Power Systems

Servicing the IBM Power System S822LC (8335-GTB)

IBM

Power Systems

Servicing the IBM Power System S822LC (8335-GTB)

IBM

Contents

Common procedures for servicing or installing features in the 8335-GTB . . 189

Notices 215

Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation 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 documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

German safety information

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

Laser safety information

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

Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

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:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.

- For racks with AC power, 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.
- For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:
- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
  4. Remove the signal cables from the connectors.
  5. 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. For AC power, attach the power cords to the outlets.
  5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
  6. Turn on the devices.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

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. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).

- Each rack cabinet might have more than one power cord.
  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, 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.

(R001 part 2 of 2):

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.

CAUTION:

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building.

- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:**
  - **Remove all devices in the 32U position (compliance ID RACK-001 or 22U (compliance ID RR001) and above.**
  - **Ensure that the heaviest devices are installed in the bottom of the rack cabinet.**
  - **Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.**
- **If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.**
- **If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.**
- **Inspect the route that you plan to take to eliminate potential hazards.**
- **Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.**
- **Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).**
- **Ensure that all devices, shelves, drawers, doors, and cables are secure.**
- **Ensure that the four leveling pads are raised to their highest position.**
- **Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.**
- **Do not use a ramp inclined at more than 10 degrees.**
- **When the rack cabinet is in the new location, complete the following steps:**
  - **Lower the four leveling pads.**
  - **Install stabilizer brackets on the rack cabinet.**
  - **If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.**
- **If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.**

(R002)

(L001)

DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)

or

or

or

or

DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L007)

CAUTION: A hot surface nearby. (L007)

(L008)

CAUTION: Hazardous moving parts nearby. (L008)

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. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers many not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (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)

CAUTION:
The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:
- **___ Throw or immerse into water**
- **___ Heat to more than 100°C (212°F)**
- **___ Repair or disassemble**

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

CAUTION:

Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048)

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.

Removing and replacing parts in the IBM Power System S822LC (8335-GTB)

Use these procedures to remove and replace failing parts. These parts are referred to as field replaceable units (FRUs).

Note: See the International Information Bulletin for Customers - Installation of IBM Machines (http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss). This bulletin (Publication number SC27-6601-00) provides a list of the key IBM system installation activities and those activities that might be billable.

Before you begin a replacement, complete these tasks:

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

2. Review the installation or replacement procedure for the feature or part.

3. Note the significance of color on your system.
   - The color **terracotta** on the part indicates you might not need to power off the system to complete service. This determination depends on your system configuration, and you might need to complete steps to prepare the system before a service action can be completed on the system with the system power turned on.
   - The color **blue** on the part indicates that the procedure might require the system to be shut down before servicing. Check your service procedure before you attempt the repair.

4. Ensure that you have access to a medium, flat-blade screwdriver, and a Phillips screwdriver.

5. If parts are incorrect, missing, or visibly damaged, contact the provider of the part or your next level of support.

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

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.

- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:
- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
  4. Remove the signal cables from the connectors.
  5. 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. For AC power, attach the power cords to the outlets.
  5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
  6. Turn on the devices.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Attention:

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

For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before you power the system on.

For safety and airflow purposes and thermal performance, if you remove parts from the system, you must ensure that PCIe tailstock fillers are present.

Use the following precautions whenever you handle electronic components or cables.
- The electrostatic discharge (ESD) kit and the ESD wrist strap must be used when you handle logic cards, single chip modules (SCM), multichip modules (MCM), electronic boards, and disk drives.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove and then reinstall an electronic component, temporarily place the component on an ESD pad or blanket.

Removing and replacing the cold plates in the 8335-GTB

Learn how to remove and replace the cold plates in the water-cooled IBM Power® System S822LC (8335-GTB) system.

Removing the cold plates from the 8335-GTB system

Learn how to remove the cold plates in the water-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the four screws that secure the water hoses to the rear of the system as shown in Figure 1.
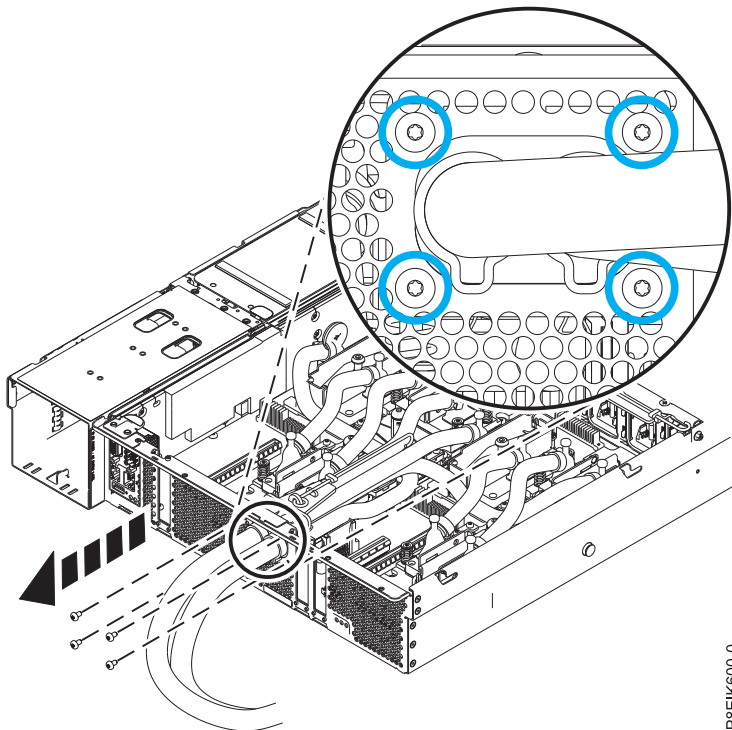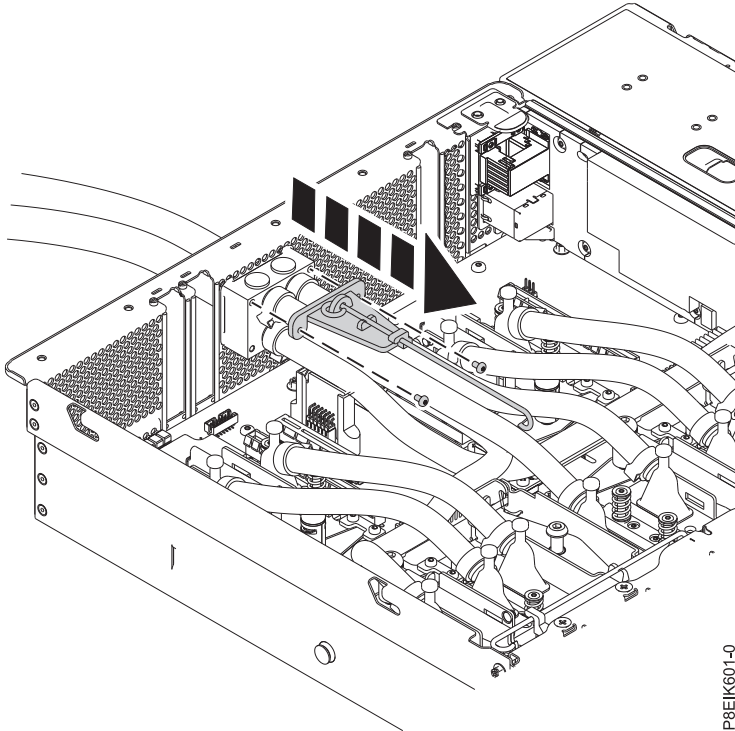

Figure 1. Removing the rear water hose screws

3. Remove the two screws that secure the rear cold plate service clip and remove the clip as shown in Figure 2 on page 4.

Figure 2. Removing the rear service clip

4. Pull the hoses through the rear wall of the system as shown in Figure 3 and Figure 4 on page 5.
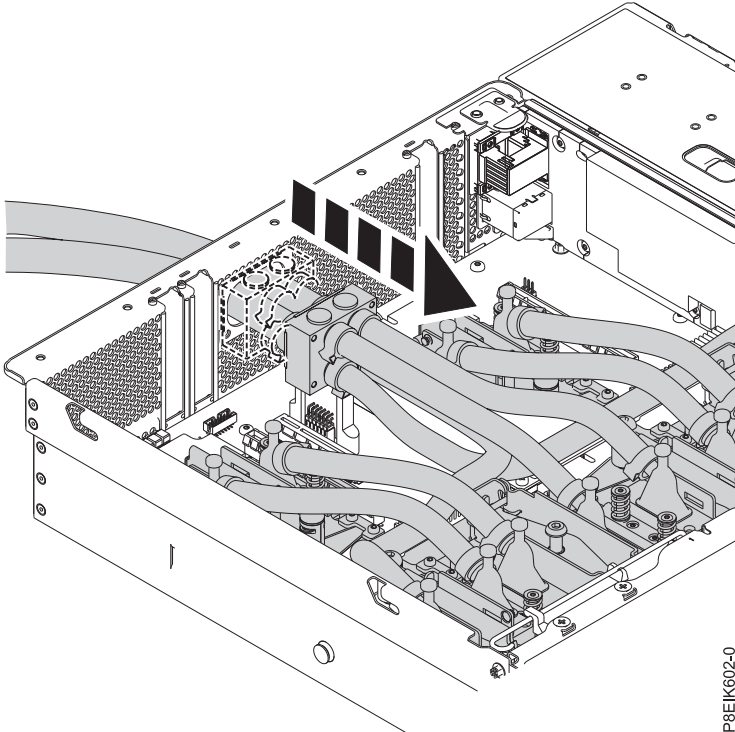
Figure 3. Removing the hoses

Figure 4. Passing the connectors through the rear wall, one at a time

5. Rest the removed hoses on the top of the rear wall as shown in Figure 5.

Figure 5. Resting the hoses on the rear wall

6. Familiarize yourself with the cold plate installation carrier. In this step, learn about the carrier and how to use it to more easily work with the cold plate assembly.

