to accomplish this task.

**Important:** If the system or drawer you are removing the power supply from contains one of the following adapters in slot P1-C6/C7 you must remove the power supply with the power off to prevent system damage or data loss.

- FC 1800 - HSL-2 Ports - 2 Copper
- FC 1801 - HSL-2 Ports - 2 Optical
- FC 1810 - GX Dual-port 4x HCA

**Attention:** Two power supplies must be present in the system to power on the system unit. If one power supply fails, or you have a system failure that does not stop the fans, the system will continue to operate. **You can remove and replace the power supply with the system power on if it is done in less than 5 minutes.** After 5 minutes, the system will power down to prevent the system from overheating. If the system power is off, go to “Replace the model 9116-561 or 570 power supply with power off” on page 63.

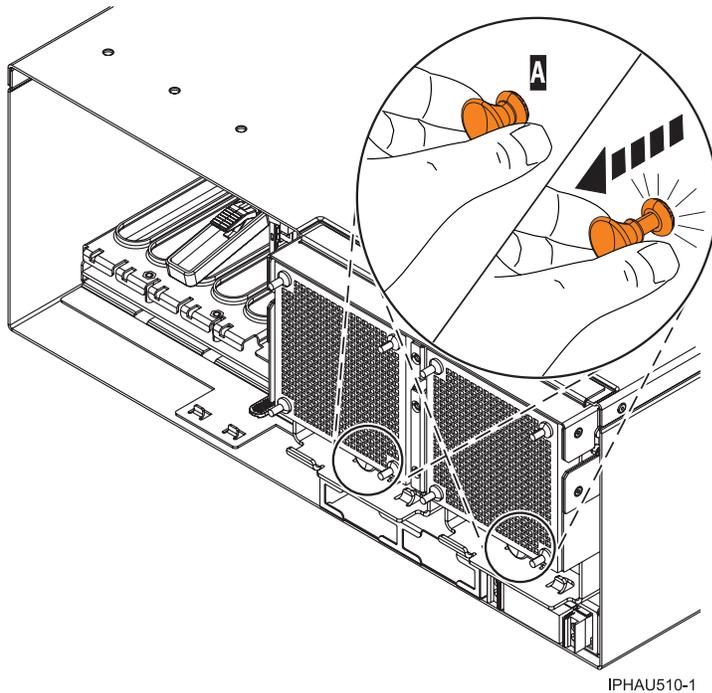
If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see “Remove a part using the Hardware Management Console” on page 117.

To remove the power supply while the system power is on, complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.
3. Identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
4. Disconnect the power cable from the back of the power supply that you want to remove.

**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. As shown in Figure 47 on page 57, pull the terra-cotta locking knob A into the open position.



IPHAU510-1

Figure 47. Power supply unlocked

6. Lift the locking handle **A** (see Figure 48 on page 58) into the open position, and then use the locking handle to pull the power supply out of the system **B**.

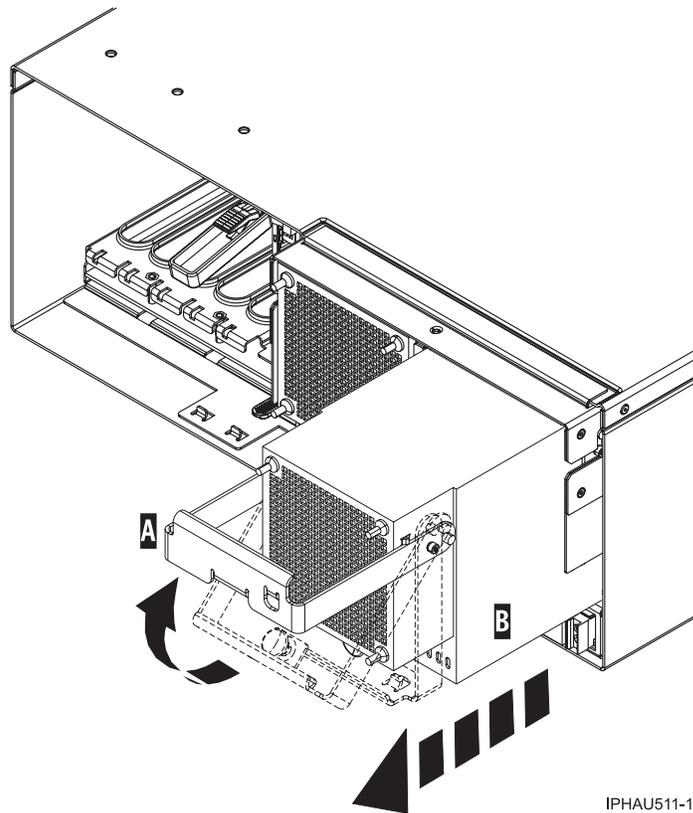


Figure 48. Remove the power supply from a system unit

**Note:** When you remove a power supply with the system power on, an error is logged. No action is required for this error.

## Replace the model 9116-561 or 570 power supply with power on

Learn how to replace the power supply with the system power on.

The following procedure describes the replacement of the power supply while the system power is on.

**Attention:** Two power supplies must be present in the system to power on the system unit. If one power supply fails, or you have a system failure that does not stop the fans, the system will continue to operate. You can remove and replace the power supply with the system power on if it is done in less than 5 minutes. After 5 minutes, the system will power off to prevent the system from overheating. If the system power is off, go to “Replace the model 9116-561 or 570 power supply with power off” on page 63.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a power supply. For instructions, see “Replace a part using the Hardware Management Console” on page 118.

To replace the power supply while the system power is on, complete the following steps:

1. To remove the power supply, see “Remove the model 9116-561 or 570 power supply with power on” on page 56.
2. Perform the prerequisite tasks described in “Before you begin” on page 85.

**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.
3. With the terra-cotta locking knob and the locking handle in the open position, place the new power supply in the power supply bay.
  4. Push the power supply **A** into place.
  5. Close the locking handle **B**, and then push the terra-cotta locking knob **C** into the closed position.

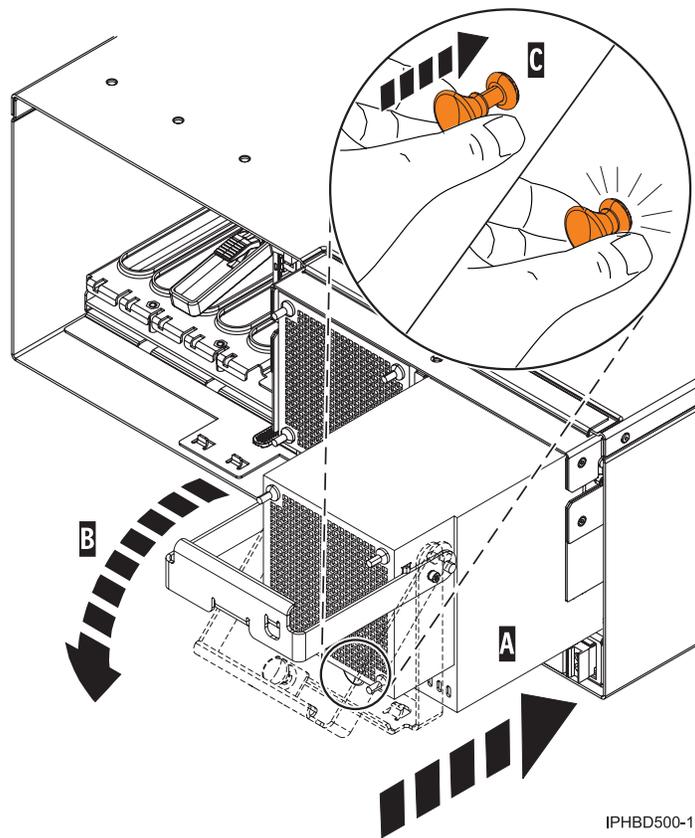
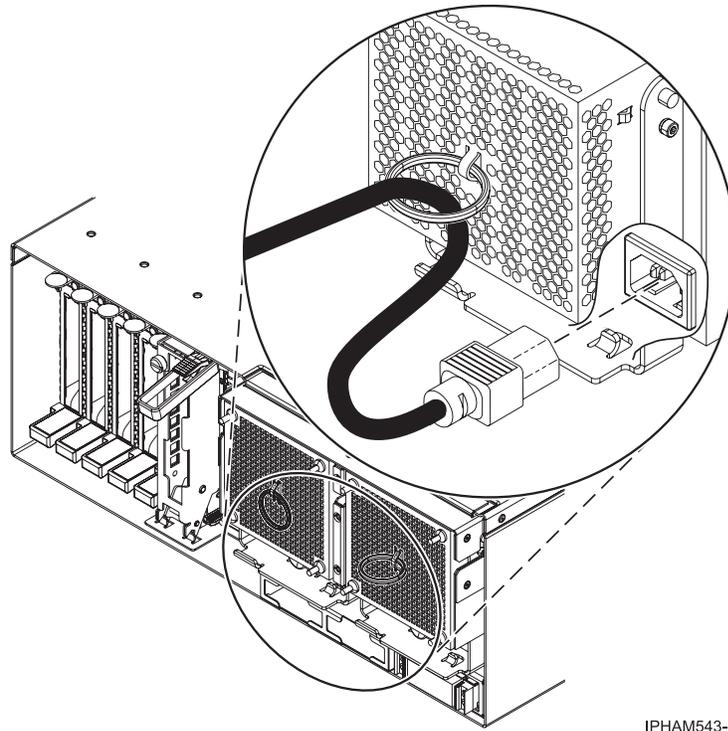


Figure 49. Replace the power supply

6. Reconnect the power cable to the back of the power supply by routing it through the ring, if provided. If your server is equipped with a retention ring, route the power cord through the ring before you plug it into the back of the server.



IPHAM543-1

Figure 50. Cable routed through power supply ring

7. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read “Power supply LEDs” on page 74. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 3 on page 59. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
8. Close the back rack door.

## Remove the model 9116-561 or 570 power supply with power off

If your system is already powered off, or if you need to perform another service task, you might need to remove the power supply with the system power off. Use the procedure in this section to accomplish this task.

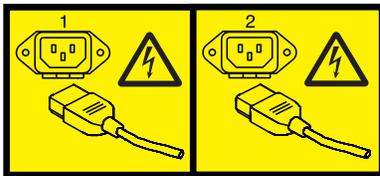
If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing a power supply. For instructions, see “Remove a part using the Hardware Management Console” on page 117.

To remove the power supply while the system power is off, complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. Identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, stop the system. For instructions, see “Stop the system or logical partition” on page 89.
4. Open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**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



6. Pull the locking knobs A into the open position.

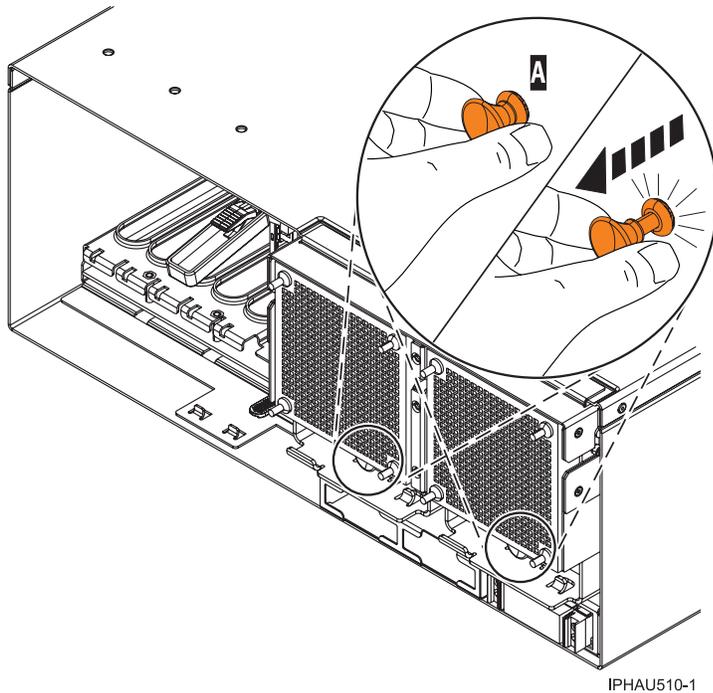


Figure 51. Power supply unlocked

7. Lift the locking handle **A** into the open position, and then use the locking handle to pull the power supply out of the system **B**.

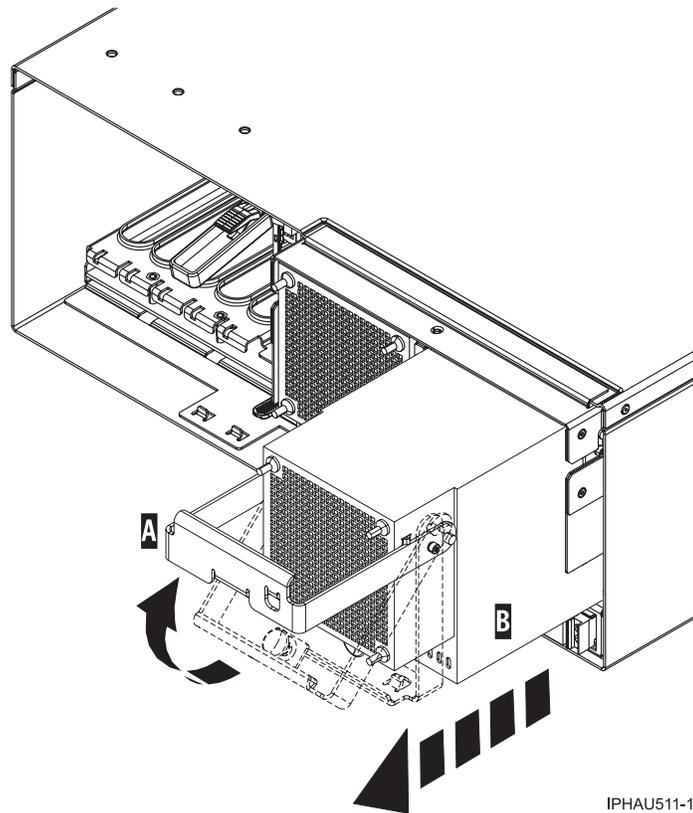


Figure 52. Remove the power supply

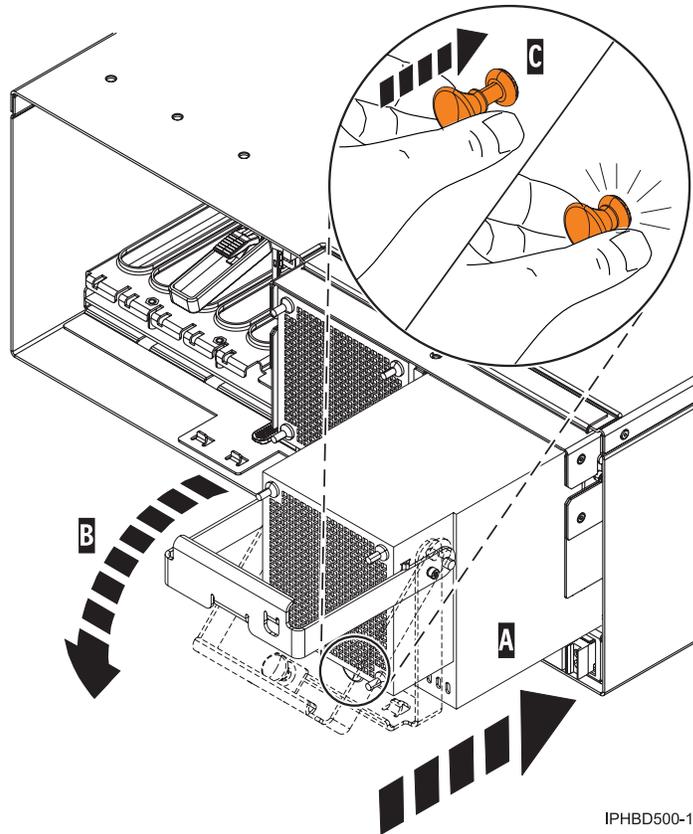
## Replace the model 9116-561 or 570 power supply with power off

Learn how to replace the power supply with the system power off.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing a power supply. For instructions, see “Replace a part using the Hardware Management Console” on page 118.

To replace the power supply while the system power is off, complete the following steps:

1. To remove the power supply, see “Remove the model 9116-561 or 570 power supply with power off” on page 60.
2. With the terra-cotta locking knob and the locking handle in the open position, place the new power supply in the power supply bay.
3. Push the power supply **A** into place.
4. Close the locking handle **B**, and then push the locking knob **C** into the closed position.



IPHBD500-1

Figure 53. Replace a power supply

5. Reconnect the power cable to the back of the power supply by routing it through the ring, if provided.
6. "Start the system or logical partition" on page 87.
7. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, read "Power supply LEDs" on page 74. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 63. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
8. Close the back rack door.

---

## Model 5786, 5787, 7031-D24, or 7031-T24 SCSI disk drive enclosure

Learn how to install, or remove and replace a power supply.

This unit can have up to two power supplies.

### Install or replace a model 5786, 5787, 7031-D24, or 7031-T24 power supply with the power on

Learn how to install a second power supply, or replace one of two power supplies present in the system.

The following procedure describes how to install a power supply or replace a power supply when two power supplies are present in the system unit. The system unit power can remain on under the following conditions:

- You are installing a second power supply.
- One of the two power supplies present in the system must be replaced.

To install a second power supply or to replace a failing power supply when two are present in the system, do the following procedure:

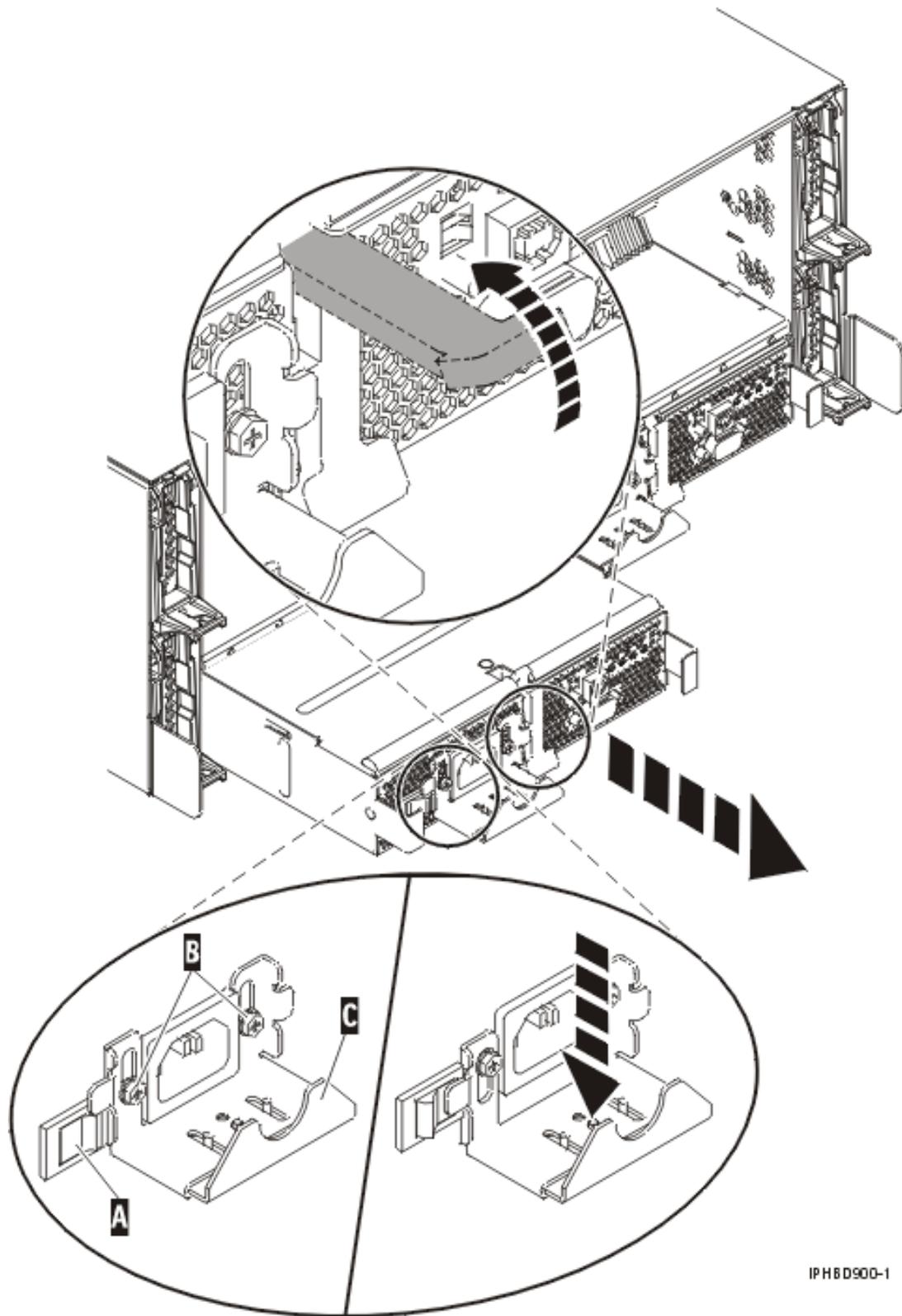
1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. On a rack-mounted system unit, open the back rack door.

**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.
3. If a failing power supply is present, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
  4. Disconnect the power cable from the failing power supply at the back of the system by completing the following steps (see Figure 54 on page 66):
    - a. Press the switch **A** on the left side of the power cable.
    - b. Release the power cable lock by pushing the bracket **C** down.

**Tip:** You might have to slightly loosen the screws **B** with a Phillips screwdriver to lower the bracket.

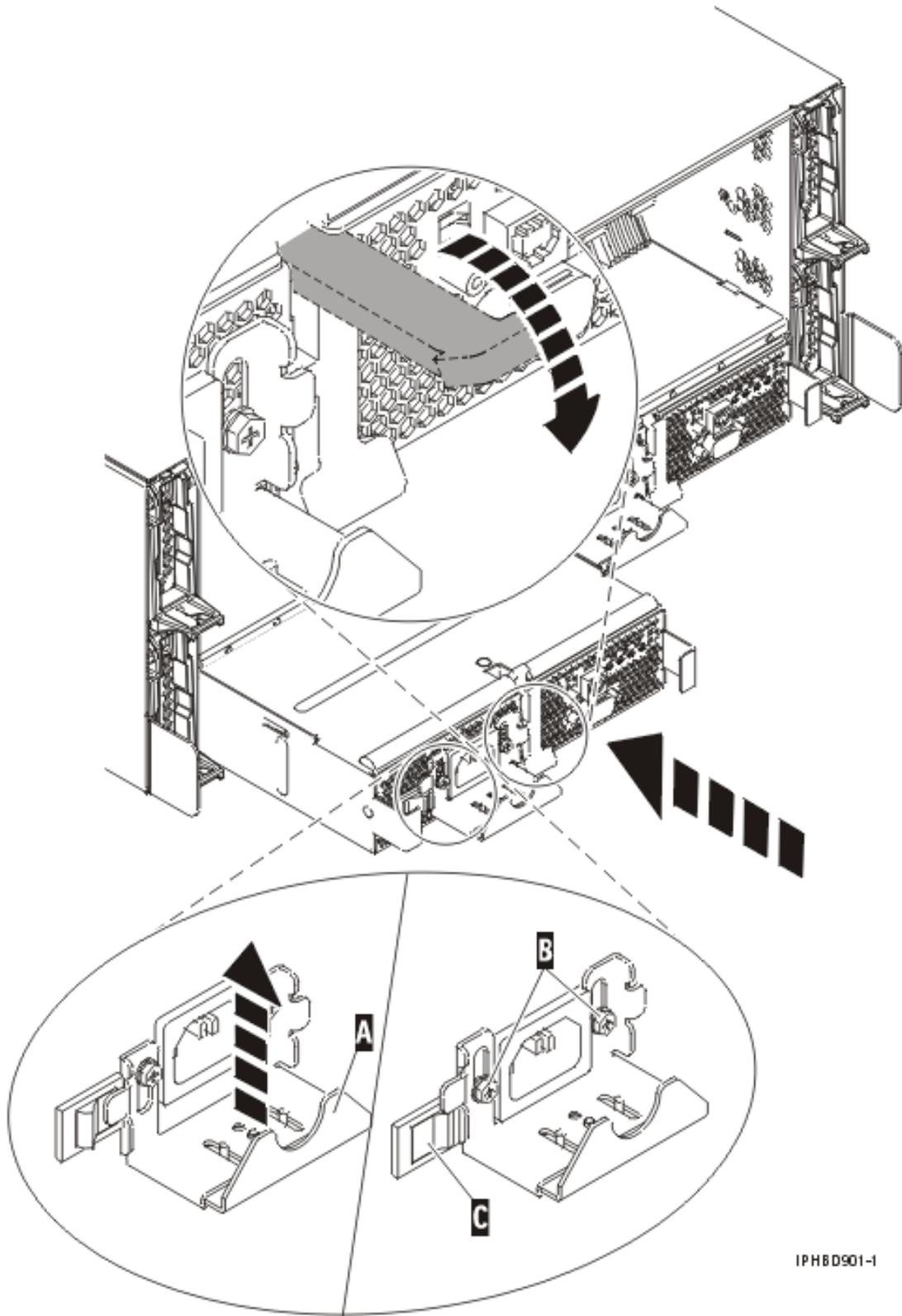
- c. Remove the power cable.
5. Ensure that the power supply bay is empty by completing the following steps:
  - a. Remove the power supply filler by lifting the tab and pulling the filler out of the system.
  - b. Remove a failing power supply by doing the following:
    - 1) Lift the white tab until the power supply is unseated.
    - 2) Grasp the white tab on the power supply and gently pull the power supply out of the system.



IPH8D900-1

Figure 54. Power supply removal

6. As shown in Figure 55 on page 67, insert the new power supply into the empty power supply bay.



IPH8D901-1

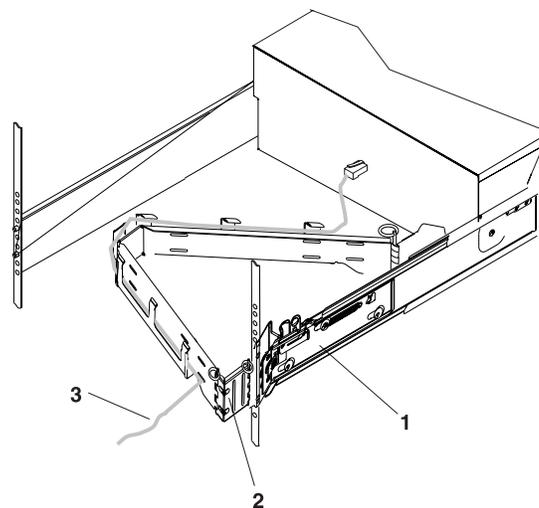
Figure 55. Power supply installation

7. Slowly press the power supply into the system.
8. Press the white latch toward the power supply.

9. If you are installing a second power supply feature, plug the second power cable into the back of the new power supply.
10. Lift up the cable bracket **A** and press the power switch **C** to lock the cable bracket into place.
11. Connect the power source to the system. If you have just replaced a power supply, reconnect the power cable to the new power supply by routing it through the ring if provided.
12. Note the state of the light-emitting diodes (LEDs) on the power supply. If the LEDs indicate that the power supply is operating normally, that is, both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 6 on page 66. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

**Note:** The power supply has four light-emitting diodes (LEDs): two green LEDs (ac power good and dc power good), and two amber LEDs (the far right LED indicates the power supply status). If both of the green LEDs are on solid (not blinking) and the right amber LED is off, the power supply is operating correctly. If the ac power good LED is on, the dc power good LED is blinking, and the far right amber LED is off, then the system is turned off, but the power supply is still connected to the power source. If the far right amber LED is blinking, the power supply is not operating correctly or the identify function has been selected.

13. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



- 1 System rail
- 2 Cable management arm
- 3 Cable

IPHAH615-0

Figure 56. Cables routed through the cable-management arm

14. Reconnect the cables at the back of the system.
15. On a rack-mounted system unit, close the back rack door.

## Remove and replace the model 5786, 5787, 7031-D24, or 7031-T24 SCSI disk drive enclosure power supply with power off

Learn how to remove and replace the primary or only power supply present in the system.

The following procedures describe the removal and replacement of the power supply while the power is off. This system can have up to two power supplies. A power supply is removed and replaced while the system power is off under the following conditions:

- The primary power supply has failed and a secondary power supply is not present in the system.
- The power supply must be removed from the system to repair another part of the system.

### Remove the model 5786, 5787, 7031-D24, or 7031-T24 power supply

Learn how to correctly remove a power supply with the system power off.

To remove a power supply while the system power is off, complete the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. If you are removing the power supply as part of another procedure, continue to the next step. If you are removing the power supply because it is not operational, identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If the system is running, “Stop the system or logical partition” on page 89.
4. On a rack-mounted system unit, open the back rack door.

#### Attention:

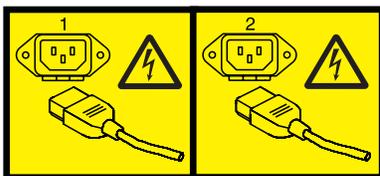
- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric 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. Disconnect the power cable from the back of the power supply that you want to remove by doing the following steps (see Figure 57 on page 71):
    - a. Press the power switch **C** on the left side of the power cable.
    - b. Release the power cable lock **A** by pushing it down.

**Tip:** You might have to slightly loosen the retaining screws **B** with a Phillips screwdriver to lower the cable lock.

- c. Remove the power cable.

**Note:** This system is equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

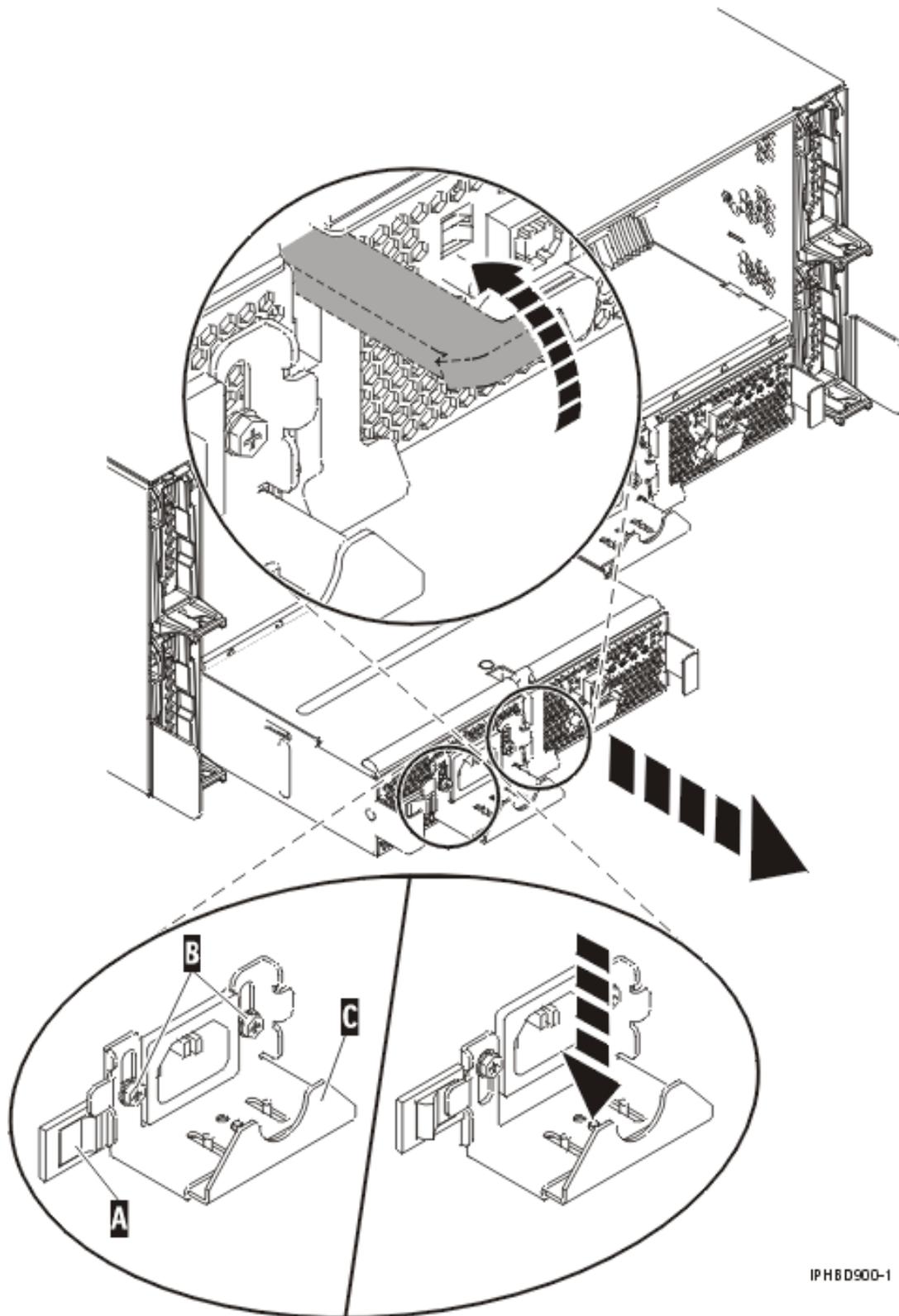
(L003)



or



6. Wait at least 10 seconds before performing the next step.
7. As shown in Figure 57 on page 71, lift the white tab until the power supply is unseated.



IPH8D900-1

Figure 57. Power supply removal

8. After the power supply is released, use the power supply handle to gently pull the power supply out of the system.

## Replace the model 5786, 5787, 7031-D24, or 7031-T24 power supply

Learn how to correctly replace a power supply with the system power off.

### Notes:

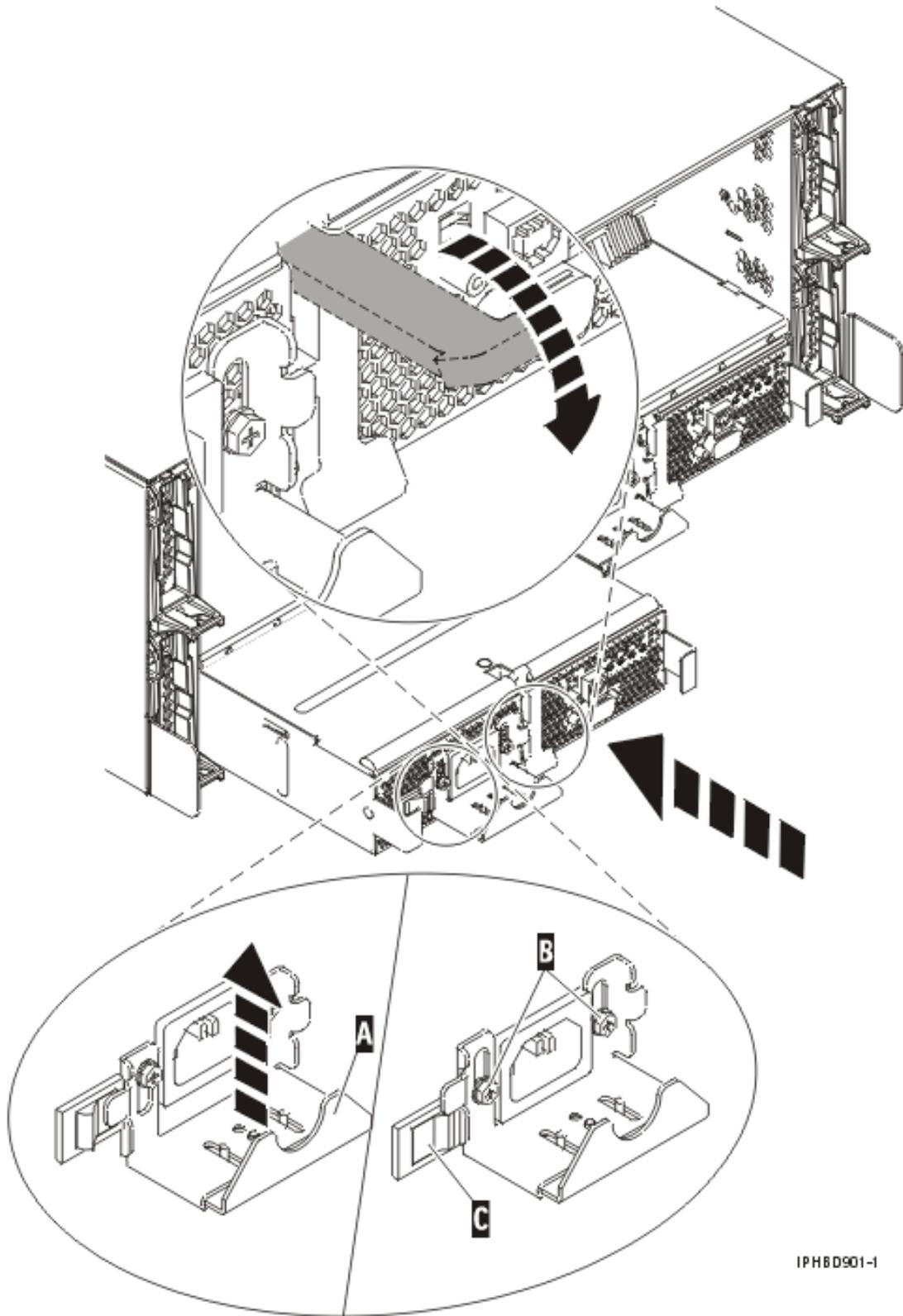
1. Do not connect the power cables to the power source until you are instructed to do so.
2. During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

To replace a power supply, complete the following steps:

1. If you have not previously removed the power supply, do so now. For instructions, see “Remove the model 5786, 5787, 7031-D24, or 7031-T24 power supply” on page 69.

### Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
  - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
  - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. As shown in Figure 58 on page 73, insert the new power supply into the empty power supply bay.



IPH8D901-1

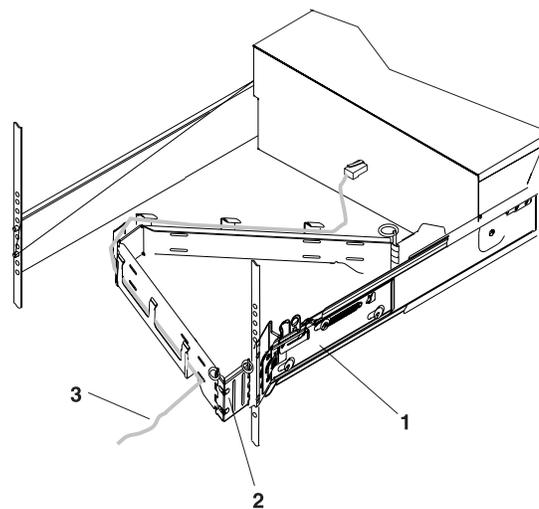
Figure 58. Power supply installation

3. Slowly press the power supply into the system.
4. Press the white latch toward the power supply.

5. Reconnect the power cable at the back of the power supply through the ring, if provided.
6. Lift up the cable bracket **A** and press the power switch **C** to lock the cable bracket into place.
7. Note the state of the light-emitting diodes (LEDs) on the power supply. If the LEDs indicate that the power supply is operating normally, that is, both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 72. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

**Note:** The power supply has four light-emitting diodes (LEDs): two green LEDs (ac power good and dc power good), and two amber LEDs (the far right LED indicates the power supply status). If both of the green LEDs are on solid (not blinking) and the right amber LED is off, the power supply is operating correctly. If the ac power good LED is on, the dc power good LED is blinking, and the far right amber LED is off, then the system is turned off, but the power supply is still connected to the power source. If the far right amber LED is blinking, the power supply is not operating correctly or the identify function has been selected.

8. If you are working on a rack-mounted system unit, ensure that the system cables are routed correctly through the cable-management arm.



- 1 System rail
- 2 Cable management arm
- 3 Cable

IPHAH615-0

Figure 59. Cables routed through the cable-management arm

9. Reconnect the cables at the back of the system.
10. On a rack-mounted system unit, close the back rack door.
11. If the system was stopped, start the system. For instructions, see “Start the system or logical partition” on page 87.

## Power supply LEDs

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

The power supply has three light-emitting diodes (LEDs) which indicate the power supply status: two green LEDs (ac power good and dc power good), and one amber LED.

To locate the power supply LEDs look on the top or back of an exposed power supply. You might have to remove covers or panels to expose the power supply. Follow the instructions to remove covers or panels for the power supply you are working with, then return here.

To activate the identify function see, “Identify a failing part” on page 118

- If both of the green LEDs are on solid (not blinking) and the amber LED is off, the power supply is operating correctly.
- If the ac power good LED is on, the dc power good LED is blinking, and the amber LED is off, then the system is turned off, but the power supply is still connected to the power source.
- If the amber LED is blinking, the power supply is not operating correctly or the identify function has been selected.

---

## Power supply for the 0595, 5095, or 7311-D20 expansion unit

Learn how to remove and replace a power supply in an expansion unit.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Remove the power supply from the 0595, 5095, or 7311-D20 expansion unit

Learn how to remove a power supply.

To perform this procedure for the while the system power is on, you must have two power supplies and four working fans.

The figures in these instructions might not look exactly like the system unit that you have. However, the steps to perform this procedure are the same.

To remove the power supply, do the following procedure:

1. Perform the prerequisite tasks described in “Before you begin” on page 85.
2. Identify the power supply that needs to be replaced. For instructions, see “Identify a failing part” on page 118.
3. If you have two power supplies in the expansion unit, go to step 4. If you have one power supply in the expansion unit, go to “Stop the system or logical partition” on page 89.
4. Remove the back cover. For instructions, see “Remove the back door and cover from the 5095 expansion unit” on page 111.

### 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. Remove the left-side cover (viewed from the back).
  6. Pull the handle on the power supply that is to be replaced as shown in the following figure.

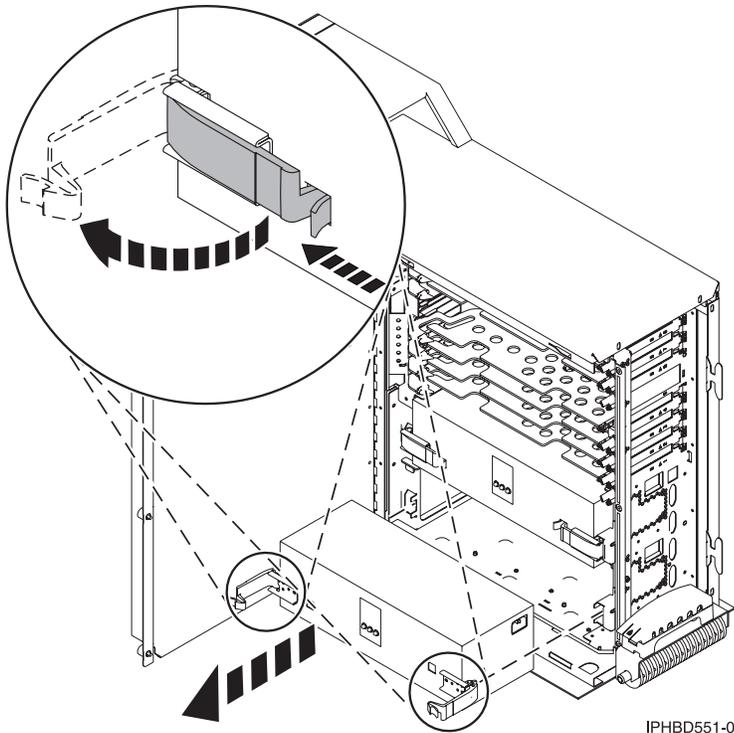


Figure 60. Power supply removal

7. Support the bottom of the power supply as you slide it out of the unit.

## Replace the power supply in the 0595, 5095, or 7311-D20 expansion unit

Learn how to replace a power supply in an expansion unit.

To replace the power supply, complete the following steps:

The figures in these instructions might not look exactly like the expansion unit that you have. However, the steps to perform the task are the same.

1. To remove the power supply, see “Remove the power supply from the 0595, 5095, or 7311-D20 expansion unit” on page 75.
2. Slide the power supply into the expansion unit as shown.

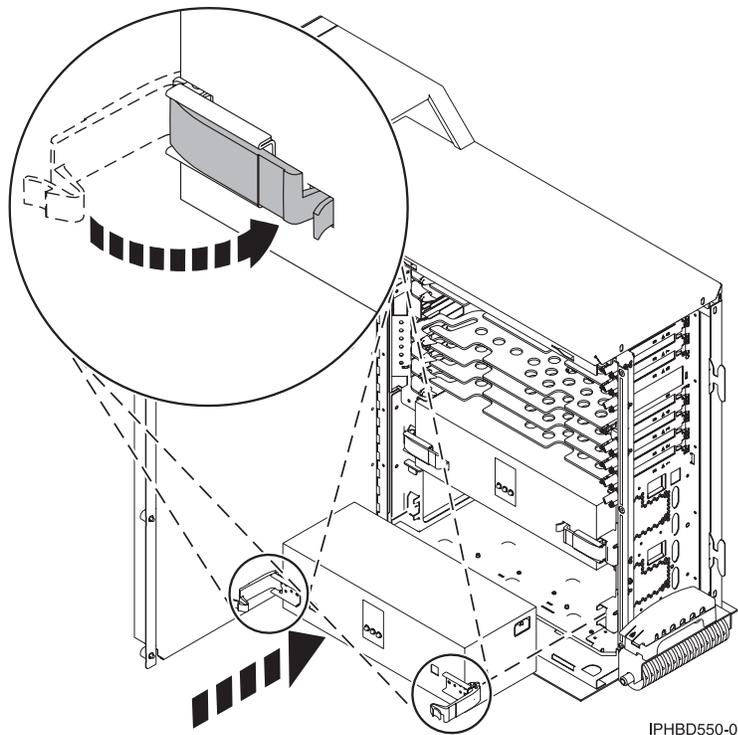


Figure 61. Power supply installation

3. Move the handles toward the power supply to lock it in place.
4. Look in the center of the power supply. A green light on the power supply indicates that the power is on and the installation is successful. If the green light is not on remove the power supply and repeat this procedure.
5. Install the side cover.
6. Plug the power cord into the power supply and into the outlet.
7. Install the back cover.
8. If the system was stopped, “Start the system or logical partition” on page 87.

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## Dual-line cord for the 5094, 5294, 8093-002, or 8094-002 expansion unit

View information for installing a dual-line cord.

The installation of these features are customer tasks. When you use these instructions, you will perform some or all of the following tasks:

- Power off the system unit.
- Open the back cover.
- Replace or install your new hardware.
- Perform an initial program load (IPL) of your operating system.
- Verify your new hardware configuration.

You might need to allow additional time to complete your jobs and back up your system.

You can choose to perform these tasks yourself or contact a service provider to make arrangements to perform the tasks for a fee. If you encounter difficulties when performing a task, contact your service provider.

Some of the figures in these instructions may not look exactly like the expansion unit that you have. However, the steps to perform the task are the same.

## Install a dual-line cord in a 5094, 5294, 8093-002, or 8094-002 expansion unit

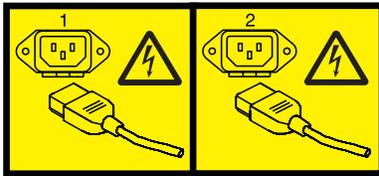
Learn how to install a dual-line cord.

To use the dual-line cord feature in an expansion unit, you need to install a power supply and connect jumpers.

1. Perform prerequisite tasks as described in “Before you begin” on page 85.
2. “Stop the system or logical partition” on page 89.

**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



3. Remove the back cover. For instructions, see “Remove the back door from the 5074, 5079, and 5094 expansion unit” on page 109.

**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.
4. Determine whether a power supply is already installed in location **A** as shown?

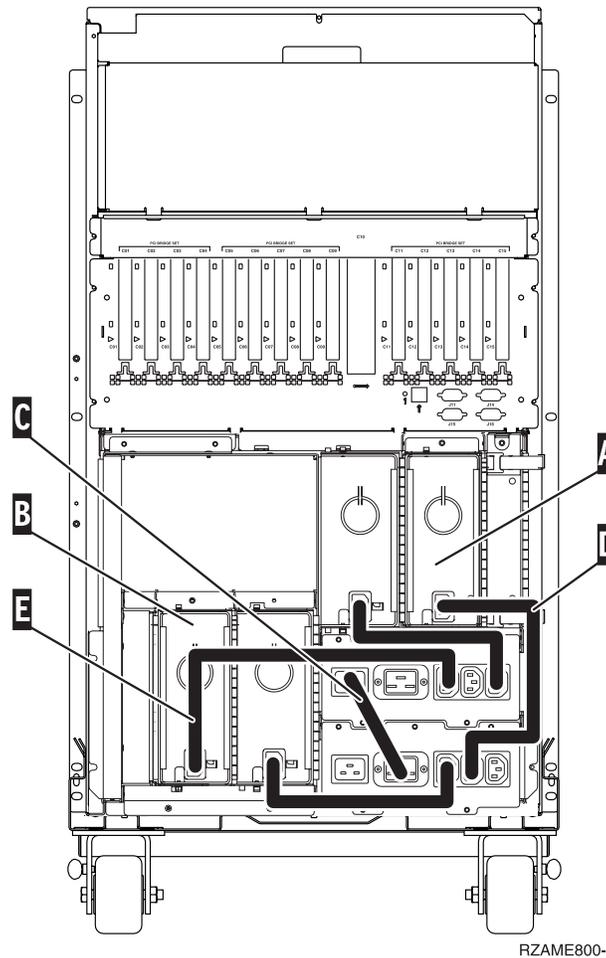


Figure 62. Dual-line cord installation

If No: The new power supply will be installed in **A**. Continue with the next step.

If Yes: The new power supply will be installed in **B**. Continue with the next step.

5. Remove the jumper **C**.
6. Remove the plate where you will install the power supply (**A** or **B**).
7. Slide the power supply into the system unit.
8. Move the handles toward the power supply to lock it in place.
9. If you installed the power supply in **A**, connect jumper **D** (part number 04N2181).
10. If you installed the power supply in **B**, connect jumper **E** (part number 04N2181).
11. Plug in the power cords.

12. Plug in the system unit and system unit console. Plug in all the components that you previously unplugged, such as printers and monitors.
13. Power on all attached devices, such as printers and displays.
14. Install the back cover.
15. Power on the workstation or PC that is the console for your system.
16. “Start the system or logical partition” on page 87.
17. Verify the new resource is functional. Refer to “Verify the installed part” on page 122.

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## Line cord maintenance

You might need to determine the power redundancy status of your system. You can locate instructions in this section to check each line cord in a system to help determine the redundancy status of the system as a whole.

These instructions will help meet requirements for line cord maintenance in 19-inch and 24-inch systems with redundant power supply configurations.

### Related References

“Power supply LEDs” on page 74

Learn about the different states of the power supply LEDs and how they can be used to identify or verify a power supply you are servicing.

## Line cord maintenance for 19-inch racks

Learn how to check the status of each line cord in a system to ensure the system power or redundant power status is functional. Use the instructions in this section to accomplish these tasks.

This procedure is intended for use with stand-alone or rack-mounted systems that have redundant power supply configurations.

**Note:** Single line cord systems are not covered in this procedure because they do not have redundant power and they require the system to be shut down to perform line cord maintenance.

### Preparation:

During line cord maintenance, power-related error reference codes will be generated on one or more systems, depending on your location configuration. Coordinate this activity with the Support Center to prevent them from dispatching service and so they know when they should consider error conditions valid again. For the systems that are managed by the Hardware Management Console (HMC), disable call home before starting and re-enabled at the end of the procedure.

During this procedure, you will be told to clear or ignore errors associated with the procedure. You may choose to document the errors as they occur in the process rather than potentially clear the entire error log. This is a personal preference item and does not affect the intent of the test, as long as intentionally uncleared errors are tracked relative to new test errors or valid error messages that may need attention.

**Note:** Power, rack, or internal rack system line cord maintenance can be performed on one power circuit or line cord at a time without shutting the system down because redundant power supplies hot-pluggable. This is true providing the building to system line power source is not the same for both line cords for the rack or system line cord that maintenance is to be performed on.

Using the HMC Service Focal Point for managed systems or the operating system error logging for non-managed, non-HMC systems:

1. Ensure that there are no outstanding power (1100xxxx) error conditions on the system.

2. Make sure that any power-related problems that might be found have been serviced before attempting line cord maintenance.

## 19-inch line cord maintenance for stand-alone systems

Learn how to perform line cord maintenance for stand-alone systems.

1. With the system powered on and running, after the error logs have been checked and any power-related problems resolved: Check to ensure the line cords are securely plugged into the system power supplies and wall receptacles.

**Note:** For confirmation that the system is operating with redundant power, check the three power supply status LEDs on each power supply. For models 51x and OpenPower 710, the power supply LEDs can be viewed on the back of the system.

For models 52x, 55x, OpenPower 720, or IntelliStation POWER 285, the LEDs are located on the top of each power supply. To view these power supply LEDs, remove the top cover of the system to view LED status, see "Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720" on page 101.

2. If both green power supply LEDs are solid (not blinking) and the amber LED is off, continue with this procedure. If not, have your system serviced before continuing with line cord maintenance.
3. Remove power from one of the power supplies by turning off the power source or by unplugging the line cord from the power supply.
4. Perform line cord maintenance on that line cord or the line connection.
5. When maintenance is complete, plug the line cord back into the power supply. Reconnect the line cord to the power source and, if turned off, reapply power to the system line cord that was just tested.

After the power supply has had power reapplied to it, both green LEDs will return to solid and the amber LED will be off.

6. Using the operating system error logging for systems that are not managed by a Hardware Management Console systems:

**Note:** Removing line voltage from the system power supply will cause the system to generate a 11001510 or 11001520 reference code, depending on which power supply you are working with.

- a. Clear or ignore the associated power error (11001510 or 11001520) caused by this procedure.
  - b. Wait approximately 5 minutes and recheck the error log before continuing. If additional reference codes are displayed after the power supply 11001510 or 11001520 reference code was cleared or ignored, or if the power supply LEDs did not return to normal state in the previous step, have your system serviced before continuing.
7. Repeat steps 1 through 5 for the second power supply line cord or power source.
  8. After completing line cord maintenance on the second line cord or power source, return the system to the normal operating state, see "Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720" on page 104.
  9. If you contacted the support contact at the beginning of this procedure, notify them that your system is back in production.

## 19-inch line cord maintenance for rack-mounted systems

Learn how to perform line cord maintenance on a rack, system, or drawer in a rack.

**Important:** To perform line cord maintenance on a rack, system, or drawer within the rack, the rack must be externally cabled to power in a redundant power source configuration. Within the rack, all systems and drawers must be configured to support redundant power requirements with one side of the individual system or drawer cabled to the power distribution panel on one side of the rack, and the other side of the system or drawer cabled to the power distribution panel on the other side of the rack. Ensure

that this is true before beginning your line cord maintenance. If this power cord separation is not present, then your rack, system, or drawer is not configured to be redundant.

### 19-inch line cord maintenance for systems and drawers in a rack:

Learn how to perform the line cord maintenance for systems and drawers in a rack.

1. After the error logs have been checked, any power-related problems have been resolved, and with the system powered on and running: Make sure that the line cords are securely plugged into the system power supplies and rack power distribution panels, ensuring proper separation of line cords to power distribution panels.

**Note:** For confirmation that the system is operating with redundant power, check the three power supply status LEDs on each power supply. For models 570, 510, OpenPower 710, 7311-D10, 7311-D11, and 5790 I/O drawers, the power supply LEDs can be viewed from the back of the system.

For system models 520, 55x, OpenPower 720, or 7311-D20 and 0595 I/O drawers, the power supply LEDs are located on the top of each power supply. To view these power supply LEDs, remove the top cover of the system to view the LED status, see “Place the rack-mounted system or expansion unit in the service position” on page 95 and “Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 101.