- The cold plate installation carrier has a plastic holder for each cold plate, directly over each cold plate as shown in Figure 6. The carrier has two extra holders.
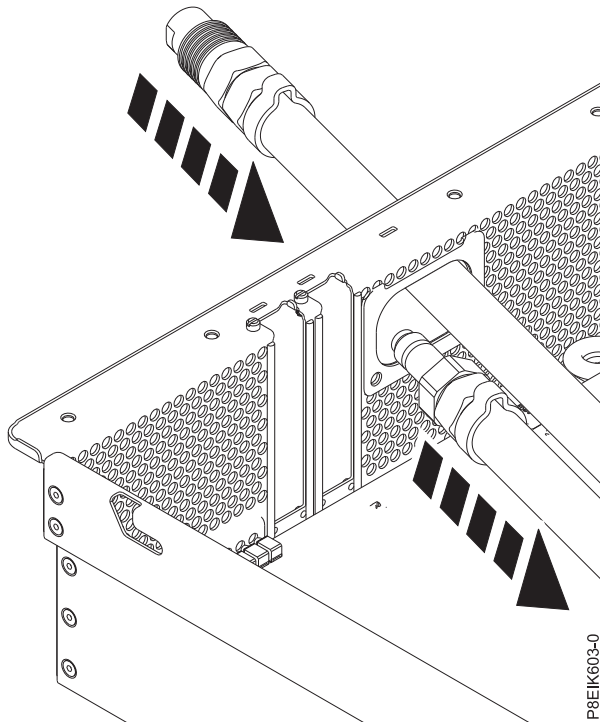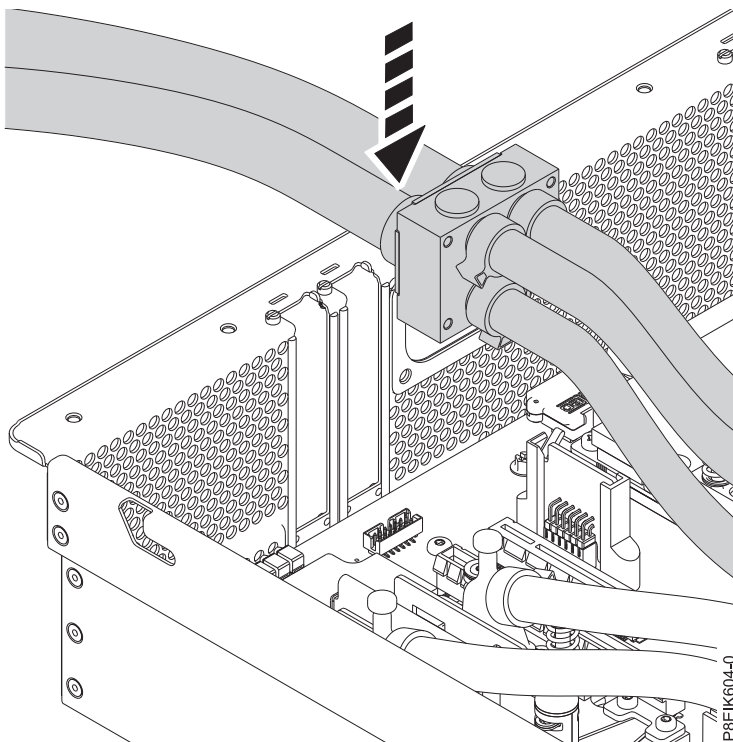- Each plastic holder can pivot up as needed to access the cold plates as shown in Figure 7 on page 7.
- Lift and pinch the plastic holder to remove it from the carrier as shown in Figure 8 on page 7. Removing the plastic holder makes it easier to attach and release the cold plate from the holder.
- Each plastic holder has two slots to secure the two pins on the top of each cold plate as shown in Figure 9 on page 8. Slide the holder near to the top of the pins, the pins are narrower at the top.
- The carrier has a hook-and-loop fastener to hold the water hoses as shown in Figure 10 on page 8.

P8EIK605-0
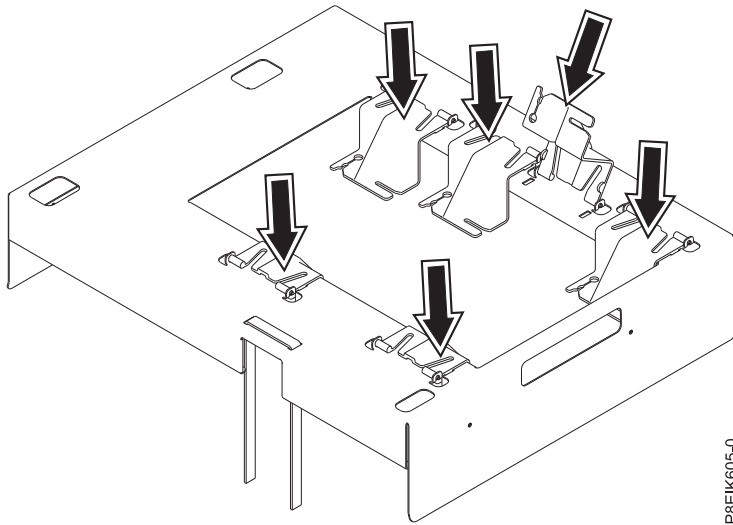
Figure 6. The cold plate installation carrier and the cold plate holders. The installation carrier is a metal frame that fits over the chassis. A plastic holder supports each cold plate; the holders are located directly over each cold plate.
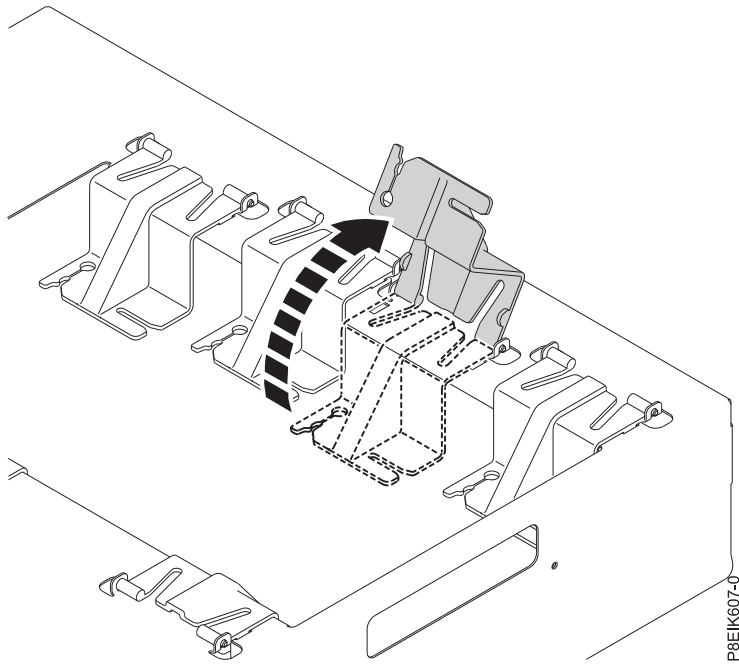
Figure 7. Pivoting the holder up to access a cold plate. Each plastic holder can pivot up as needed to access the cold plate.
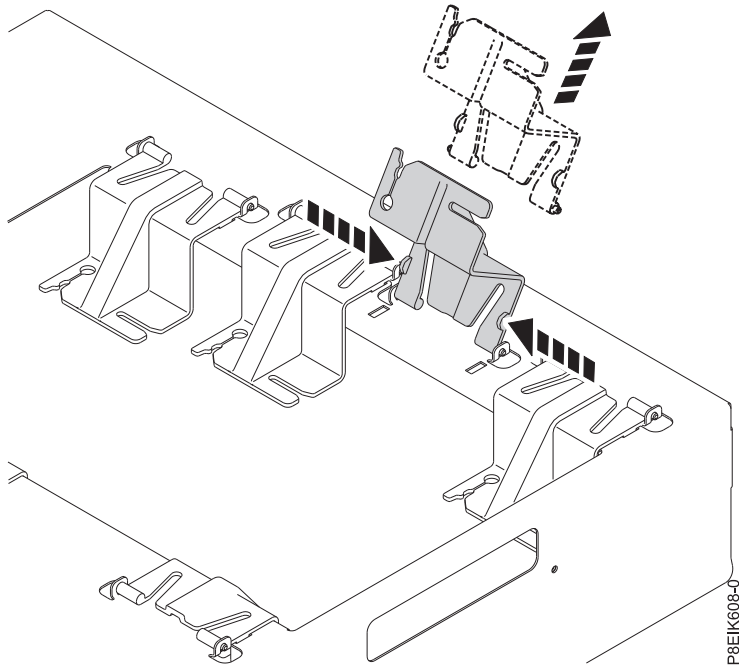
Figure 8. Removing a holder from the carrier. You can pinch the plastic holder to remove it from the carrier. You can more easily attach the cold plate pins to the holder when that holder is removed from the carrier.
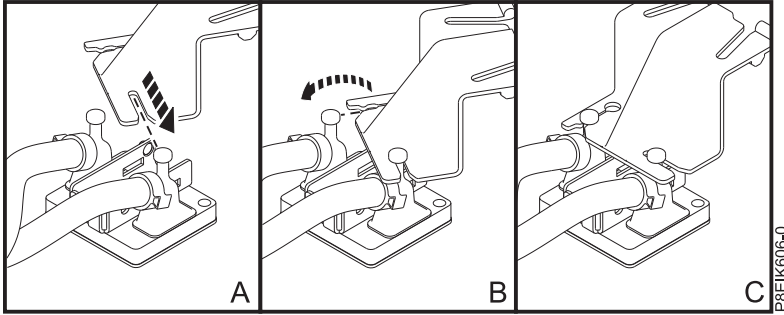
Figure 9. The cold plate holder slots and the cold plate pins. Each plastic holder has two slots to secure the two pins that are on the top of each cold plate. **(A)** First secure one pin to the holder, then **(B)** rotate the holder to secure the second pin. In **(C)** both pins are secured to the holder.