**Important:** When placing a system or drawer in the service position, avoid accidentally unplugging cables from the system being worked with, as well as other systems or drawers in the rack.

2. If both green power supply LEDs are solid (not blinking) and the amber LED is off, continue with this procedure. If not, have your system serviced before continuing with line cord maintenance.
3. Remove power from one of the power supplies by unplugging the line cord from the power supply.
4. Perform the line cord maintenance on that line cord or line connection.
5. When maintenance is complete, plug the line cord back into the power supply, reinstall the line cord into the rack power distribution panel. After the power supply has had power reapplied to it, both green LEDs will return to solid (not blinking) and the amber LED is off.
6. Using the Hardware Management Console (HMC) Service Focal Point for managed systems, or the operating system error logging for non-managed, systems that are not managed by a HMC that may be in the same rack:

**Note:** Removing line voltage from the system or drawer power supply will cause the system to generate a 11001510 or 11001520 reference code, depending on which power supply you were working with.

- a. Clear or ignore the associated power (11001510 or 11001520) error caused by this procedure.
  - b. Wait approximately 5 minutes and recheck the error log before continuing. If additional reference codes are displayed after the power supply 11001510 or 11001520 reference code was cleared or ignored, or if the power supply LEDs did not return to normal state in the previous step, have your system serviced before continuing.
7. Repeat steps 1 through 5 for the second power supply or drawer line cord. For the model 570 system, continue this process until all units have been tested.
  8. If you need to perform the rack line cord maintenance procedure, continue to “19-inch line cord maintenance for the rack.” Otherwise, return all systems and drawers to their normal operating condition, see “Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720” on page 104 and “Place the rack-mounted system or expansion unit in the operating position” on page 99.
  9. If you contacted the Support contact at the beginning of this procedure, notify them that you system is back in production.

### 19-inch line cord maintenance for the rack:

You might need to perform line cord maintenance on the rack cords after checking the cords on the system inside the rack. Use the procedure in this section to accomplish this task.

If you have performed the line cord maintenance procedures for line cords inside the rack, continue with this procedure. If you have not, then you need to perform the internal line cord process on each system and drawer before continuing with this procedure, see “19-inch line cord maintenance for systems and drawers in a rack” on page 82.

**Note:** The rack line cord maintenance step removes power from one side of all systems and drawers in a rack at the same time. One side of the rack can be powered off at a time. The same 11001510 or 11001520 reference codes will be generated for all systems and drawers in the rack and will need to be cleared or ignored after each side of the rack power is reapplied, as done in the rack internal cable step. For this reason, a very recent check of system power redundancy is important to ensure redundancy is in place when the rack power is disconnected.

If your rack is equipped with two switches, one for each power distribution panel inside the rack, then it is possible to turn off one switch and perform line cord maintenance for that rack power cable. If your rack is not configured to do so, then disconnecting the power cable at the back of one side of the rack or building receptacle is the alternate method.

1. Turn off one of your rack switches, or disconnect the rack line cord at the back of the rack.
2. Perform line cord maintenance on that external line cord or power source.
3. Reinstall the line cord and restore the power source. If your rack has an external switch that you turned off at the beginning of this procedure, turn the switch back on.
4. After approximately 10 minutes, check and clear or make note of each system’s error log installed in the rack. If the rack is managed by a Hardware Management Console (HMC), non-system drawer errors will be displayed under Service Focal Point for the controlling system. If the rack, or part of the rack, is not managed by an HMC, then the drawer errors might be displayed in the controlling system error log.
5. Perform steps 1 through 4 for any additional rack power cables.
6. Inspect the rack and system power cables to ensure they are securely plugged.
7. Close or secure any covers, doors, or shields that were previously removed.
8. If you contacted the Support Contact at the beginning of this procedure, notify them that your system is back in production.

## Line cord maintenance for 24-inch racks

You might need to perform ac facility power maintenance on 24-inch systems with separately fed ac inputs. Use the procedure in this section to accomplish this task.

This procedure is not for ac line cord replacement.

**Important:** If your system is a model 575 configured with a Bulk Power Jumper (BPJ), your system rack is not configured to be redundant. Do not attempt this procedure.

1. Select **Service Applications** on the Hardware Management Console (HMC) graphical user interface (GUI).
2. Select **Service Focal Point** → **Exchange Parts**.
3. Select **System Unit Bulk Power Assembly** for the machine of the bulk power controller (BPC) to have line cord maintenance.
4. From the **Selected** menu, click **Replace FRU...**
5. Select **Bulk Power Controller (BPC)**. Click **Next**.
6. Select the BPC location code BPC-Aside (P1-C4). Click **Add** → **Commit**.

**Attention:** Do not go through R&V screens past LED verification. Select **No, one or more of the indicators are not on. Delay repair.** Do not click **Cancel.** This will cause the BPA service lock to be set.

One of two screens will appear.

- The FRU can be exchanged redundantly when:

A screen is displayed asking you to verify the BPC LEDs on the opposite side. If the LEDs are on as indicated, the FRU can be replaced redundantly. In either case, select **No, one or more of the indicators are not on** → **Next.** On the next screen, select **Delay the repair** → **Next.** Continue with step 7 and check the redundancy of the other side.

- The FRU cannot be exchanged redundantly when:

You are not asked to inspect the LEDs. You are only told that the redundant hardware is not available. You are asked to inspect the LEDs, but the visual inspection shows that redundant hardware is not available. Select **Delay repair** → **Next.**

**Remember:** The ac facility maintenance should not be done until full redundancy is restored.

7. Repeat the redundancy check using steps 1 on page 83 through 8 with BPC-Bside (Location code: P2-C4).
8. Perform ac facility maintenance on one side only. When BPC ac is reapplied, it will boot and go online.
9. Enter `Issysconn - r all`. Check service processors and BPCs (A & B side) until all show **Connected**.
10. Repeat the redundancy check on both sides using steps 1 on page 83 - 9.
11. Perform ac facility maintenance on the other side.
12. Perform line cord checks again to confirm that there was no loss of redundancy introduced by the procedure (steps 1 - 8).
13. Clear any error codes that might have resulted from this procedure.

---

## Related procedures

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

## Before you begin

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

### DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

### DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

Before you begin a replacement or installation procedure, perform these tasks:

1. If you are installing a new feature, ensure that you have the software required to support the new feature and determine if there are any existing PTF prerequisites.

To do this, go to the following Web site: [http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf)

2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).

For information on backing up your system or logical partition, select from the following:

- AIX® backup
- i5/OS® backup

- Linux<sup>®</sup> backup
3. Review the installation or replacement procedure for the feature or part.
  4. Note the significance of color on your system.  
Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.
  5. Ensure that you have access to a medium, flat-blade screwdriver.
  6. If parts are incorrect, missing, or visibly damaged, do the following:
    - If you are replacing a part, contact your service provider or next level of support.
    - If you are installing a feature, contact one of the following:
      - Your service provider or next level of support.
      - In the United States, contact the IBM Rochester Manufacturing Automated Information Line (R-MAIL) at 1-800-300-8751.

In countries outside of the United States, use the following Web site to locate your service and support telephone numbers:  
<http://www.ibm.com/planetwide>
  7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, or your next level of support.
  8. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning, and then return to these instructions.

## Start or stop the system or logical partition

Learn how to start or stop a system or logical partition.

### Start the system or logical partition

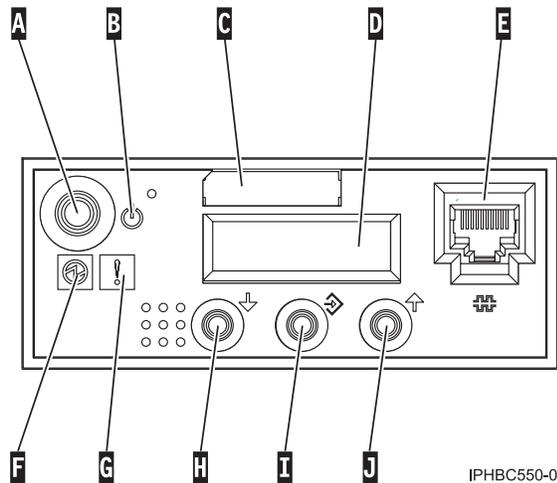
You might need to start a system or logical partition. You can use this procedure to start the system or logical partition.

#### Start a system that is not managed by a Hardware Management Console:

You can use the power button or the Advanced System Management Interface to start a system that is not managed by a Hardware Management Console.

To start a system that is not managed by a Hardware Management Console (HMC), follow these steps:

1. On a rack-mounted system unit, open the front rack door, if necessary. On a stand-alone system unit, open the front door.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:
  - All system power cables are connected to a power source.
  - The power-on light **F**, as shown in the following figure, is slowly blinking.
  - The top of the display **D**, as shown in the following figure, shows 01 V=F.



**Tip:** The system attention light **G**, as shown in the previous figure, does not appear on the control panel on the model 570.

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

**Note:** On the OpenPower 710 or model 9110-510, the power button is on the operations panel.

4. Observe the following after pressing the power button:
  - The power-on light begins to blink faster.
  - The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
  - Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

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

- Set up access to the ASMI. For instructions, see [Accessing the ASMI](#).
- Start the system using the ASMI. For instructions, see [Powering the system on and off](#).

### Start the system or logical partition using the Hardware Management Console:

You can use the Hardware Management Console (HMC) user interface to start the system or logical partition after the required cables are installed and the power cables are connected to a power source.

For instructions on working with the HMC, see [Managing the Hardware Management Console](#). For instructions on starting a logical partition, see [Activating a partition profile](#). For instructions on starting the system, see [Powering on the managed system](#).

Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

## Stop the system or logical partition

Learn how to stop a system or logical partition.

**Attention:** Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in the data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

To stop the system or logical partition, select the appropriate procedure:

### Stop the system that is not managed by a Hardware Management Console:

You might need to stop the system to perform another task. Use these instructions to stop the system using the power button or Advanced System Management Interface.

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

After you stop the operating system, or if you need to use the control panel power button to power off the system see, Using the control panel power button to power off.

### Prepare to stop the system

Before you stop the system, do the following:

1. If an Integrated xSeries® Adapter (IXA) is present on the system, shut it down using i5/OS options.
2. Ensure that all jobs are completed and end all applications.
3. Ensure that the operating system is stopped. Failure to do so can result in the loss of data.
4. Record the IPL type and IPL mode from the control panel display to help you return the system to this state when the installation or replacement procedure is completed.
5. Write down the information displayed on the control panel if you are stopping your system due to an error or to make a repair. For more information, see Collecting reference codes and system information.

### Stop the system

To stop a system, follow these steps:

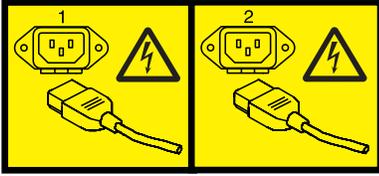
1. Log in to the system as a user with the authority to run the shutdown or pwrdownsys (Power Down System) command.
2. At the command line, enter one of the following commands:
  - If your system is running AIX, type **shutdown**.
  - If your system is running i5/OS, type **pwrdownsys \*immed**.
  -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

The command stops the operating system. The system power turns off, the power-on light begins to slowly blink, and the system goes into a standby state.

3. Set the power switches of any devices connected to the system to off.
4. Unplug any power cables that are attached to the unit from electrical outlets. Ensure that you unplug power cables from peripheral devices, such as printers and expansion units.

**Important:** The system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

(L003)



or



**Stop the system or logical partition using the Hardware Management Console:**

You can use the Hardware Management Console (HMC) user interface to stop the system or a logical partition. For instructions on stopping the system, see [Powering off the managed system](#), or you can also find instructions at

## **Remove and replace model 7047-185 or 7037-A50 covers and doors**

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

### **Remove and replace the model 7047-185 or 7037-A50 front cover**

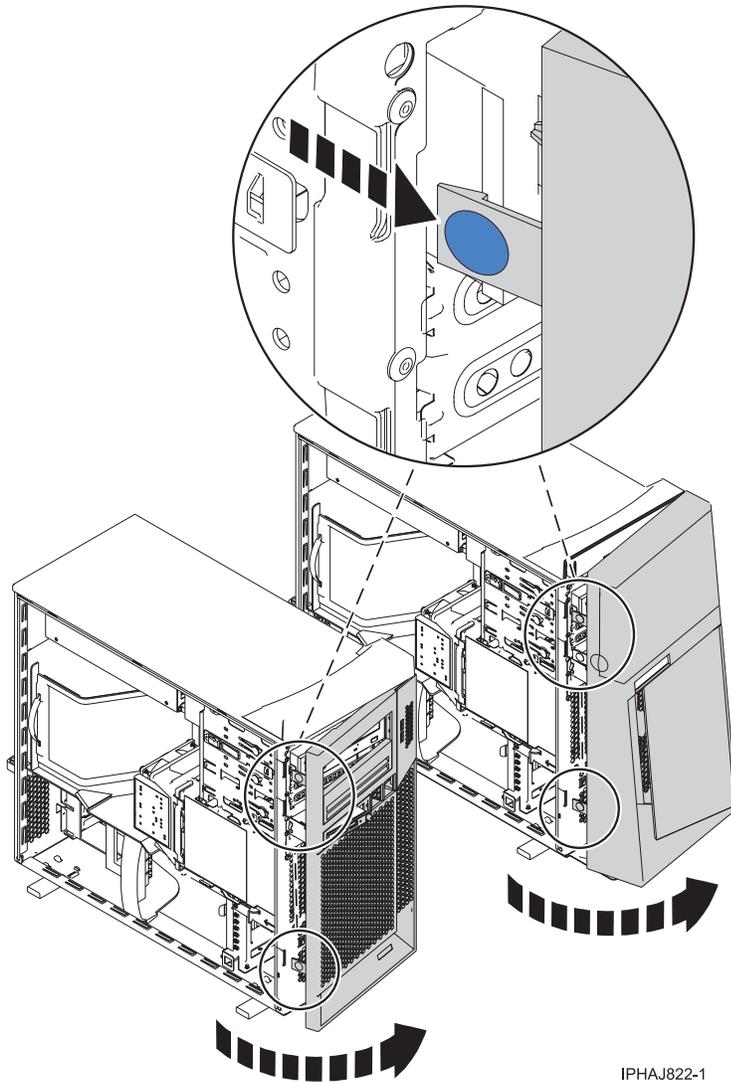
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the front cover follow these steps:

1. Remove the side cover. See, “Remove and replace the model 7047-185 or 7037-A50 side cover” on page 93
2. Lift each of the tabs on the front cover until it is released from the system unit, as shown in the following figure.

**Tip:** On the open face cover there are two tabs to release. On the acoustic feature front cover there are three tabs to release.

3. Pull the cover open until it can be removed from the system unit.



IPHAJ822-1

Figure 63. Removing the front cover

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

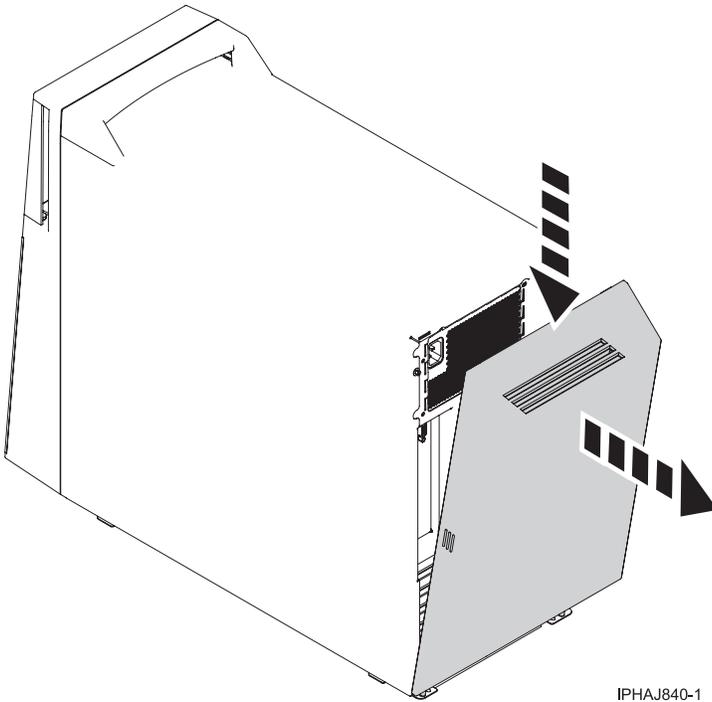
You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

To remove the back cover follow these steps:

1. Press down on the center tab of the cover until you unseat it from the back of the system unit, as shown in the following figure.

**Remember:** Use care not to dislodge any of the cables or cords attached to the system unit during this procedure.

2. Lift the top of the cover until the pins on the bottom clear the holes and the cover can be removed.



IPHAJ840-1

*Figure 64. Removing the back cover*

To replace the back cover follow these steps:

1. Attach all cables and cords.
2. Place the pins on the bottom of the cover into the slot at the bottom of the system unit, as shown in the following figure.
3. Rotate the cover until it snaps into place on the back of the system unit.

**Remember:** Use care not to dislodge any of the cables or cords attached to the system unit during this procedure.

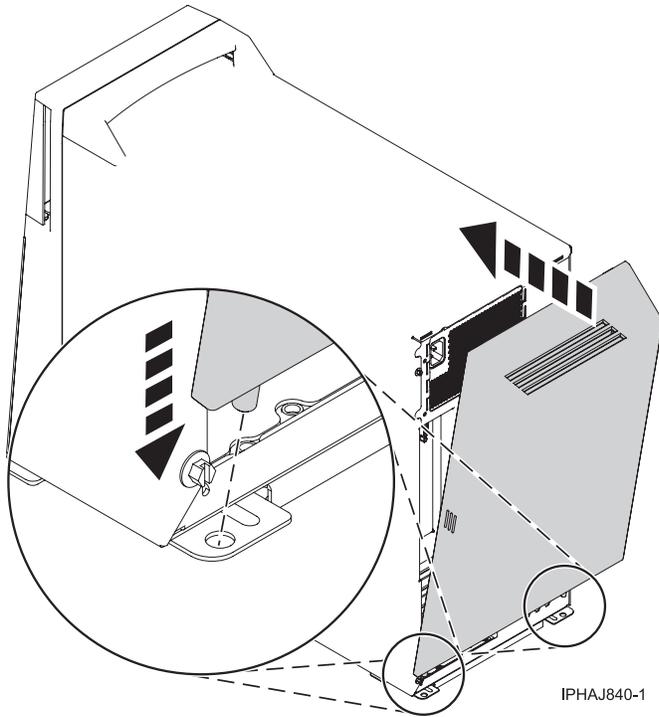


Figure 65. Replacing the back cover

### Remove and replace the model 7047-185 or 7037-A50 side cover

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

To remove the side cover follow these steps:

1. Unlock the security lock **A** if it is locked, as shown in the following figure.
2. Press down on the latch **B** to open the cover and pull it away from the system unit.
3. Lift the panel out of the ledge on the bottom of the system unit.