Now continue with the removal steps.
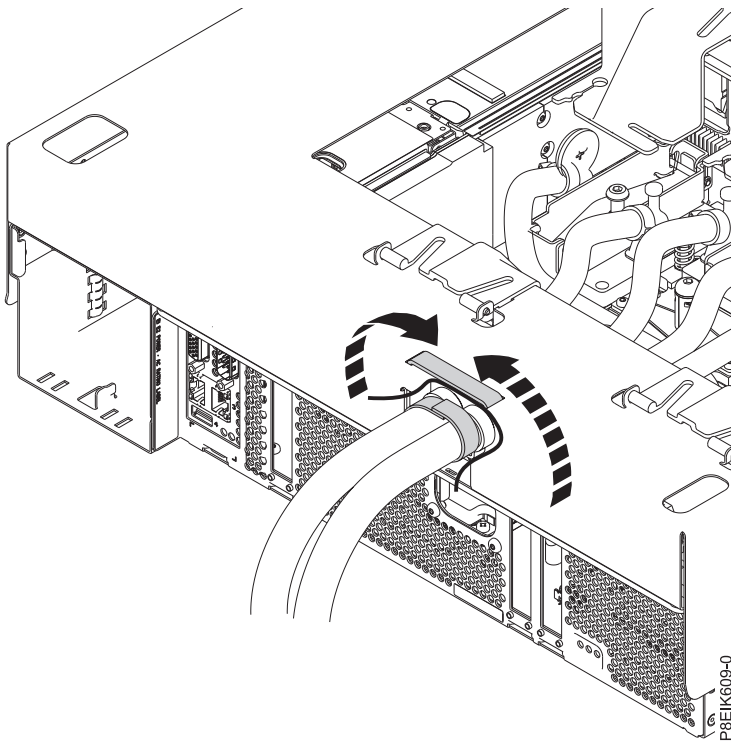
Figure 10. Fastening the water hoses to the carrier. The carrier has a hook-and-loop fastener to hold the water hoses when you are moving the entire cold plate assembly and carrier.

7. Open the hook-and-loop fastener on the cold plate installation carrier as shown in Figure 11 on page 9. It holds the water hoses.
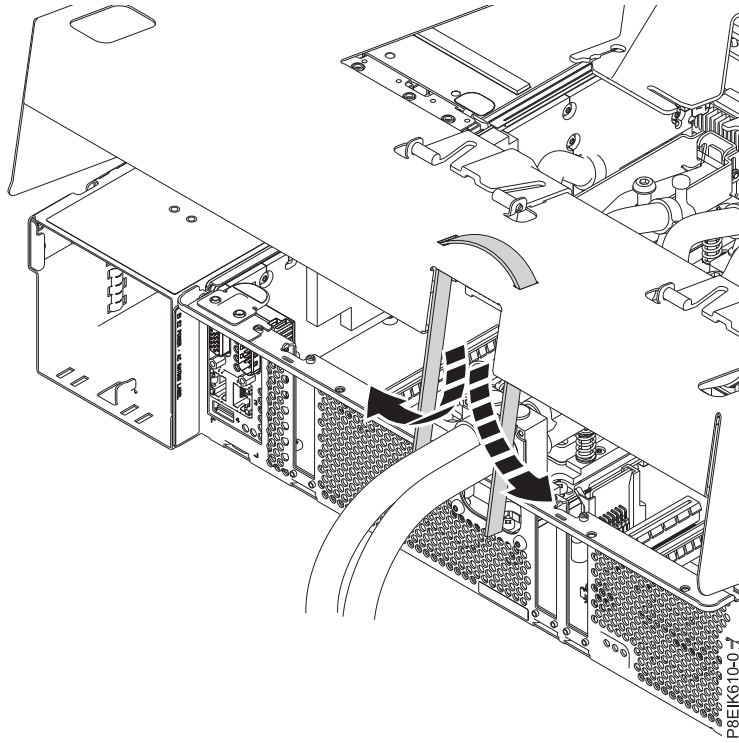
Figure 11. Opening the hook-and-loop fastener

8. Place the cold plate installation carrier over the system as shown in Figure 12 on page 10. Ensure that the alignment pins in the carrier fit into holes for the top cover.
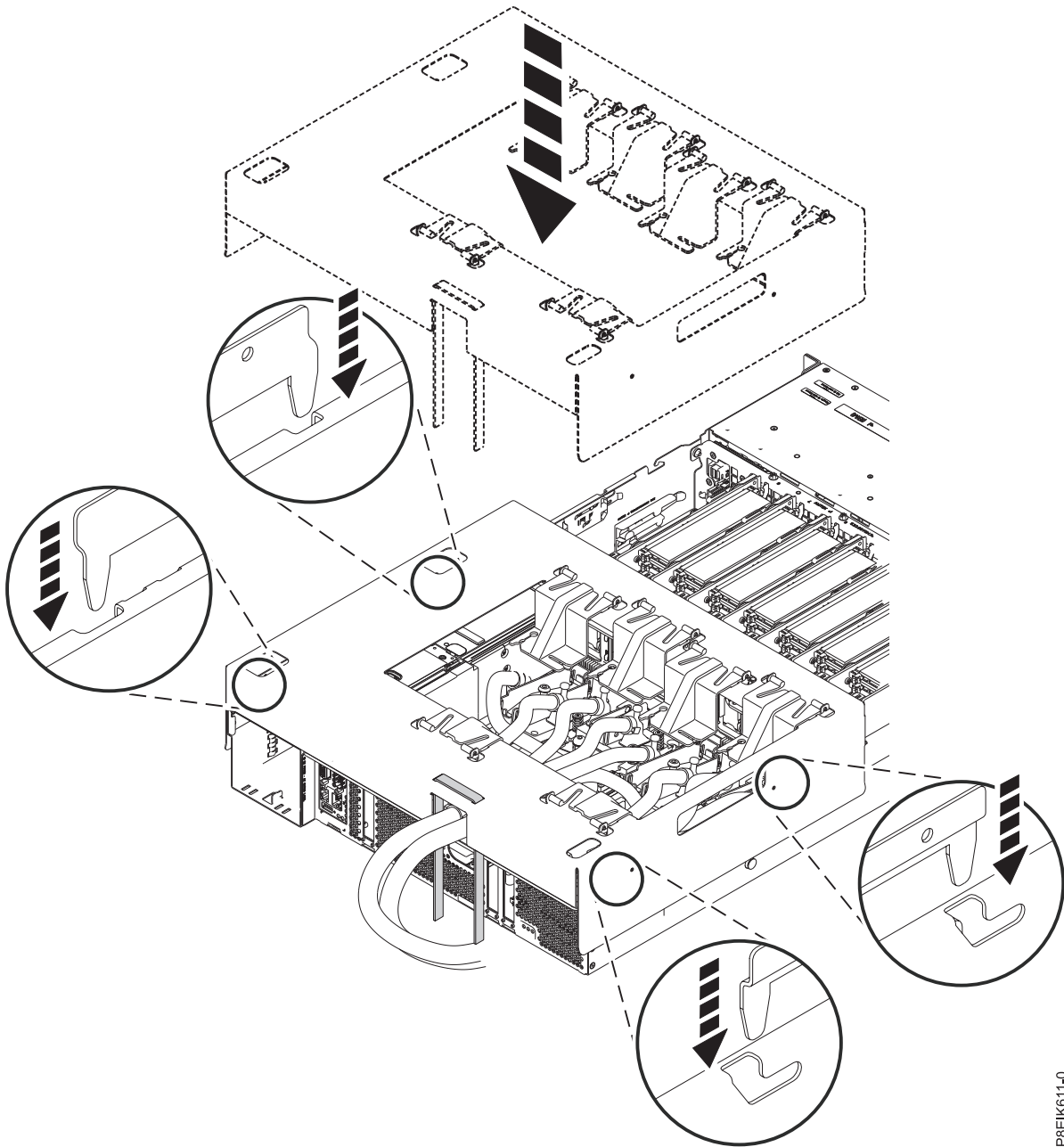
Figure 12. Lowering the cold plate installation carrier onto the system

9. Using the closed-loop fasteners, secure the water hoses to the cold plate installation carrier as shown in Figure 13 on page 11.
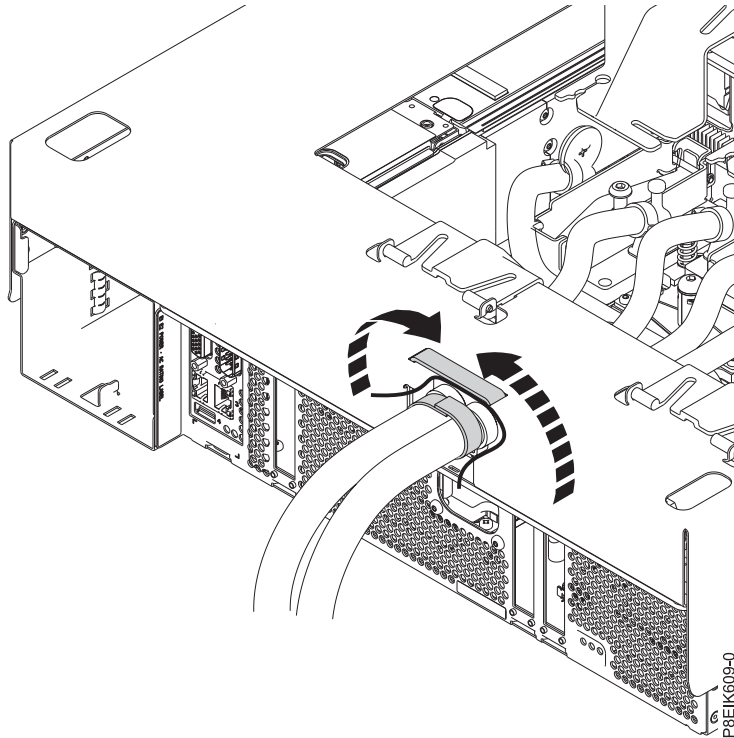
Figure 13. Fastening the water hoses to the carrier

10. One at a time, remove a GPU or processor cold plate, and then attach it the corresponding holder in the carrier. You can begin with removing the two GPUs near the rear of the system. Start with the cold plates that have their hoses closest to the top of the system, ending with the cold plates that have hoses closest to the bottom of the system.

   a. To access the screws that secure the GPU or processor cold plate, rotate the holder up as shown in Figure 14 on page 12.
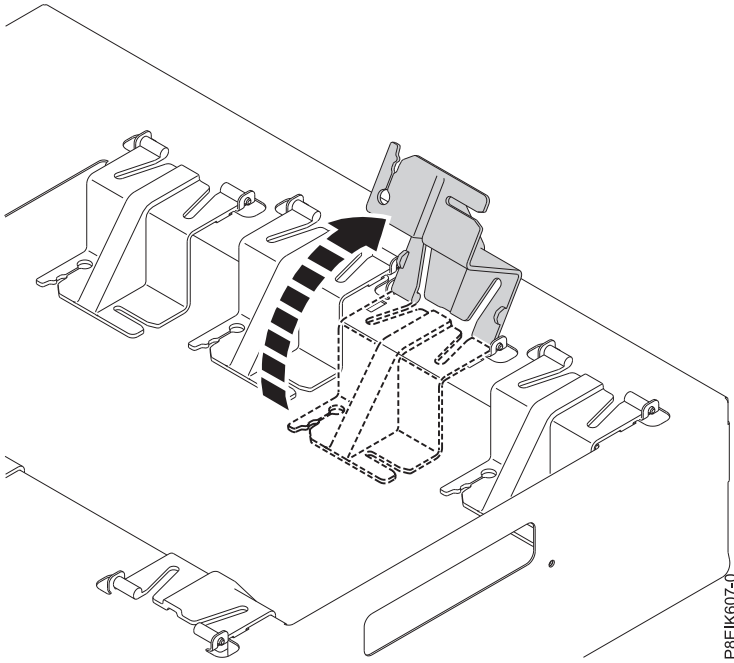
Figure 14. Holder pivoted up to access cold plate

   b. For a GPU, loosen the cold plate retainer screw and swing the retainer open as shown in Figure 15 on page 13.

     Attention: Do not unscrew the four spring-loaded screws that attach the aluminum heat cover to the GPU.
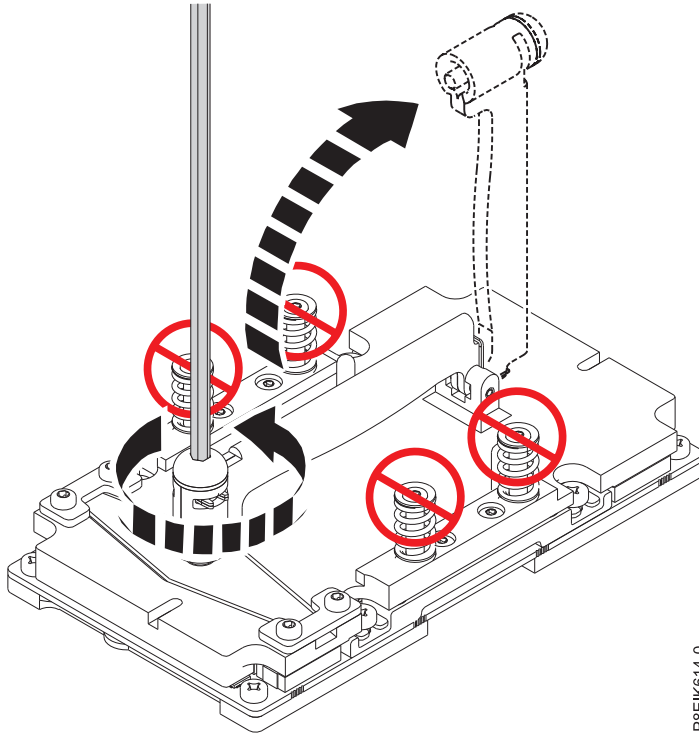
P8EIK614-0

Figure 15. Open the cold plate retainer

    c. For a processor module, loosen the cold plate retainer screw by turning the supplied hex key counterclockwise as shown in Figure 16. Loosen the screw until it moves freely.
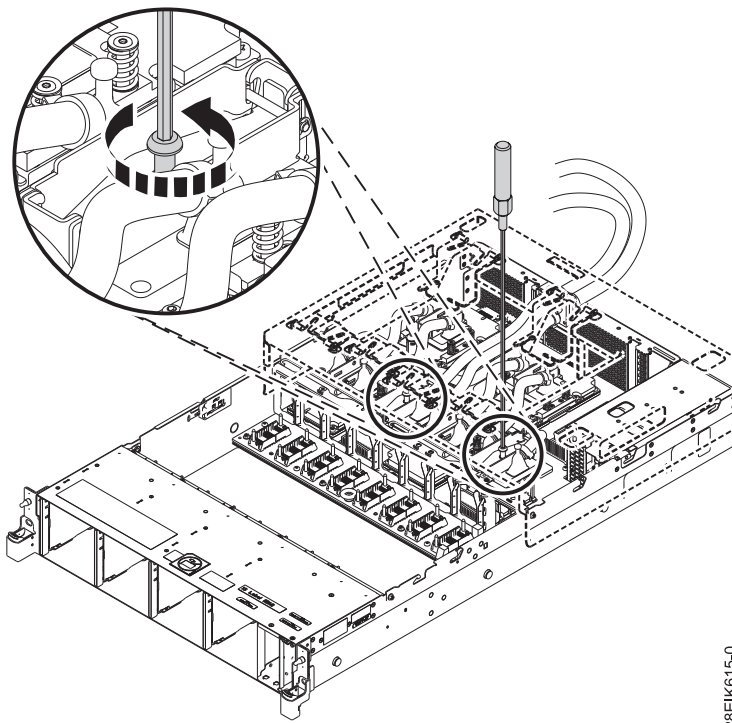
P8EIK615-0

Figure 16. Loosening the cold plate retainer screw

11. Secure the cold plate to its corresponding plastic holder, and then attach the holder to the carrier.
    a. Pivot the holder up. Pinch in at the sides to remove the holder from the carrier as shown in Figure 17.
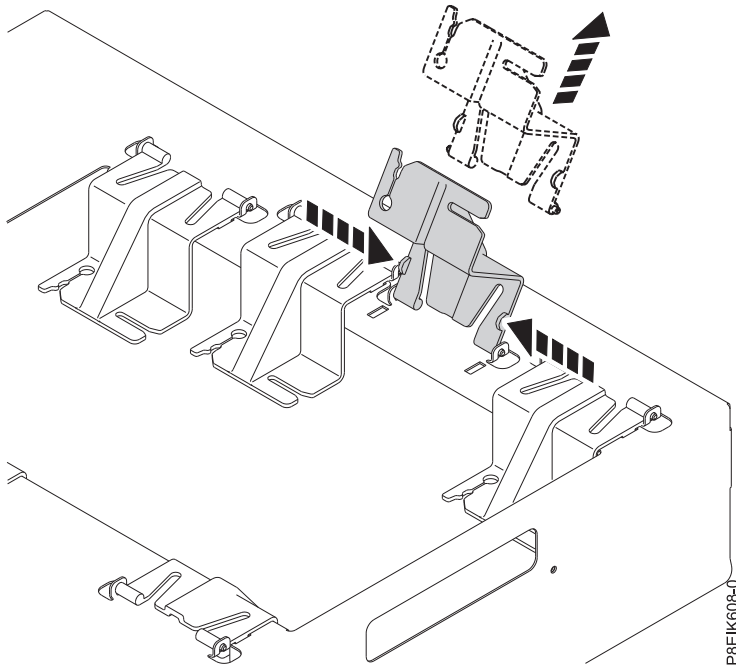
Figure 17. Removing holder from carrier

    b. Slide one cold plate pin into the holder as shown **(A)** in Figure 18. Push the pin into the slot only as far as is needed.
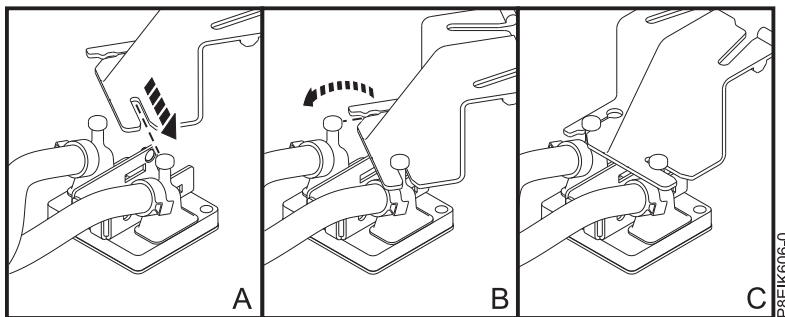
Figure 18. Inserting the cold plate pins into the holder