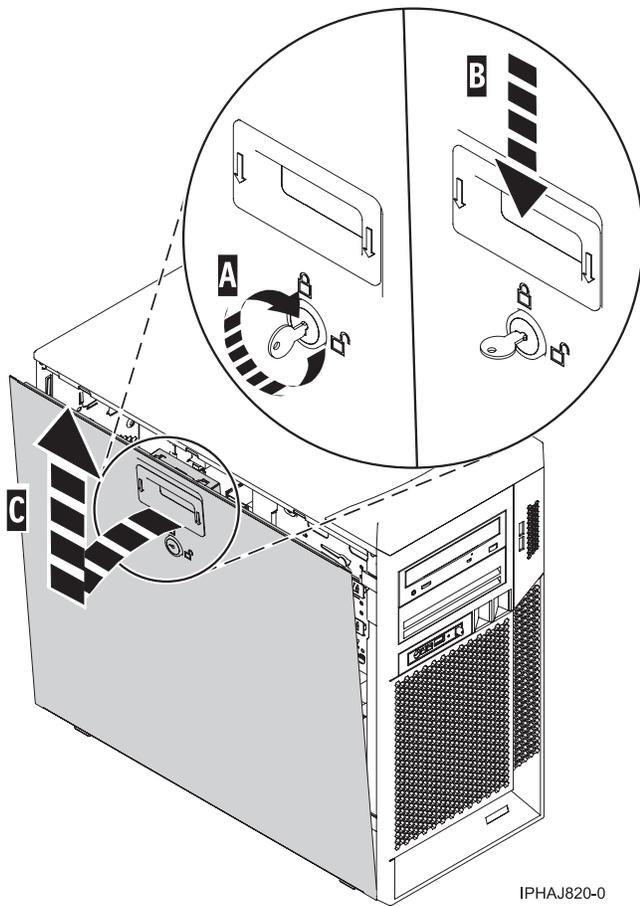


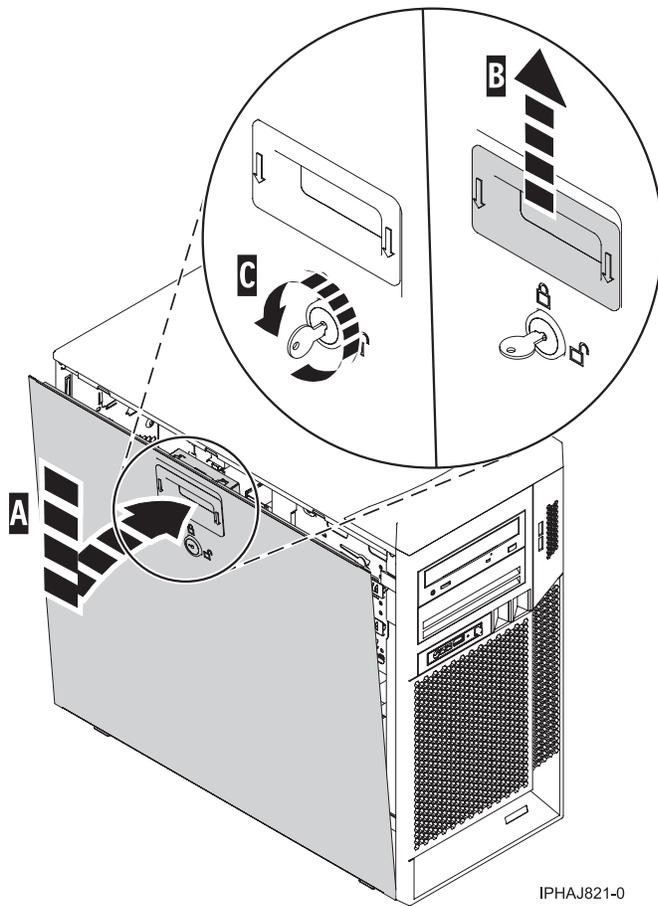
Figure 66. Removing the side cover

**Replace the side cover in a model 7047-185 or 7037-A50:**

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

To replace the side cover follow these steps:

1. Insert the bottom lip of the cover into the ledge on the bottom of the system unit.
2. Rotate the panel up **A** until the latch snaps into place **B**, as shown in the following figure.



IPHAJ821-0

Figure 67. Replacing the service panel

3. Lock the security lock C if needed.

### Place the rack-mounted system or expansion unit in the service position or operating position

You might need to place a system or expansion unit into the service position or operating position to perform service or gain access to internal components. Use the instructions in this section to perform these tasks.

#### Place the rack-mounted system or expansion unit in the service position

You might need to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position. Use the procedure in this section to accomplish this task.

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

## DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

## DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

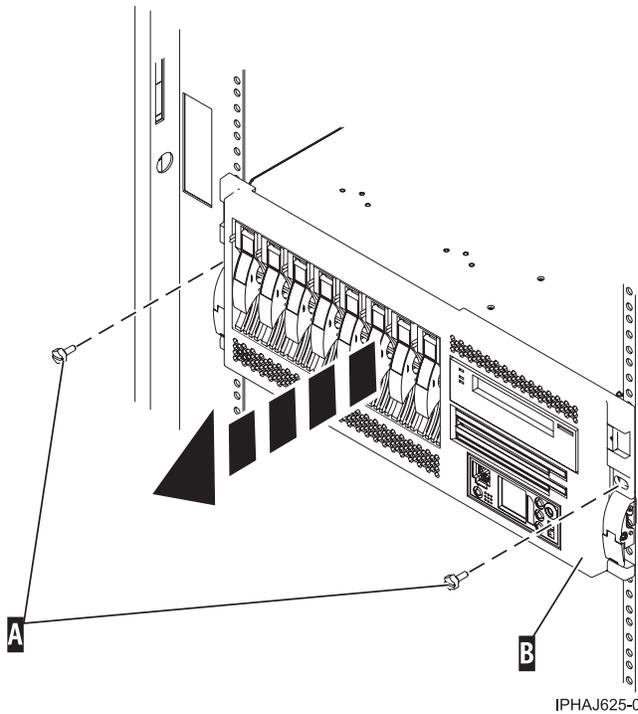
#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

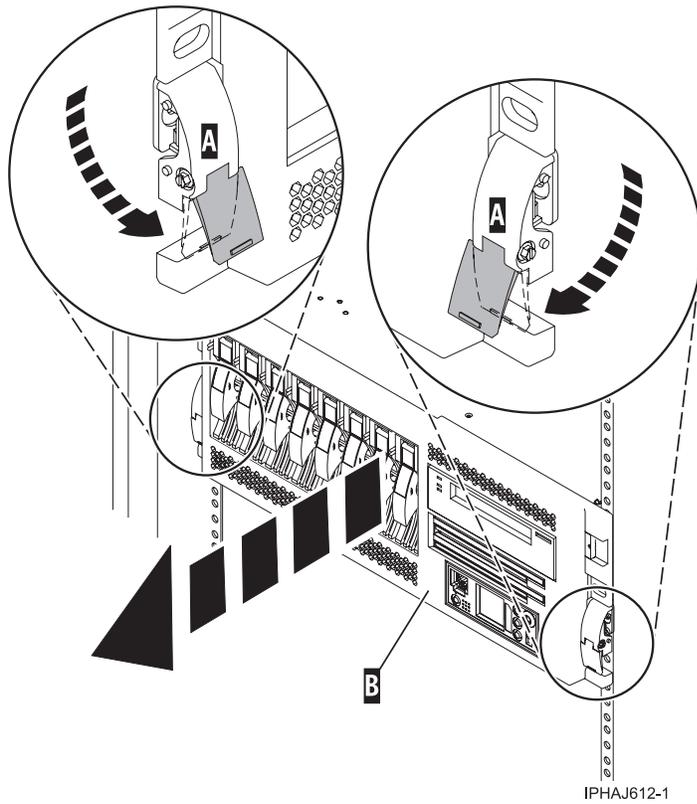
(R001)

To place the rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews **A** that secure the system or expansion unit **B** to the rack as shown in the following figure.



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



4. Review the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

**Note:**

- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

### Place the rack-mounted system or expansion unit in the operating position

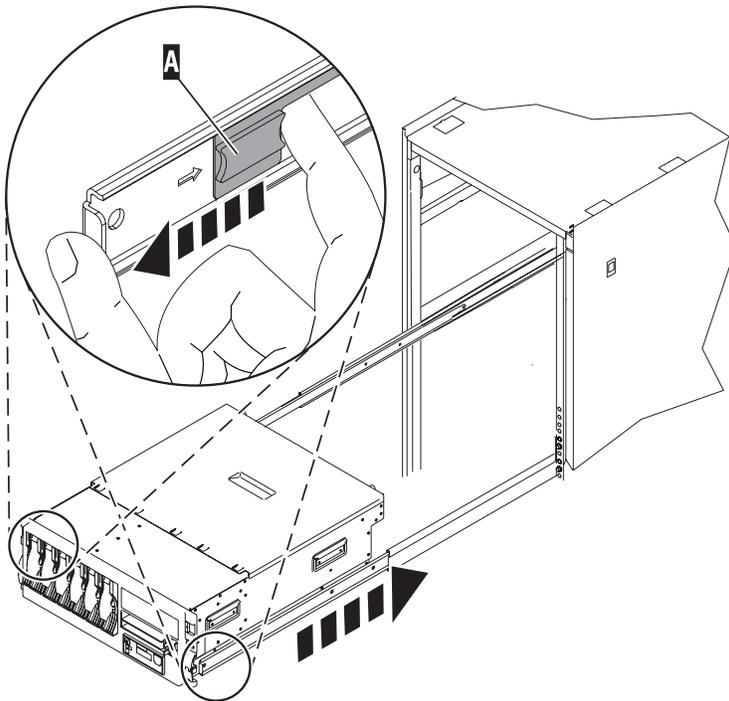
You might need to place the rack-mounted system or expansion unit in the operating position to make the unit available for use. Use the instructions in this section to accomplish this task.

**Tip:** Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system or expansion unit into the operating position, follow these steps:

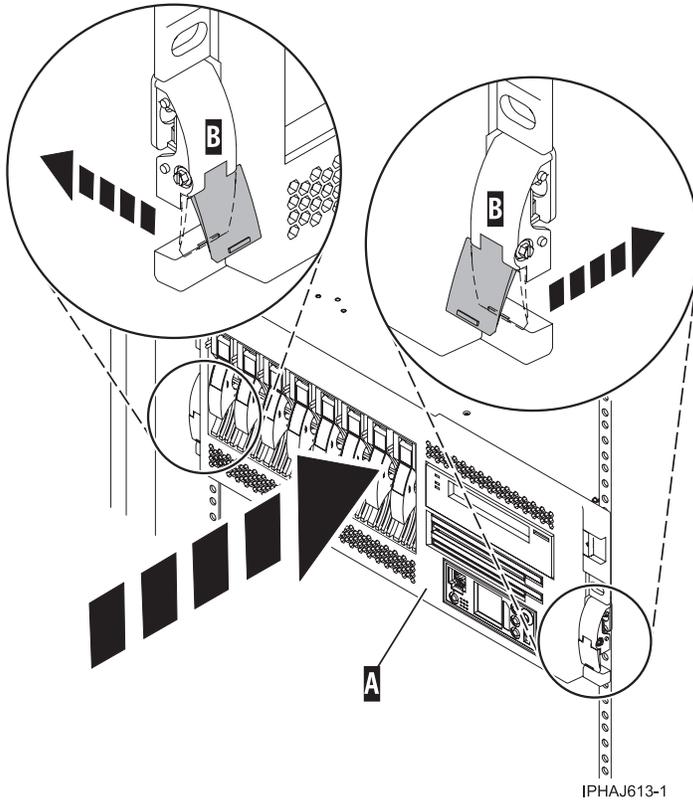
1. Simultaneously release the blue rail safety latches **A**, located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

**Note:** Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.

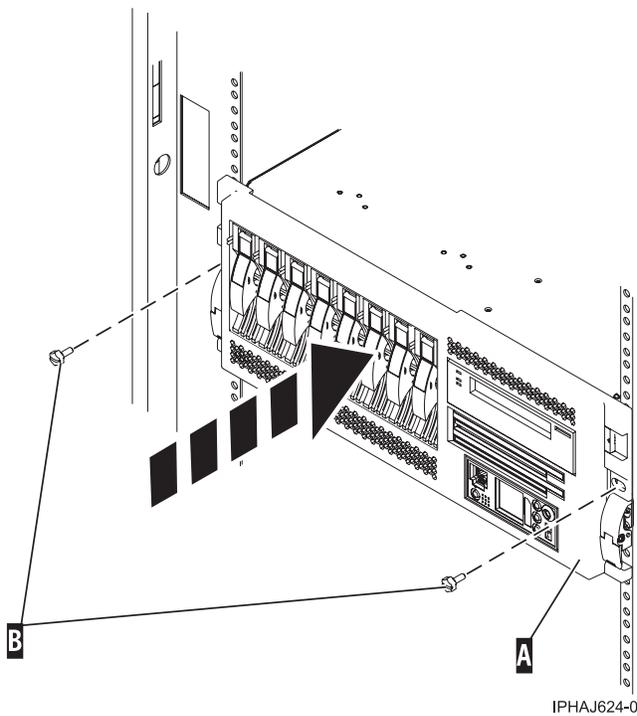


IPHBF509-1

- a. Both rack latches **B** should lock into position as shown in the following figure.



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



3. Close the front rack door.

## **Model 285, 51x, 52x, 55x, 710, or OpenPower 720 service access cover**

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

### **Remove the service access cover from the model 285, 51x, 52x, 55x, 710, or OpenPower 720**

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

**Tip:** Some of the figures in these procedures may not look exactly like the system unit that you have. However, the steps to perform the task are the same.

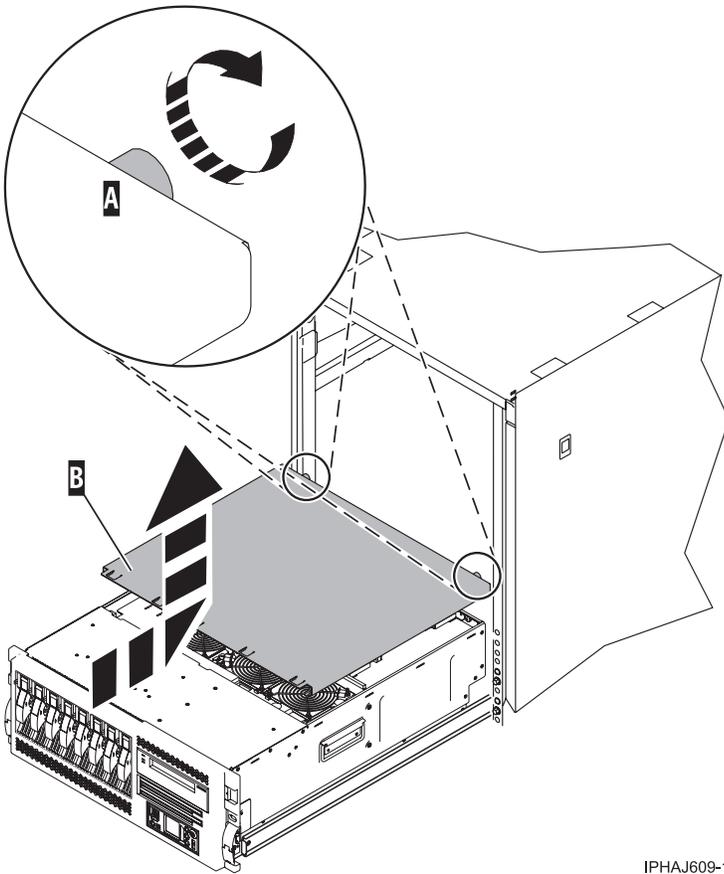
### **Remove the service access cover from the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:**

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

To remove the service access cover from a rack-mounted model follow these steps:

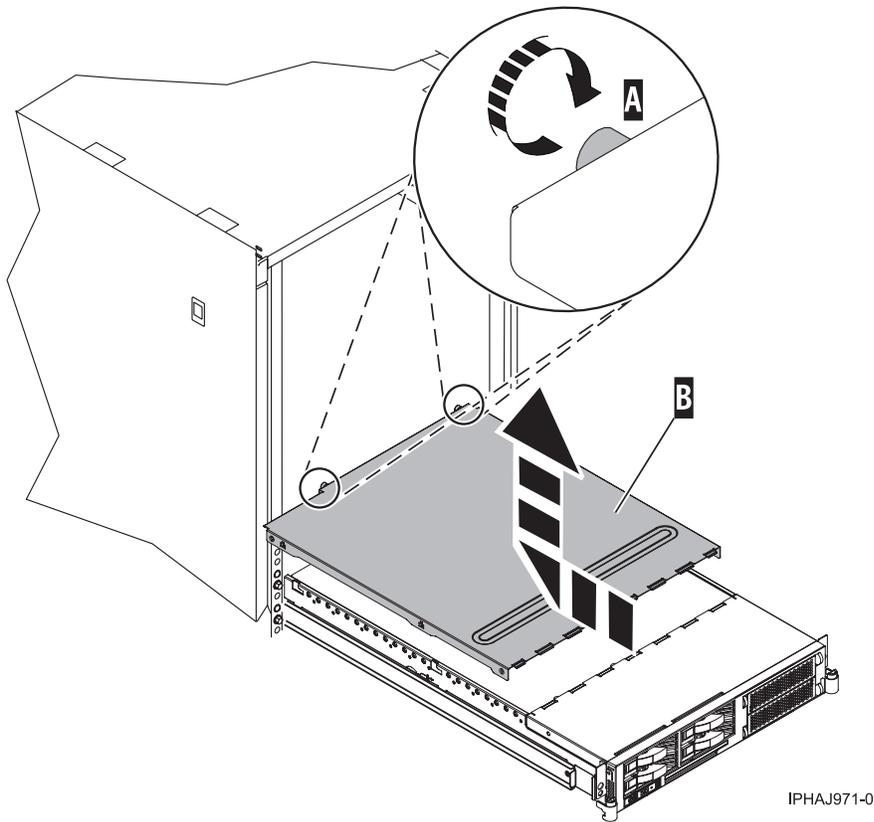
1. "Place the rack-mounted system or expansion unit in the service position" on page 95.
2. Loosen the two thumbscrews located at the back of the cover.
3. Slide the cover toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

**Attention:** For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.



IPHAJ609-1

Figure 68. Remove the service access cover



IPHAJ971-0

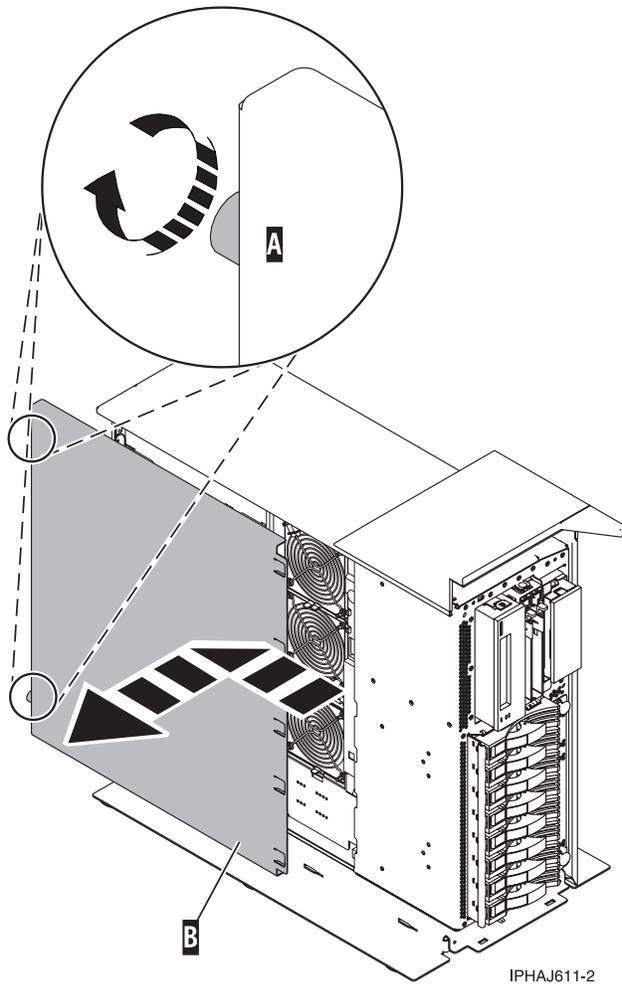
Figure 69. Remove the service access cover

**Remove the service access cover from the stand-alone model 285, 52x, 55x, or OpenPower 720:**

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

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

1. Loosen the two thumbscrews located at the back of the service access cover as shown in the following figure.



2. Slide the service access cover toward the back of the system unit. When the front of the cover clears the front frame ledge, lift the cover off the system unit.