    c. Pivot the cold plate to slide the other pin into the holder as shown in **(B)** in Figure 18. Push the pin into the slot only as far as is needed.
    d. Pinch the holder at the sides **(B)** as shown in Figure 19 on page 15 and replace it onto the carrier.
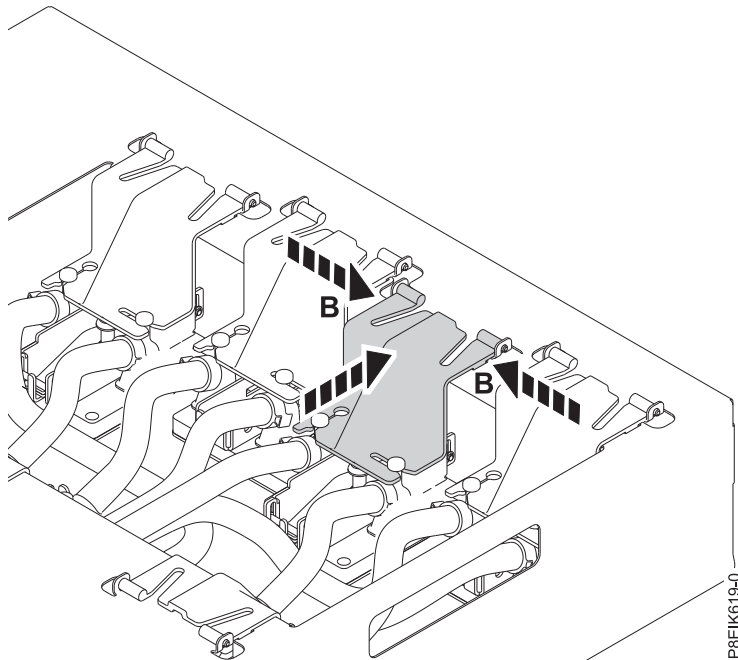
Figure 19. Replacing the holder back onto the carrier

12. Repeat from step 10 on page 11 for each cold plate.
13. After all the cold plates are attached to the cold plate installation carrier, lift the carrier **straight up** off the system as shown in Figure 20 on page 16. If you lift at an angle, the carrier catches on the cold plate clips.
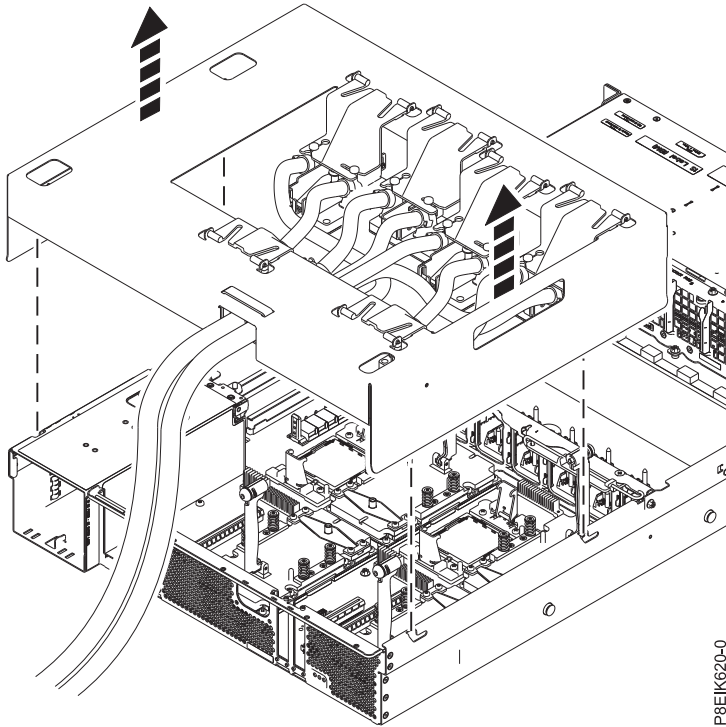
Figure 20. Lifting the cold plate installation carrier

14. To prevent the cold plates from being dented or damaged, place the cold plate installation carrier on a flat work surface to ensure that the cold plates in the carrier remain suspended above the work surface.

Replacing the cold plates in the 8335-GTB cold plate installation carrier

Learn how to replace the cold plates in the cold plate installation carrier that us used for the IBM Power System S822LC (8335-GTB) system.

Before you begin

To replace a faulty cold plate or water hose, you first need to do the procedure: "Removing the cold plates from the 8335-GTB system" on page 3

Procedure

1. On your work table, place the replacement cold plate assembly **(A)** next to the cold plate installation carrier as shown in Figure 21 on page 17.

A
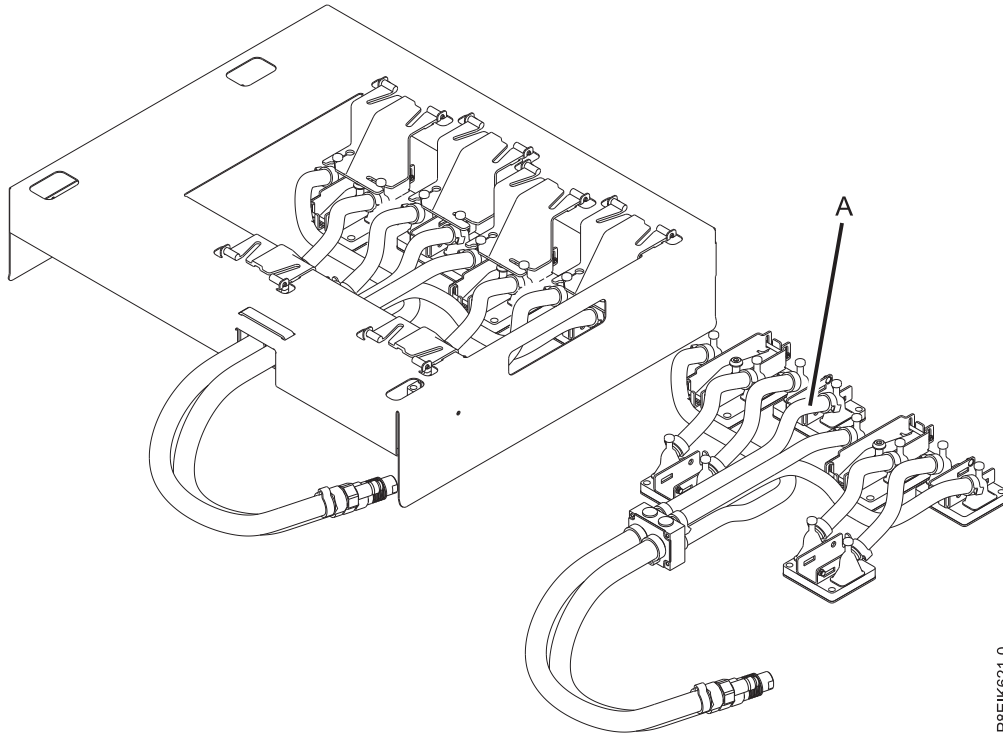
P8EIK621-0

Figure 21. Placing the replacement cold plate assembly next to the cold plate installation carrier

2. Remove each cold plate from its plastic holder.

   a. Remove a cold plate from its plastic holder. Lift and pinch the plastic holder at points **(A)** to remove it from the carrier as shown in Figure 22 on page 18.
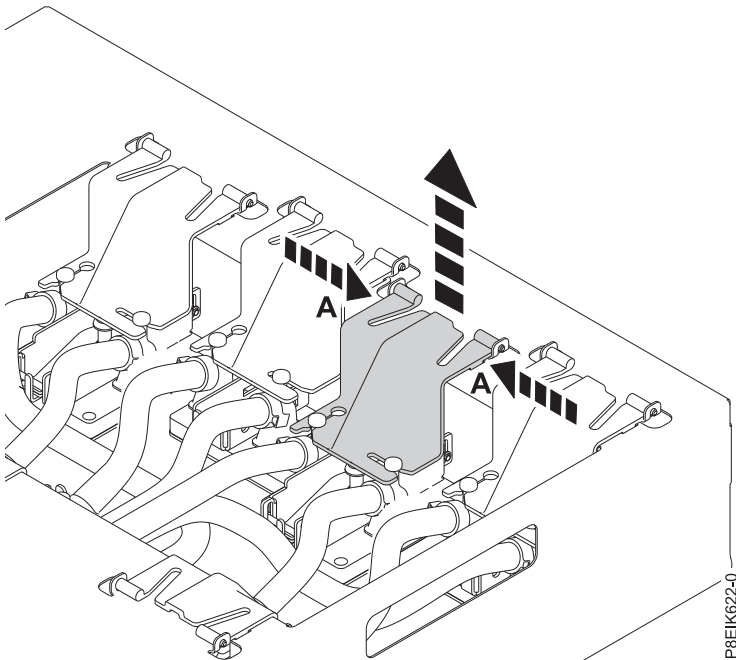
Figure 22. Removing the holder from the carrier

b. Pivot the cold plate to slide one pin from the holder as shown in Figure 23.
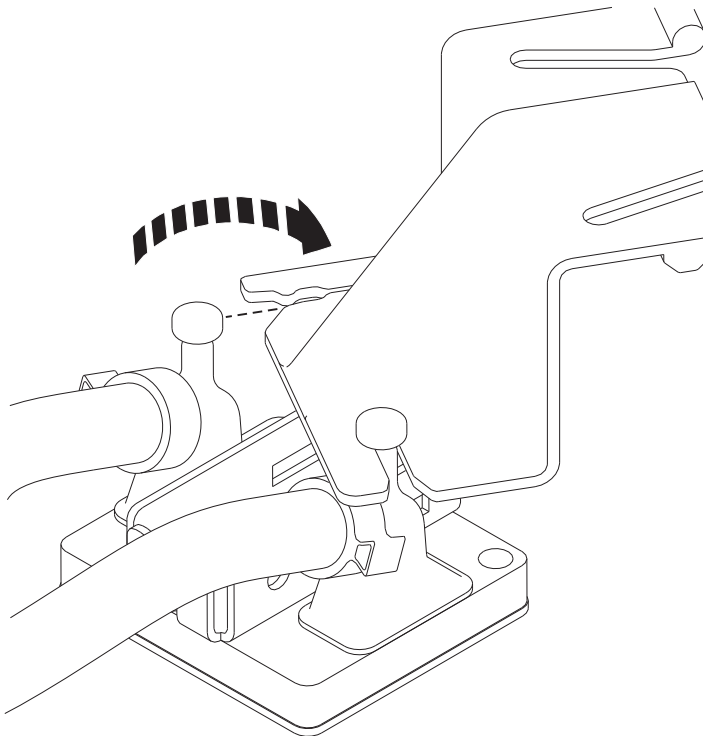
Figure 23. Removing the first cold plate pin from the holder

c. Remove the second cold plate pin from the holder as shown in Figure 24.
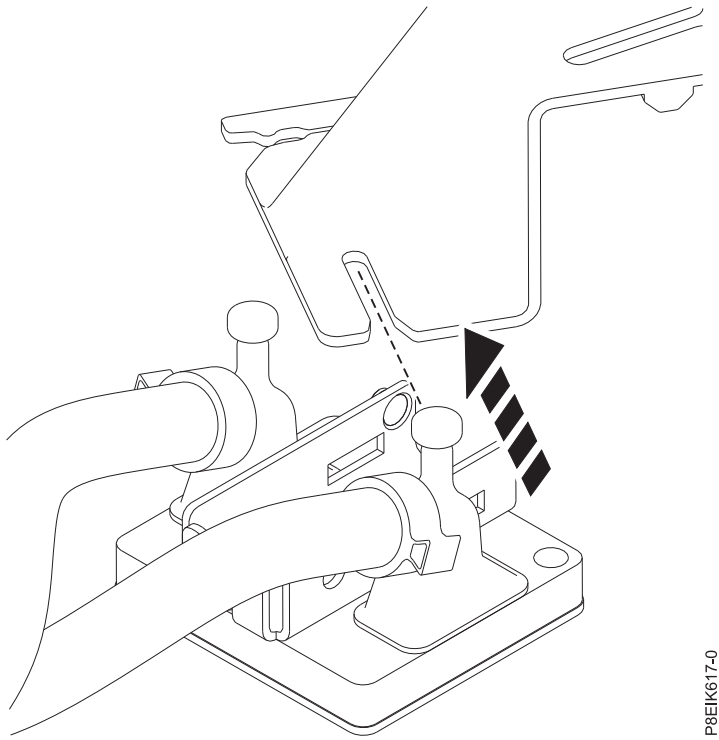
P8EIK617-0

Figure 24. Removing the second cold plate pin from the holder

d. Pinch the holder at points **(A)** and replace it onto the carrier as shown in Figure 25 on page 20.
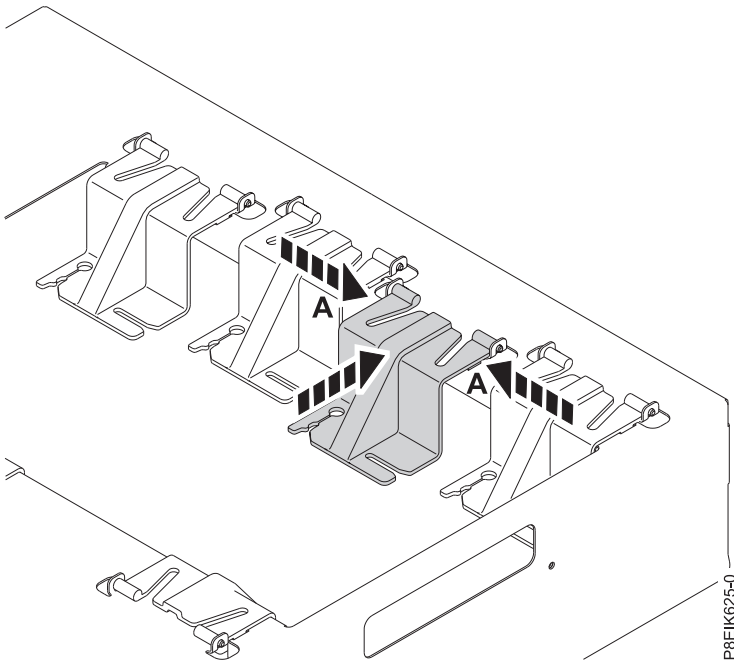
Figure 25. Replacing the holder back onto the carrier

The cold plate is resting on the work table. Repeat step 2 on page 17 for each cold plate.

3. After all the cold plates are secured to their corresponding GPU or processor module, unfasten the hook-and-loop fastener from the water hoses as shown in Figure 26 on page 21.
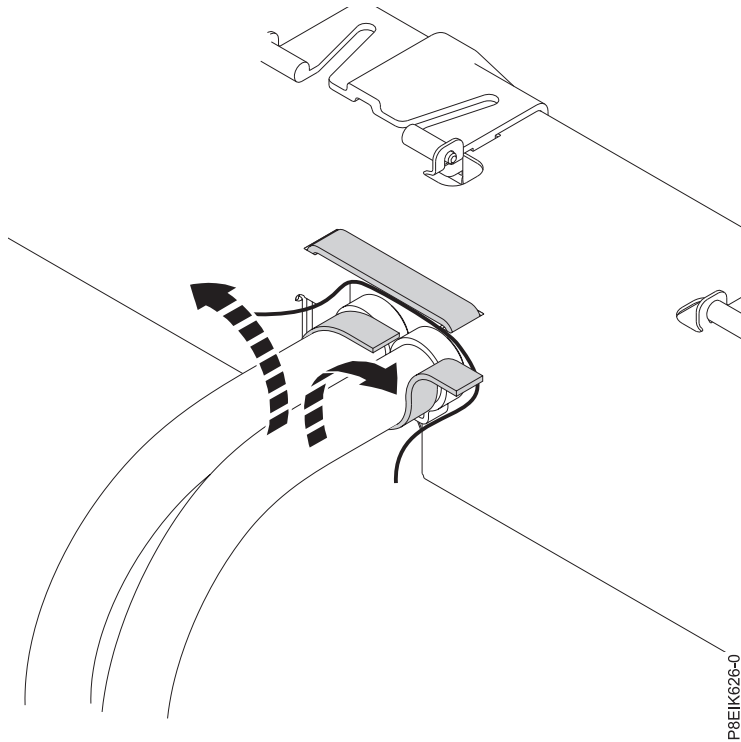
Figure 26. Unfastening the water hoses from the carrier

4. Lift the cold plate installation carrier off the faulty cold plate assembly, and place it over the replacement cold plate assembly as shown in Figure 27.
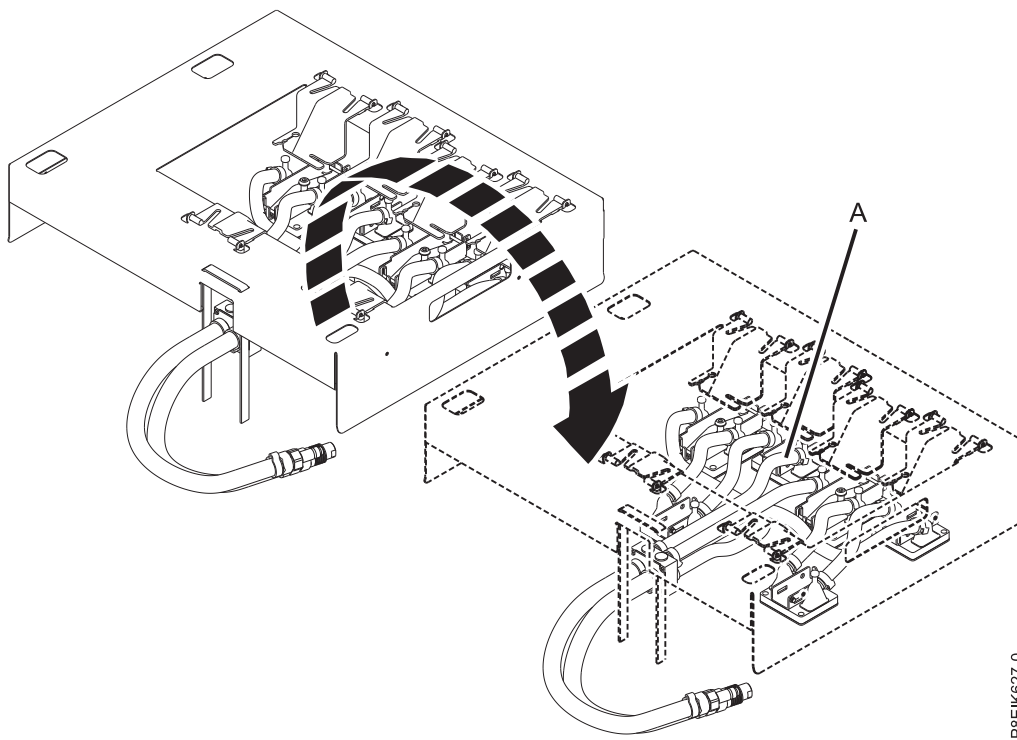
Figure 27. Moving the cold plate installation carrier over the replacement cold plate assembly