**Attention:** For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.

### **Install the service access cover on the model 285, 51x, 52x, 55x, 710, or OpenPower 720**

You might need to install the service access cover after performing service or accessing internal components. Use the instructions in this section to accomplish this task for your model.

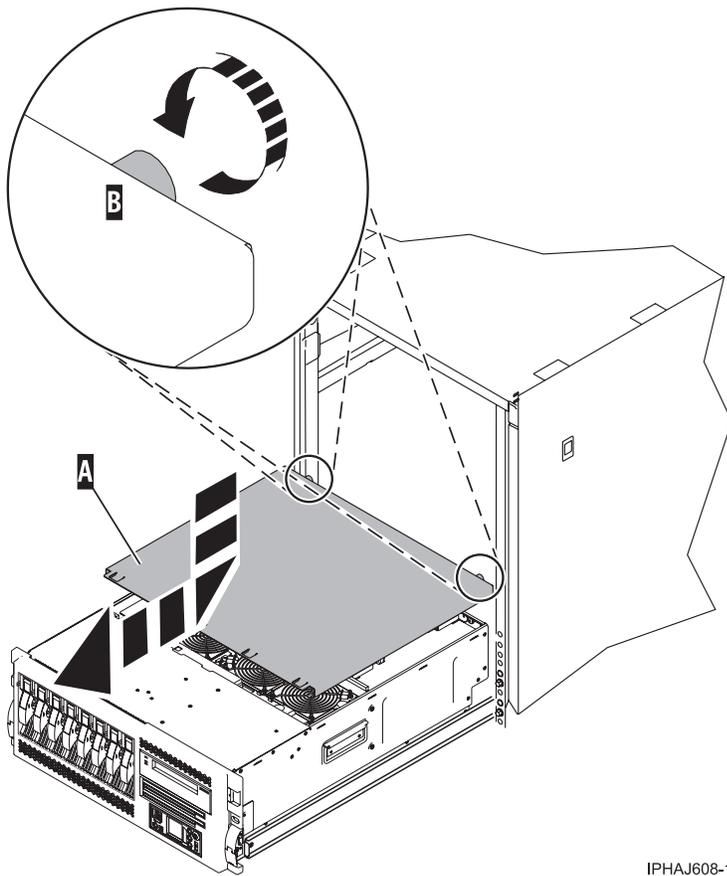
#### **Install the service access cover on the rack-mounted model 51x, 52x, 55x, 710, or OpenPower 720:**

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

To install the service access cover on a rack-mounted model refer to Figure 70 on page 105 and Figure 71 on page 106, and follow these steps:

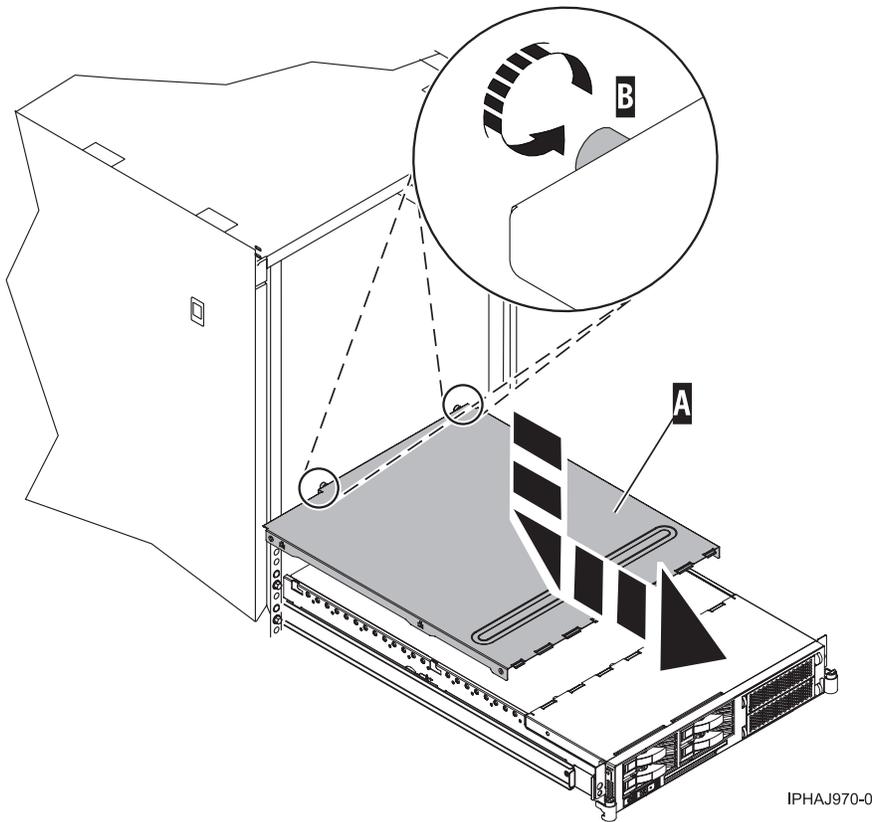
1. Place the service access cover **A** on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
2. Hold the service access cover against the system unit, and slide it toward the front of the system. Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward. The tabs on the service access cover slide beneath the upper chassis ledge, and the two thumbscrews align with the screw holes at the back of the system unit.

3. Tighten the thumbscrews **B** located at the back of the cover.



IPHAJ608-1

Figure 70. Install the service access cover on the rack-mounted model



IPHAJ970-0

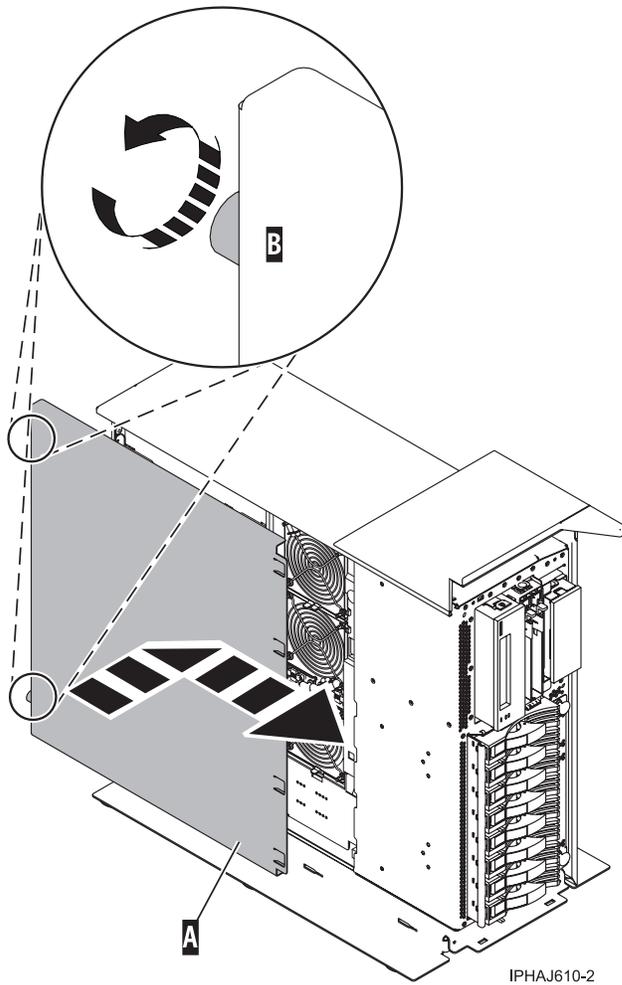
Figure 71. Install the service access cover on the rack-mounted model

**Install the service access cover on the stand-alone model 285, 52x, 55x, or OpenPower 720:**

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

To install the service access cover on a stand-alone model follow these steps:

1. Align the service access cover pins with the slots in the system. The flanges on the top and bottom of the cover wrap around the system frame, as shown in the following figure.
2. Hold the service access cover against the system unit **A** and slide it toward the front of the system.
3. Tighten the two thumbscrews **B** located at the back of the cover.



## Expansion unit cover or door

You might need to remove, replace, or install covers or doors on an expansion unit as a part of accessing components or servicing your unit. This section includes instructions to accomplish these tasks.

### Remove the front door from the 5074 or 5094 expansion unit

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

To remove the front door from the expansion unit, follow these steps:

1. Open the front door **A** as shown in the following figure.
2. Press the latch **B** to remove the door.

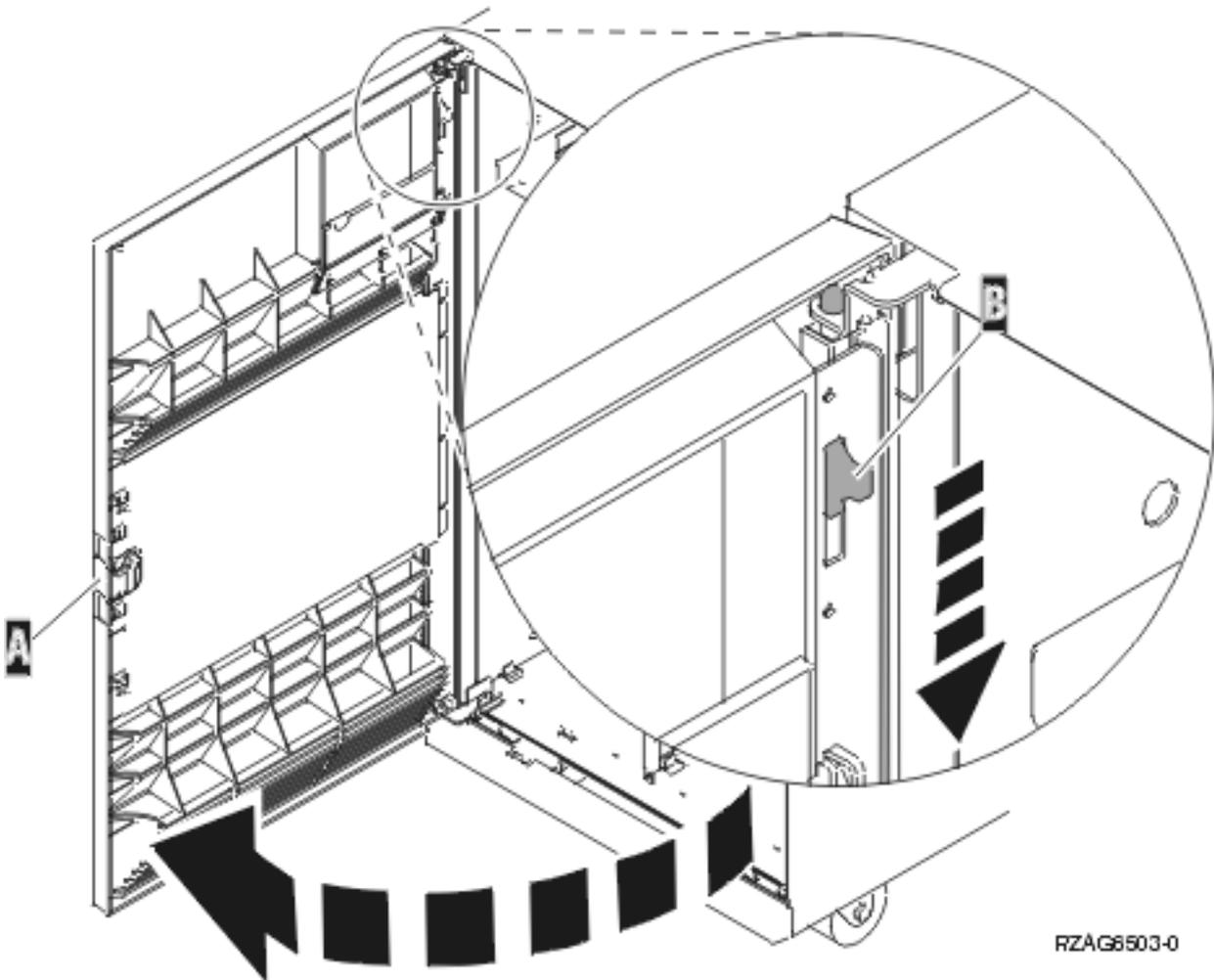


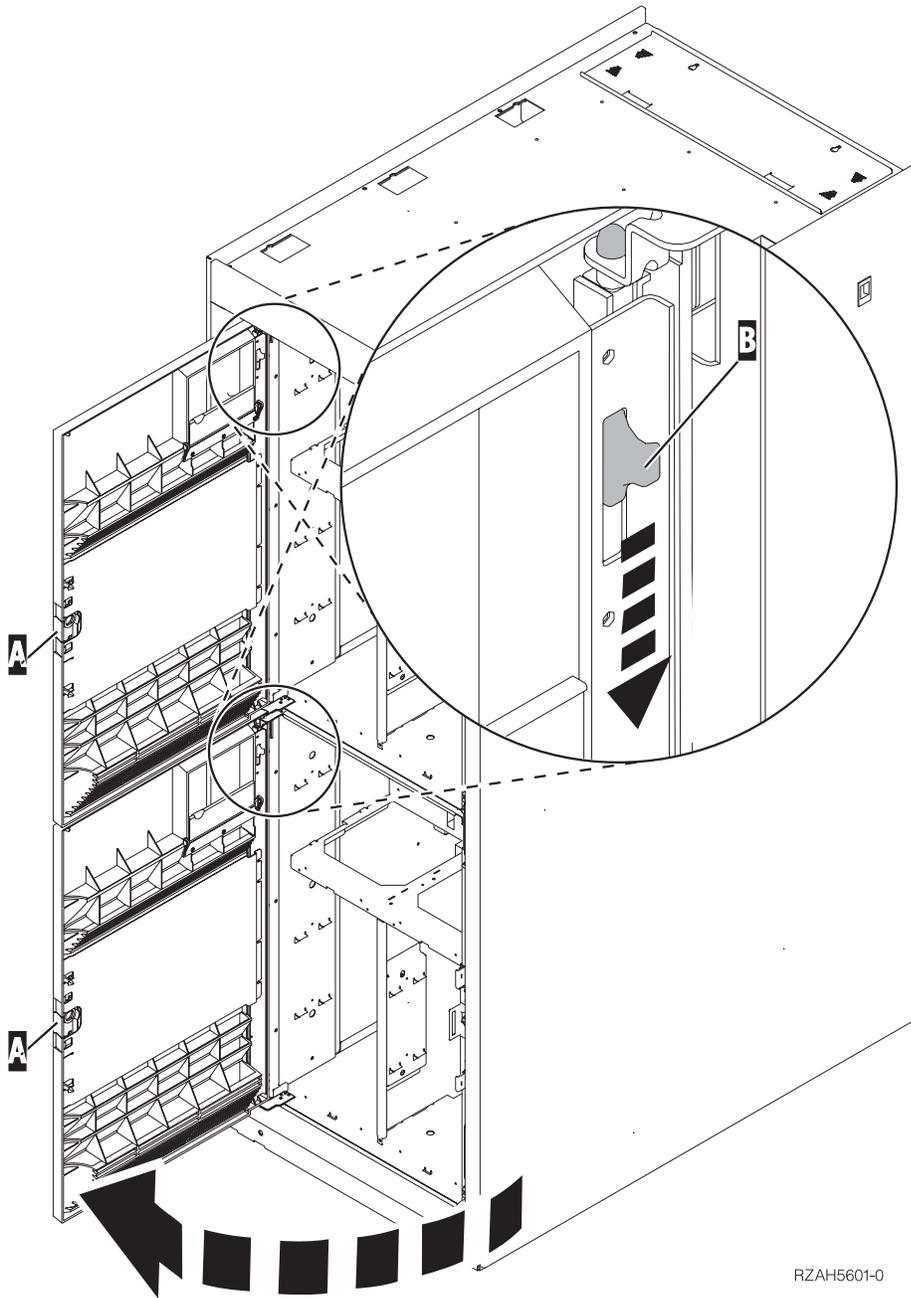
Figure 72. Removing the expansion unit front door

### Remove the front door from the 5079 or 5294 expansion unit

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

To remove the front door from the expansion unit, follow these steps:

1. Open the front door **A** as shown in the following figure.
2. Press the latch **B** to remove the door.



RZAH5601-0

Figure 73. Removing the expansion unit front door

### Remove the back door from the 5074, 5079, and 5094 expansion unit

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

To remove the back door from the expansion unit, follow these steps:

- Open the back door A as shown in the following figure.
- Press the latch B to remove the door.