5. Using the closed-loop fasteners, secure the water hoses to the cold plate installation carrier as shown in Figure 28.
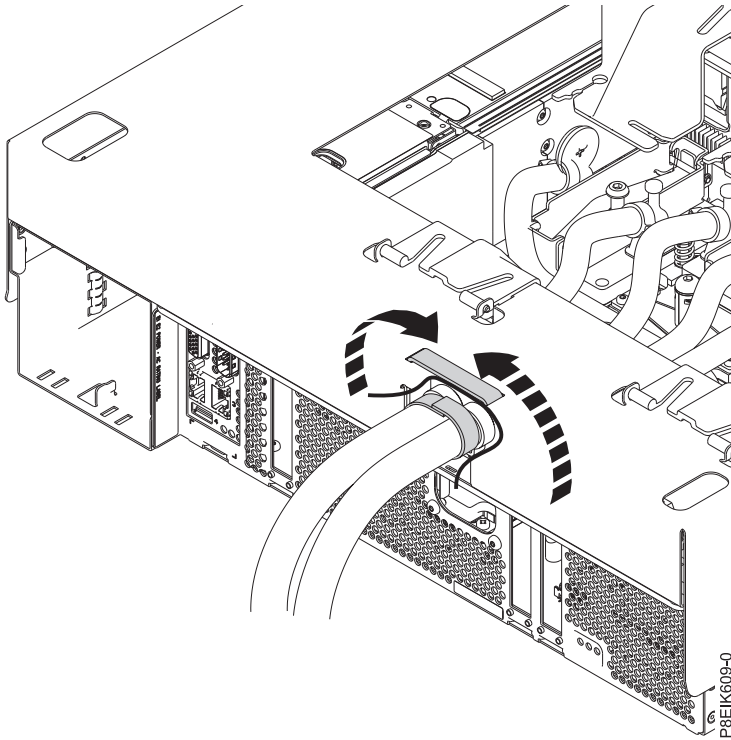
Figure 28. Fastening the water hoses to the carrier

6. Secure each cold plate to its corresponding plastic carrier.
   a. Pivot the holder up. Pinch in at the sides to remove the holder from the carrier as shown in Figure 29 on page 23.
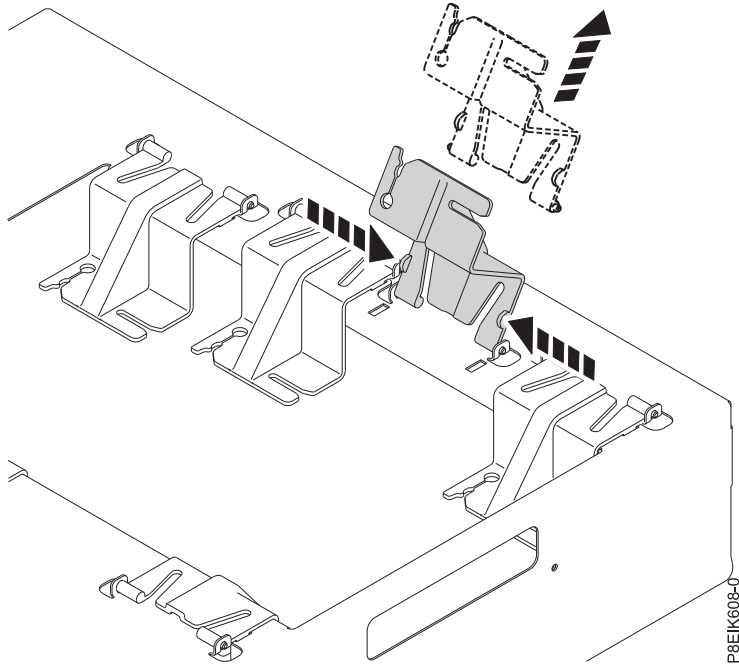
Figure 29. Removing holder from carrier

    b. Slide one cold plate pin into the holder as shown **(A)** in Figure 30. Push the pin into the slot only as far as is needed.
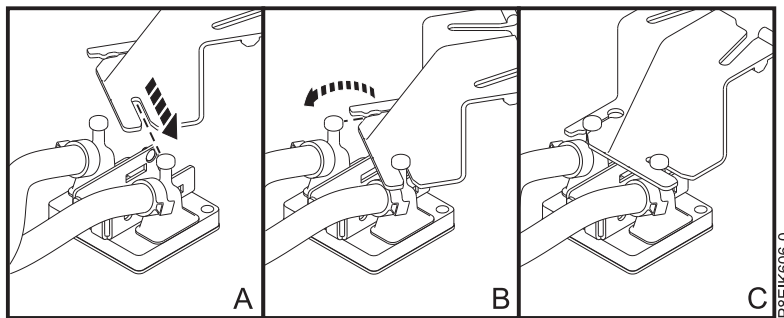
Figure 30. Inserting the cold plate pins into the holder

    c. Pivot the cold plate to slide the other pin into the holder as shown in **(B)** in Figure 30. Push the pin into the slot only as far as is needed.

    d. Pinch the holder at the sides **(B)** as shown in Figure 31 on page 24 and replace it onto the carrier.
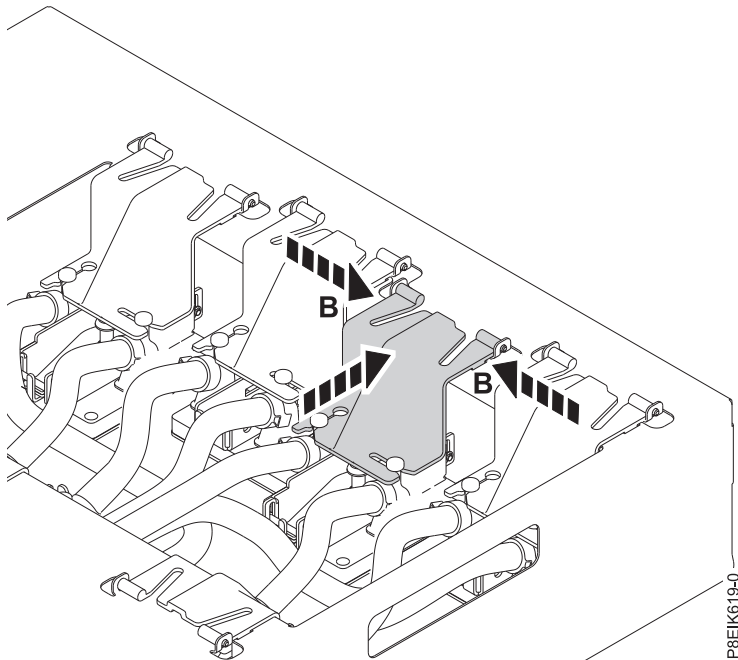
Figure 31. Replacing the holder back onto the carrier

The cold plate is secured to the carrier. Repeat step 6 on page 22 for each cold plate.

What to do next

Next, do this procedure: "Replacing the cold plates in the 8335-GTB system."

Replacing the cold plates in the 8335-GTB system

Learn how to replace the cold plates in the water-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Ensure that you have enough TIMs for the GPUs and processors.

Note: TIMs are included in the cold plate assembly kit. If you need additional TIMs, order the system processor TIM replacement kit. For information about part numbers, see 8335-GTB parts.

Procedure
1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Ensure that each GPU clip is open as shown in Figure 32 on page 25.
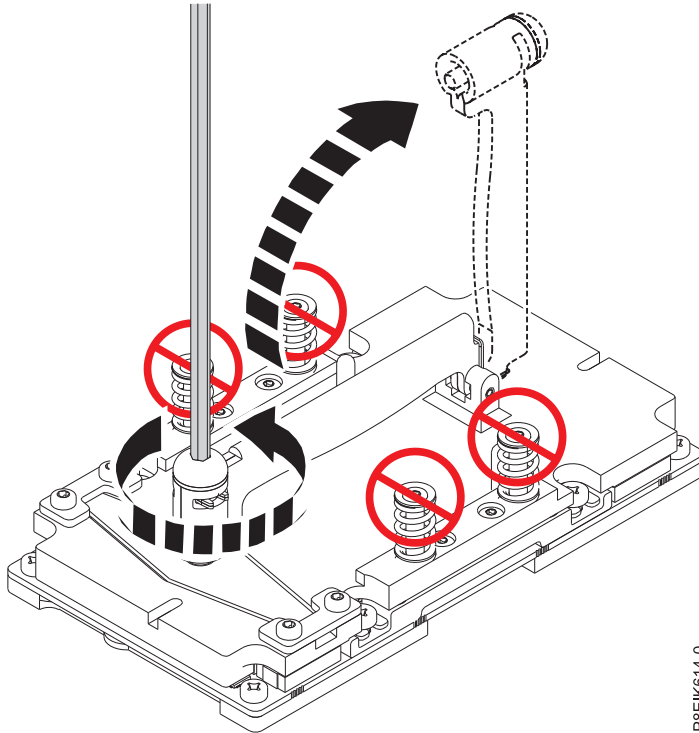
Figure 32. Open the cold plate retainer

3. You need to check the TIM heat sink material.
   - For each GPU, the TIM must be replaced.
   - For each processor, inspect the TIM material for visible signs of damage as shown in Figure 33 on page 26.