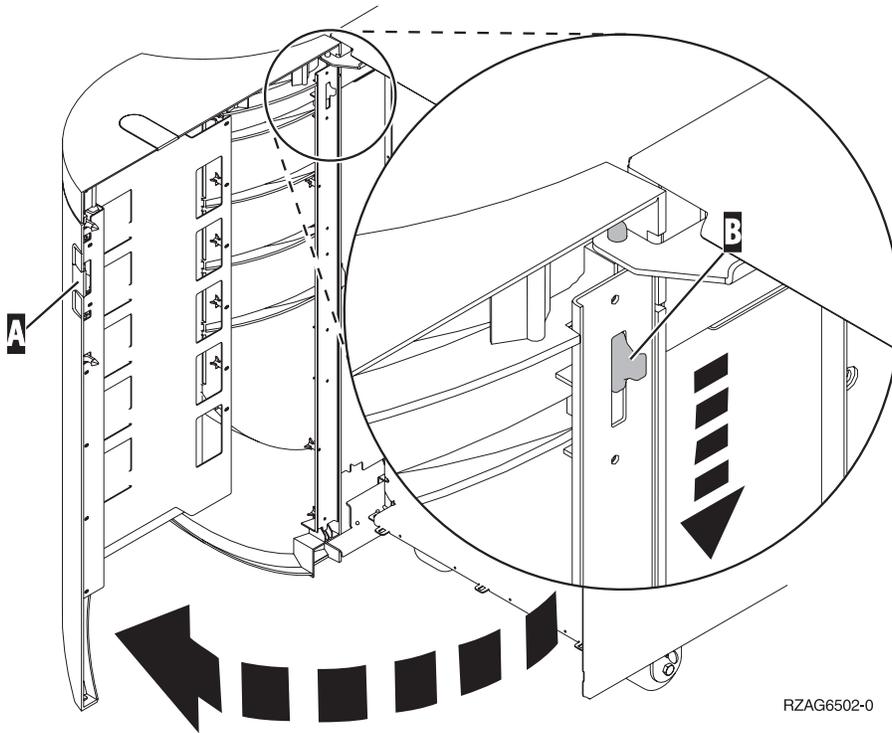
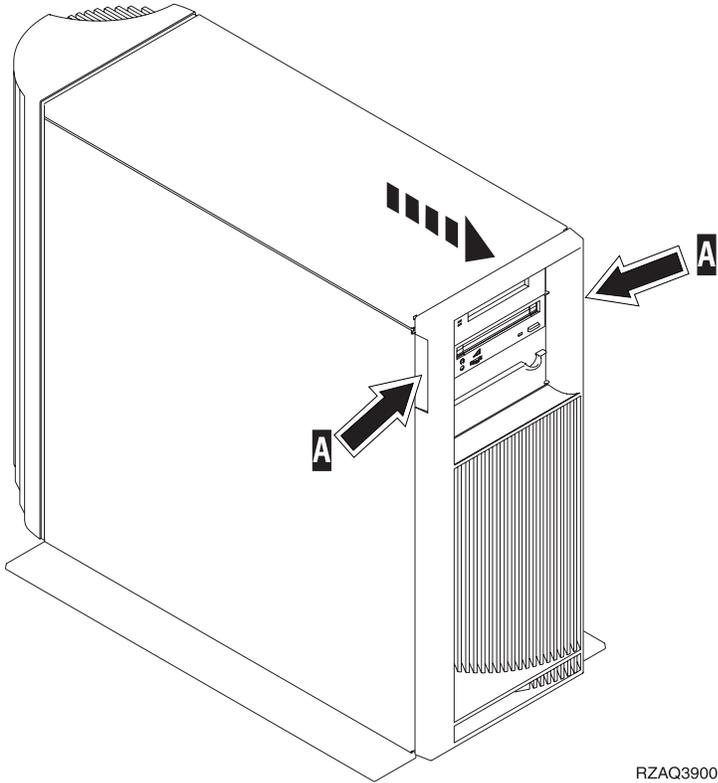


Figure 74. Removing the expansion unit back door

### Remove the front cover from the 5095 expansion unit

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

To remove the front cover from the expansion unit, grip the sides of the cover **A** and pull the cover toward you, as shown in the following figure.



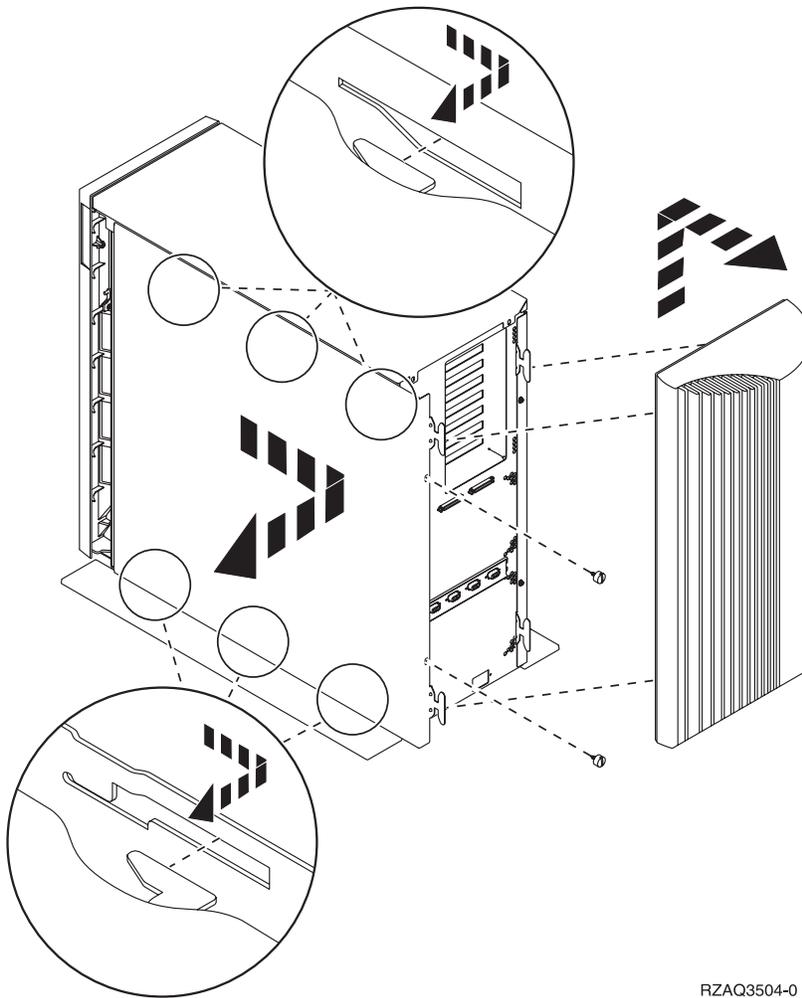
RZAQ3900-0

### Remove the back door and cover from the 5095 expansion unit

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

To remove the back door and cover from the expansion unit, follow these steps:

1. Place your hand near the bottom of the back cover and lift up and out.  
**Attention:** If you remove the cover while the server is powered on, errors might occur due to electromagnetic interference.
2. Remove the left cover, view from back, by loosening the thumbscrews and sliding the cover from front to back until it stops.



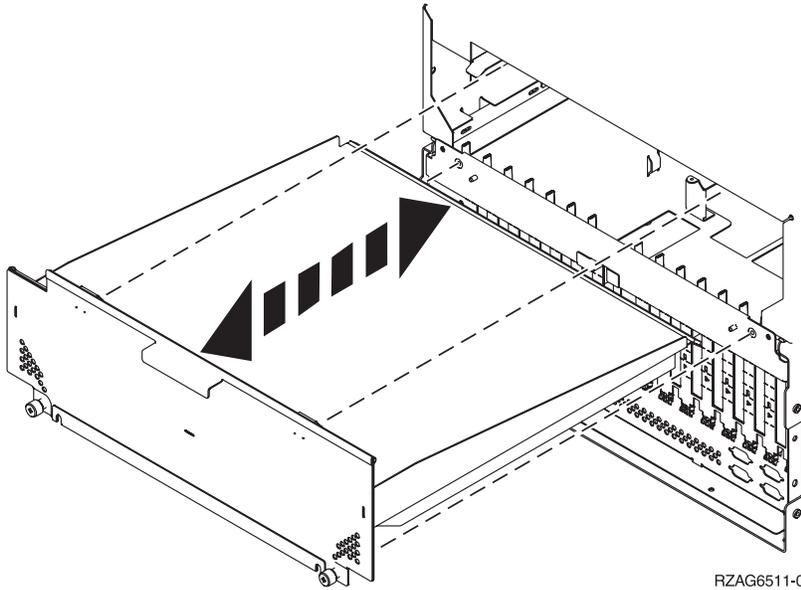
RZAQ3504-0

3. Pull the cover out.

### **Remove the back cover from the 0588 expansion unit**

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

Open the back cover and remove the air flow shield, as shown in the following figure.



### **Remove and install the front cover on the 5791 or 5794 expansion unit**

You might need to remove and install the front cover to access components or perform service. This section includes instructions to accomplish these tasks.

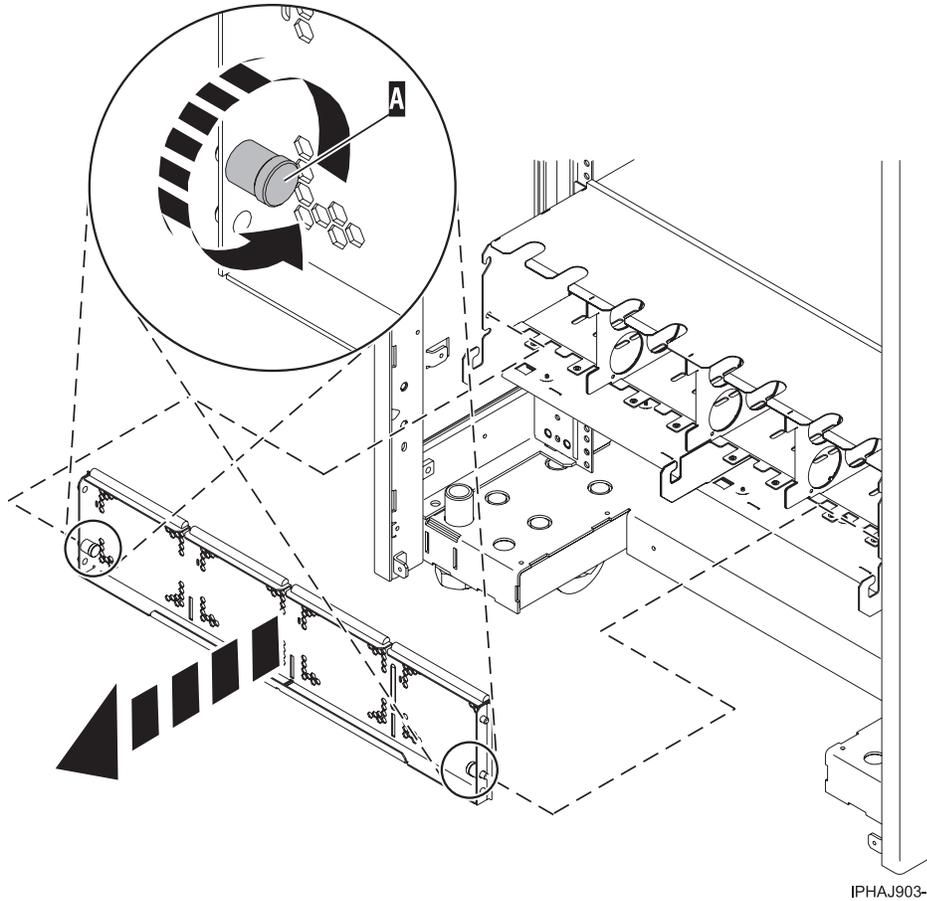
#### **Remove the front cover from the 7311-D11, 5791, or 5794 expansion unit:**

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

To remove the front cover, follow these steps:

1. Open the rack front door, if necessary.

2. Pull in the knobs on the left and right of the front cover as shown in the following figure:



IPHAJ903-0

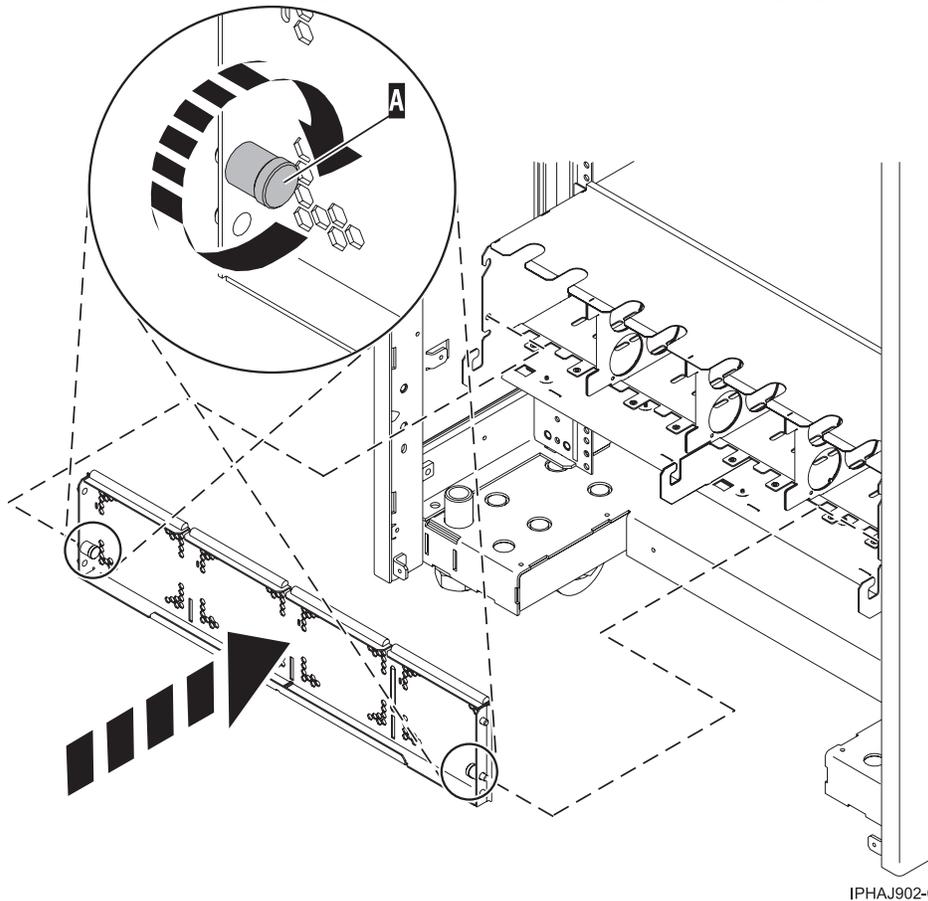
3. Pull the cover out and away from the expansion unit.

**Install the front cover on the 7311-D11, 5791, or 5794 expansion unit:**

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

To install the front cover, follow these steps:

1. Position the cover on the front of the expansion unit so that the pins on the cover line up with the slots on the front of the expansion unit as shown in the following figure:



IPHAJ902-0

2. Pull in the knobs on the left and right of the front cover.
3. Push the cover on to the front of the expansion unit.
4. Release the knobs on the left and right of the front cover.

## Place the model 51x or 710 in the operating position

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

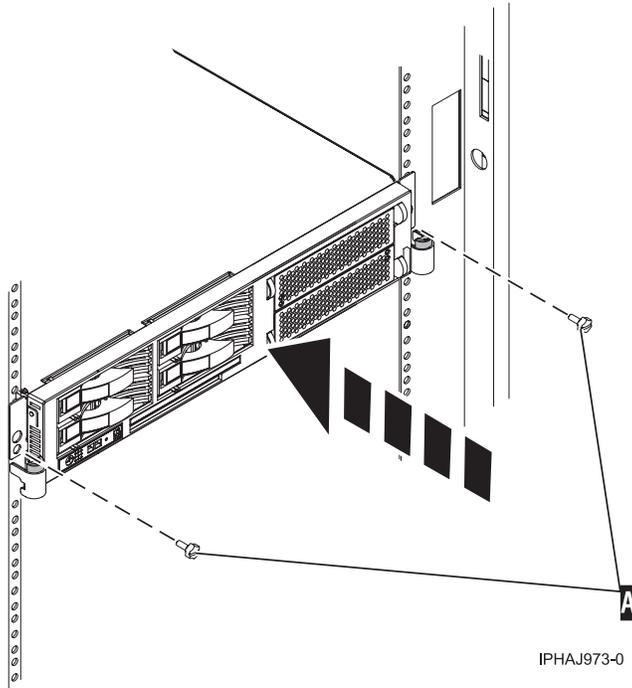
**Tip:** Some of the figures in these procedures might not look exactly like the system unit that you have. However, the steps to perform the task are the same.

To place the system unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches, located near the middle of each rail, and push the system unit into the rack. Both rack latches should lock into position.

**Important:** Ensure that the cables at the rear of the system unit do not catch or bind as you push the unit back into the rack.

2. Replace and tighten the two thumbscrews **A** that secure the system unit to the rack as shown in the following figure.



3. Close the front rack door.

## Install a feature using the Hardware Management Console

You might need to use the Hardware Management Console to install a feature. Use the procedure in this section to perform this task.

- If you are using if you are using an HMC with Version 6 or earlier use the following steps 1
  - If you are using a an HMC with Version 7 or later use the steps in the next section “Install a feature using the HMC Version 7 or later” on page 117
1. In the navigation area, expand **Management Environment**.
  2. Expand the managed system into which you are installing a feature.
  3. Expand **Service Applications**.
  4. Select **Service Focal Point**.
  5. In the contents area, select **Install/Add/Remove Hardware**.
  6. In the **Install/Add/Remove Hardware** window, highlight system or unit into which you are installing a feature.
  7. Click **Selected**.
  8. From the Selected menu, select **Add FRU**.
  9. In the **Enclosure type** field, select the system or expansion unit into which you are installing a feature.
  10. In the FRU types for selected enclosure, select the feature you are installing.
  11. Click **Next**.
  12. Follow the instructions to install the feature.

**Note:** The HMC might open the information center instructions for installing the feature. If so, follow these instructions to install the feature.

## Install a feature using the HMC Version 7 or later

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system you will install the part in.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Add FRU**.
7. In the **Add/Install/Remove Hardware** window select the system or enclosure into which you are installing the feature.
8. Select the type of feature you are installing from the menu and click **Next**
9. Select the location code for where you will install the feature and click **Add**.
10. Once the FRU is in pending actions click **Launch Procedure** and follow the instructions to install the feature.

**Note:** The HMC might open external instructions for installing the feature. If so, follow these instructions to install the feature.

## Remove a part using the Hardware Management Console

You might need to use the Hardware Management Console to facilitate removing a part from your managed system. Use the procedure in this section to accomplish this task.

- If you are using if you are using an HMC with Version 6 or earlier use the following steps 1.
- If you are using a an HMC with Version 7 or later use the steps in the next section “Remove a part using the HMC Version 7 or later.”

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

1. In the navigation area, expand the **Management Environment**.
2. Expand the managed system in which you are replacing a part.
3. Expand **Service Applications**.
4. Select **Service Focal Point**.
5. In the contents area, select **Install/Add/Remove Hardware**.
6. In the **Install/Add/Remove Hardware** window, click System Processor.
7. From the Selected menu, select **Remove FRU**.
8. In the **Installed enclosure types** field, select the system or expansion unit from which you are removing a part.
9. In the Available FRU types for selected enclosure, select the part you are removing.
10. Click **Next**.
11. Follow the instructions to remove the part.

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

## Remove a part using the HMC Version 7 or later

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system from which you are removing a part.
4. In the Tasks area expand **Serviceability**.

5. Expand **Hardware**.
6. Select **Remove FRU**.
7. In the **Add/Install/Remove Hardware - Remove FRU, Select FRU Type** window select the system or enclosure from which you are removing the part from the list.
8. Select the type of part you are removing from the menu and click **Next**.
9. Select the location of the part you are removing and click **Add**.
10. Once the part is listed in **Pending Actions** click **Launch Procedure** and follow the instructions to remove the part.

**Note:** The HMC might open external instructions for removing the part. If so, follow these instructions to remove the part.

## Replace a part using the Hardware Management Console

You might need to use the Hardware Management Console to replace a part in your managed system. Use the procedure in this section to accomplish this task.

To use the Hardware Management Console Version 6 or earlier, follow these steps, 1

1. In the navigation area, expand the **Management Environment**.
2. Expand the managed system in which you are replacing a part.
3. Expand **Service Applications**.
4. Select **Service Focal Point**.
5. In the contents area, select **Repair Serviceable Event**.
6. Select the system and click **OK**.
7. In the window, click the problem number for the part you want to replace.
8. Follow the instructions to replace the part.

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

## Exchange a part using the HMC Version 7

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

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

## Identify a failing part

Use the instructions in this section to learn how to locate and identify a failing part on your system or expansion unit using the appropriate method for your system.

## Identify a failing part on an AIX system or logical partition

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

### Locate a failing part in an AIX system or logical partition:

You might need to use AIX tools, before activating the indicator light, to locate a part that is failing. Use the procedure in this section to accomplish this task.

1. Log in as root user or celogin-.
2. At the command line, type `diag` and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the **Display Previous Diagnostic Results** display, select **Display Diagnostic Log Summary**. A **Display Diagnostic Log** display appears. This display contains a chronological list of events.
6. Look in the T column for the most recent S entry. Select this row in the table and press Enter.
7. Choose **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see “Activate the indicator light for the failing part.”

### Activate the indicator light for the failing part:

You might need to use the indicator light to help you physically locate a part. Use the procedure in this section to accomplish this task.

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. From the **Function Selection** menu, select **Task Selection**. Press Enter.
4. From the **Task Selection** menu, select **Identify and Attention Indicators**. Press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

## Identify a failing part on an i5/OS system or logical partition

You might need to activate or deactivate the indicator light using i5/OS to assist in locating a failing part. Use the instructions in this section to accomplish these tasks.

### Activate the failing-part indicator light:

You might need to search the service action log for an entry that matches the time, reference code, or resource of a problem, and then activate the indicator light for a failing part. Use the procedure in this section to accomplish this task.

1. Signed on to an i5/OS session, **with at least service level authority**.
2. On the command line of the i5/OS session, type `strsst` and press Enter.

**Note:** If you cannot get to the System Service Tools display, use function 21 from the control panel. Alternatively, if the system is managed by a Hardware Management Console (HMC), use the Service Focal Point utilities to get to the Dedicated Service Tools (DST) display.

3. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

**Remember:** The service tools password is case-sensitive.

4. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
5. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
6. Select **Work with service action log** from the Hardware Service Manager display. Press Enter.
7. On the Select Timeframe display, change the **From: Date and Time** field to a date and time prior to when the problem occurred.
8. Search for an entry that matches one or more conditions of the problem:
  - Reference code
  - Resource
  - Date and Time
  - Failing item list
9. Select option **2**, Display failing item information, to display the service action log entry.
10. Select option **2**, Display details, to display location information for the failing part to be replaced. The information displayed in the date and time fields is the date and time for the first occurrence of the specific reference code for the resource displayed during the time range selected.
11. If location information is available, select option **6**, indicator on, to turn on the failing part's indicator light.

**Tip:** If the failing part does not contain a physical indicator light, a higher-level indicator light will be activated. For example, the indicator light for the backplane or unit that contains the failing part might be lit. In this case, use the location information to locate the actual failing part.

12. Look for the enclosure indicator light to locate the enclosure that contains the failing part.

#### **Deactivate the failing-part indicator light:**

If you turned on the indicator light during a removal and replacement procedure, turn it off to complete that procedure. Use the instructions in this section to accomplish this task.

1. Select option **7**, Indicator off, to turn off the indicator light.
2. If all problems have been resolved, use the **Acknowledge all errors** function at the bottom of the service action log display.
3. Close the log entry by selecting option **8**, Close a new entry, on the service action log report display.

#### **Identify a failing part on a Linux system or logical partition**

Use the instructions in this section to learn how to identify a failing part using one of a number of methods on a system or logical partition running Linux.

#### **Locate a failing part and activate the indicator light:**

If the service aids have been installed on a system or logical partition running Linux, you can use the instructions in this section to locate the failing part, and then activate the indicator light for that part.

*Locate a failing part in a Linux system or logical partition:*

If you do not know the location code of the failing part, use the instructions in this section to locate the failing part.

To locate the failing part in a system or logical partition running Linux, follow these steps:

1. Log in as root user.
2. At the command line, type `grep diagela /var/log/platform` and press Enter.
3. Look for the most recent entry that contains a system reference code (SRC).
4. Record the location information.

### Activate the indicator light for the failing part:

If you know the location code of the failing part, activate the indicator light to help you locate which part to replace. Use the procedure in this section to accomplish this task.

To activate the indicator light, follow these steps:

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s identify -l<location code>` and press Enter. Substituting the location code of the failing unit for `<location code>`.
3. Look for the system attention light to identify the enclosure that contains the failing part.

### Deactivate the failing-part indicator light:

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

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s normal -l<location code>` and press Enter. Substitute the location code of the failing unit for `<location code>`.
3. Look for the system attention light to identify the enclosure that contains the failing part.

### Identify a failing part using stand-alone eServer diagnostics:

If the operating system is stopped or if you need to stop the system or logical partition to replace the failing part, use the procedure in this section to identify a failing part.

You can use stand-alone diagnostics to identify a failing part in a Linux system, expansion unit, or logical partition. You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the Network Installation Management (NIM) Server, see Running the stand-alone eServer™ diagnostics from a Network Installation Management server.

#### Prerequisites:

- If this server is directly attached to another server or attached to a network, be sure communications with the other servers are stopped.
- Ensure that no other activity is running on the logical partition. Stand-alone eServer diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- You must have access to the system console to use stand-alone eServer diagnostics.

To use stand-alone diagnostics from a CD-ROM, follow these steps:

1. Stop all jobs and applications, and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power.

**Note:** The next step starts the server or logical partition from the eServer stand-alone diagnostic CD-ROM. If the CD-ROM or DVD-ROM drive is not available as the startup device on the server or logical partition on which you are working, follow these steps:

- a. Access the Advanced System Management Interface (ASMI). See Managing your server using the Advanced System Management Interface for information on using the ASMI.
- b. On the ASMI main menu, click **Power/Restart Control**.
- c. Click **Power On/Off System**.
- d. Select the **Service mode boot** from **default boot list** option in the AIX or Linux logical partition mode boot list.

- e. Click **Save settings** and power on the system. As soon as the optical drive has power, insert the AIX diagnostic diskette.
  - f. Go to step 5.
4. Turn on the system unit power and insert the diagnostics CD-ROM into the CD-ROM drive.
  5. After the keyboard POST indicator displays on the firmware console and before the last POST indicator (speaker) displays, press the 5 key on either the directly attached keyboard or the ASCII terminal. This indicates that a service mode boot should be initiated using the default service mode boot list.
  6. Enter any requested password.
  7. At the Diagnostic Operating Instructions display, press Enter.

**Tip:** If the Diagnostic Operating Instructions display does not appear, contact your support center for assistance.

8. If the terminal type is requested, use the **Initialize Terminal** option on the **Function Selection** menu to initialize the operating system.

## Identify a failing part using the Advanced System Management Interface

If the Linux operating system is running on the system or logical partition, use the procedure in this section to identify a failing part.

To activate the indicator light for a failing part, follow these steps:

1. If the unit ID does not match the label on the system or expansion unit, update the configuration information.
  - For information on setting up the ASMI refer to Accessing the Advanced System Management Interface.
  - For information on using the ASMI, refer to Managing your server using the Advanced System Management Interface
2. Turn on the failing part indicator light. For instructions, see Changing service indicators.

## Verify the installed part

Use the instructions in this section to learn how to verify a newly installed or replaced part on your system, logical partition, or expansion unit by selecting the appropriate procedure for the operating system or console.

## Verify an installed feature or replaced part on an AIX system or logical partition

If you installed feature or replaced a part you might want to use the tools in AIX to verify that the feature or part is recognized by the system or logical partition. Use the procedure in this section to accomplish this task.

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

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

Verify the installed feature using AIX:

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. Select **Advanced Diagnostics Routines**. Press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
5. When the **Advanced Diagnostic Selection** menu appears, do one of the following:
  - To test a single resource, select the resource that you just installed from the list of resources and press Enter.

- To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
  7. Did the diagnostics run to completion and display the message No trouble was found?
    - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. You can learn more about these codes in Reference codes. Review the installation procedures to ensure that the new feature is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system is running in LPAR mode, note the logical partition in which you installed the feature. Contact your service provider for assistance.
    - **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part using AIX

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

1. Did you replace the part using either AIX or the online diagnostics service aid's concurrent (hot-swap) service operation?
  - No:** Go to step 2.
  - Yes:** Go to step 5.
2. Is the system powered off?
  - Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see Performing a slow boot.
  - No:** Go to step 4.
3. Start the system and wait until the AIX operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.
 

Did the AIX login prompt display?

  - **Yes:** Go to step 4
  - **No:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. You can learn more about these codes in the Reference codes. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system does not start or you have no login prompt, see: Problems with loading and starting the operating system.

If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.
4. At the command prompt, type `diag -a` and press Enter to check for missing resources. If you see a command prompt, go to step 5.
 

If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:

  - a. Select the resource and press Enter.
  - b. Select **Commit**.
  - c. Follow any instructions that are shown.
  - d. If a *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.
  - e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and go to AIX fast-path problem isolation.
  - f. If no SRN is shown, go to 5.
5. Test the part by doing the following:
  - a. At the command line, type `diag` and press Enter.

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

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

**No:** Go to step 6.

**Yes:** Go to step 7.

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 on page 125.

**Yes:** Go to step 12.

11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?

**No:** Contact your service provider. **This ends the procedure.**

**Yes:** Go to step 12.

12. Are the indicator lights still on?

- **No. This ends the procedure.**
- **Yes.** Turn off the lights. See one of the following for instructions:
  - Identify a failing part using stand-alone eServer diagnostics
  - Running the stand-alone eServer diagnostics from a Network Installation Management server
  - Changing service indicators with the ASMI menus

### **Verify the presence of an installed part on an i5/OS system or logical partition**

If you have installed a new feature or part, verify that the system recognizes the feature or part by using the i5/OS system service tools. Use the procedure in this section to accomplish this task.

1. Deactivate the failing item indicator light and close the service action log entry. For instructions, see “Deactivate the failing-part indicator light” on page 120.
2. Be sure you are signed on **with at least service level authority**.
3. On the command line of the i5/OS session, type `strsst` and press Enter.

**Note:** If you cannot get to the System Service Tools display, use function 21 from the control panel. Alternatively, if the system is managed by Hardware Management Console (HMC), use the Service Focal Point Utilities to get to the Dedicated Service Tools (DST) display.

4. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

**Note:** The service tools password is case-sensitive.

5. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
6. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
7. Select **Logical hardware resources (buses, IOPs, controllers)** from the Hardware Service Manager display. This option allows you to display and work with logical resources. Logical hardware resources are the functional resources of the system used by the operating system.
8. Press Enter.

When you select one of the options from the Logical Hardware Resources display, you can do the following:

- Display logical hardware resource status
- Display or change logical hardware resource information
- Display associated packaging hardware resources

For more information on collecting information and performing specific functions using the options and function keys from the Logical Hardware Resources display or for details on the symbols that appear next to the Resource Description field, see the online Help information.

### **Verify the installed part on a Linux system or logical partition (run AIX diagnostics)**

If you have installed a new part, use the instructions in this section to learn how to verify that the system recognizes the part.

To verify the newly installed or replaced part, choose one of the following:

## Verify an installed part using the eServer stand-alone diagnostics:

If you have installed or replaced a part, verify that the system recognizes the new part. Use the procedure in this section to accomplish this task.

You can use stand-alone diagnostics to verify an installed part in a Linux system, expansion unit, or logical partition. You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the Network Installation Management (NIM) server, see *Running the eServer stand-alone diagnostics from a Network Installation Management server*.

### Prerequisites

- If this server is directly attached to another server or attached to a network, be sure communication with the other servers is stopped.
- eServer stand-alone diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- eServer stand-alone diagnostics require access to the system console.

To use stand-alone diagnostics, follow these steps:

1. Stop all jobs and applications and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power. The next step boots the server or logical partition from the eServer stand-alone diagnostics CD-ROM. If the optical drive is not available as the boot device on the server or logical partition on which you are working, follow these steps:
  - a. Access the ASMI. See *Managing your server using the Advanced System Management Interface* for information on using the ASMI.
  - b. On the ASMI main menu, click on **Power/Restart Control**.
  - c. Click on **Power On/Off System**.
  - d. Select the **Service mode boot from default boot list** option in the AIX/Linux logical partition mode boot drop-down menu.
  - e. Click on **Save settings and power on**. As soon as the optical drive has power, insert the eServer standalone diagnostic CD-ROM.
  - f. Go to step 5.
4. Turn on the system unit power and immediately insert the diagnostics CD-ROM into the optical drive.
5. After the **keyboard** POST indicator displays on the system console and before the last POST indicator (**speaker**) displays, press the numeric 5 key on the system console to indicate that a service mode boot should be initiated using the default service mode boot list.
6. Enter any requested password.
7. At the *Diagnostic Operating Instructions* display, press Enter.

**Note:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system will not boot or you have no login prompt go to *Problems with loading and starting the operating system*.

**Note:** If you received an SRN or any other reference code when you attempted to start the system, you can learn more about these codes in *Reference codes*.

8. If the terminal type is requested, you must use the **Initialize Terminal** option on the *Function Selection* menu to initialize the operating system before you can continue.

9. From the Function Selection menu, select **Advanced Diagnostics Routines**. Press Enter.
10. From the Diagnostic Mode Selection menu, select **System Verification**. Press Enter.
11. When the Advanced Diagnostic Selection menu appears, select **All Resources**, or test only the part you replaced, and any devices that are attached to the part you replaced, by selecting the diagnostics for the individual part. Press Enter.
12. Did the *Testing Complete, No trouble was found* message appear?
  - **No:** There is still a problem. Contact your service provider.
  - **Yes:** Go to step 13.
13. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
14. If the indicator lights are still on, follow these steps:
  - a. Select **Identify and Attention Indicators** from the *Task Selection* menu to turn off the system attention and indicator lights. Press Enter.
  - b. Select **Set System Attention Indicator to NORMAL** and press Enter.
  - c. Select **Set All Identify Indicators to NORMAL** and press Enter.
  - d. Choose **Commit**.
 

**Note:** This changes the system attention and identify indicators from the *Fault* state to the *Normal* state.
  - e. Exit to the command line.

## Verify the presence of an installed part using Hardware Management Console (HMC)

If you have installed or replaced a part, use the Hardware Management Console (HMC) to update your HMC records after you have completed a service action on your server. Use the procedure in this section to accomplish this task. If you have reference codes, symptoms, or location codes that you used during the service action, locate the records to use during this procedure.

1. At the HMC, examine the service action event log for any open service action events. See Viewing serviceable events for details.
2. Are there any service action events that are open?
  - No:** If the system attention LED is still on, use the HMC to turn off the LED. See Activating and Deactivating LEDs. **This ends the procedure.**
  - Yes:** Continue with the next step.
3. Record the list of open service action events.
4. Examine the details of the open service action event. Is the error code associated with this service action event the same as you gathered earlier.
  - **Yes:** Continue with the next step.
  - **No:** Choose from the following options:
    - Review the other serviceable events and find one that does match and continue with the next step.
    - If the log does not match what you had gathered earlier, contact your service provider.
5. Select and highlight the service action event from the Error Associated With This Serviceable Event window.
6. Click **Close Event**.
7. Add comments for the serviceable event. Include any unique additional information. Click **OK**.
8. Did you replace, add, or modify a FRU of the open service action event?
  - **No:** Select the **No FRU Replaced for this Serviceable Event** option and click **OK** to close the service action event.
  - **Yes:** Perform the following steps:

- a. From the FRU list, select a FRU that you need to update.
  - b. Double-click the FRU and update the FRU information.
  - c. Click **OK** to close the service action event.
9. If you continue to have problems, contact your service provider.

### **Verify the presence of an installed part using the Advanced System Management Interface**

If you have installed or replaced a part, verify that the system recognizes the new part and turn off the failing part indicator light. Use the procedure in this section to accomplish this task using the Advanced System Management Interface (ASMI).

For information on accessing up the ASMI, refer to Accessing the Advanced System Management Interface

Use the instructions from Changing service indicators to turn off the indicator light.

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## Appendix. Accessibility features

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

The following list includes the major accessibility features:

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

### IBM and accessibility

See the IBM Accessibility Center at <http://www.ibm.com/able/> for more information about the commitment that IBM has to accessibility.



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## Electronic emission notices

### Class A Notices

The following Class A statements apply to the IBM System i models and IBM System p servers with the exception of those that are specifically identified as Class B.

## **Federal Communications Commission (FCC) statement**

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

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

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

## **Industry Canada Compliance Statement**

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

## **Avis de conformité à la réglementation d'Industrie Canada**

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

## **European Community Compliance Statement**

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

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

European Community contact:  
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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.

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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

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## Germany Compliance Statement

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

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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.

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### **Class B Notices**

The following Class B statements apply to model 9111-520 (stand-alone version), 9131-52A (stand-alone version), 7047-185 and the 9111-285.

### **Federal Communications Commission (FCC) statement**

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

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

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

### **Industry Canada Compliance Statement**

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

### **Avis de conformité à la réglementation d'Industrie Canada**

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This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for an interference caused by using other than recommended cables and connectors.

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IBM Technical Regulations  
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## IBM Taiwan Product Service Contact Information

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台灣國際商業機器股份有限公司  
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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.

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

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