     If the TIM is damaged, use the supplied scraper to remove the TIM from the cold plate. Using the tweezers, center the new TIM onto the system processor module. The side with the red stripe must be facing up. Align the beveled edges of the TIM and the system processor module.
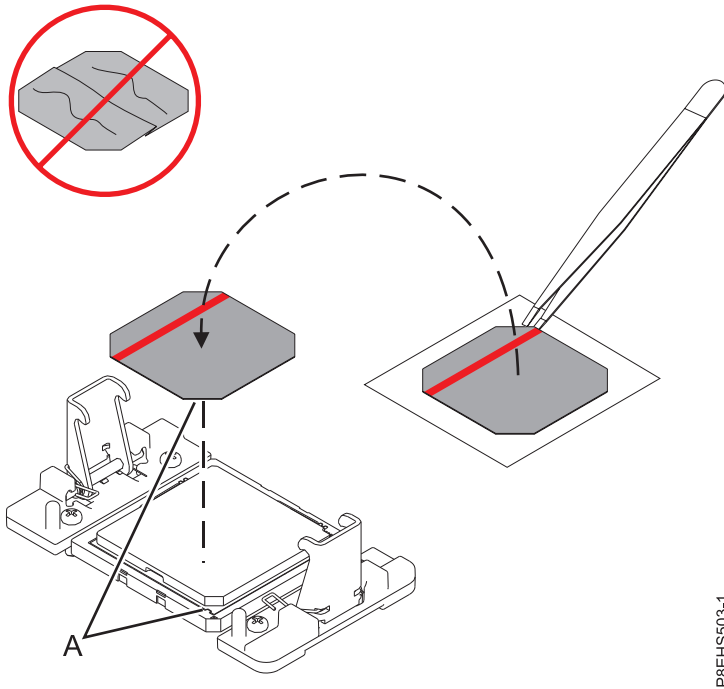
Figure 33. Installing the TIM onto the processor lid

4. Lower the cold plate installation carrier straight down onto the system as shown in Figure 34 on page 27. If you lower at an angle, the carrier catches on the cold plate clips.
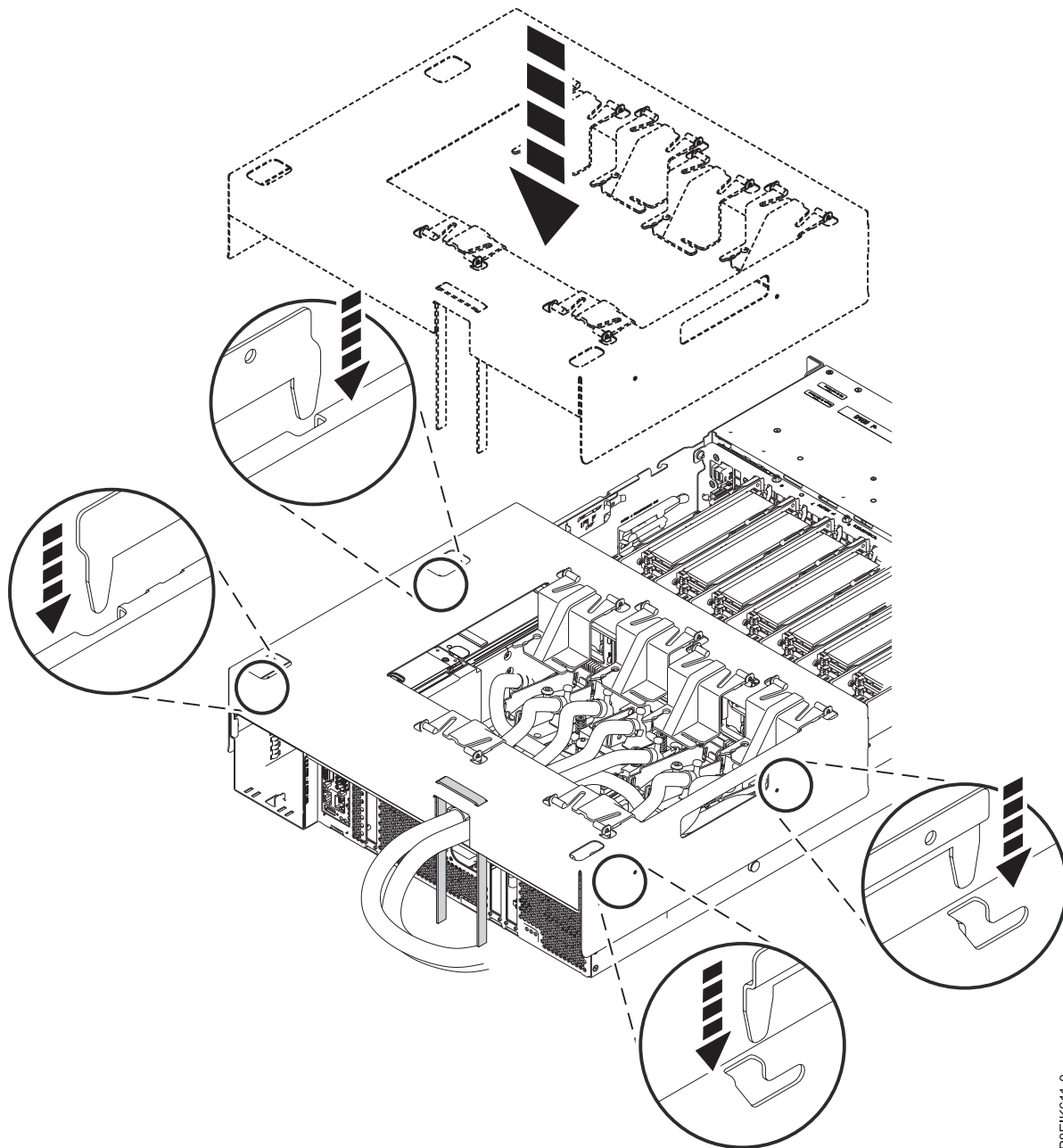
Figure 34. Lowering the cold plate installation carrier onto the system

5. One at a time, replace and secure each GPU and processor cold plate. You can begin with replacing the GPUs and processors near the front of the system.

   a. Remove a cold plate from its plastic holder. Lift and pinch the plastic holder at points **(A)** to remove it from the carrier as shown in Figure 35 on page 28.
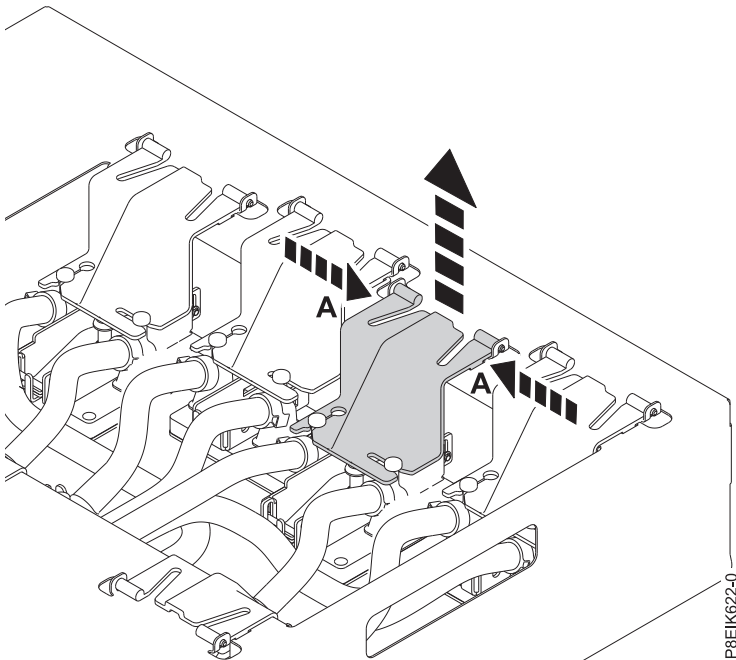
Figure 35. Removing the holder from the carrier

b. Pivot the cold plate to slide one pin from the holder as shown in Figure 36.
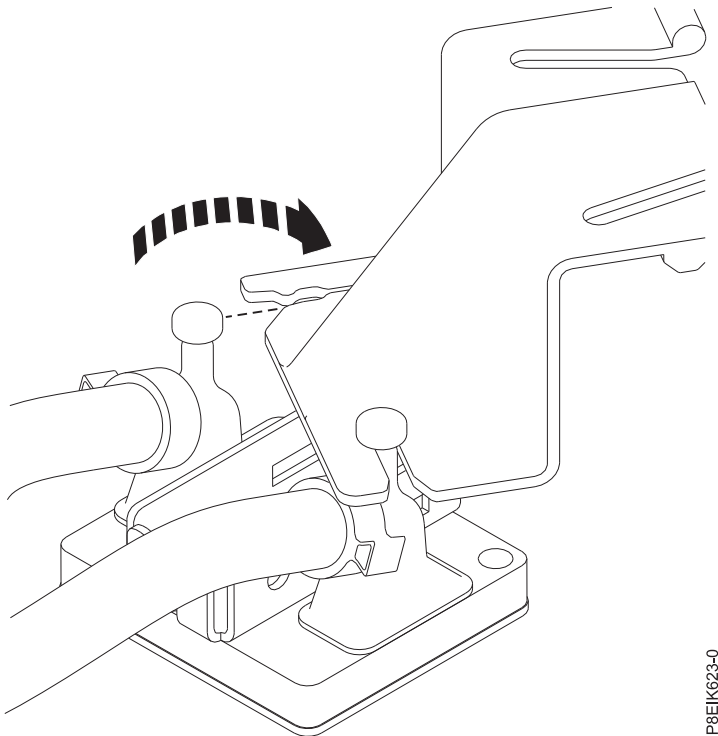
Figure 36. Removing the first cold plate pin from the holder

c. Remove the second cold plate pin from the holder as shown in Figure 37.

P8EIK617-0
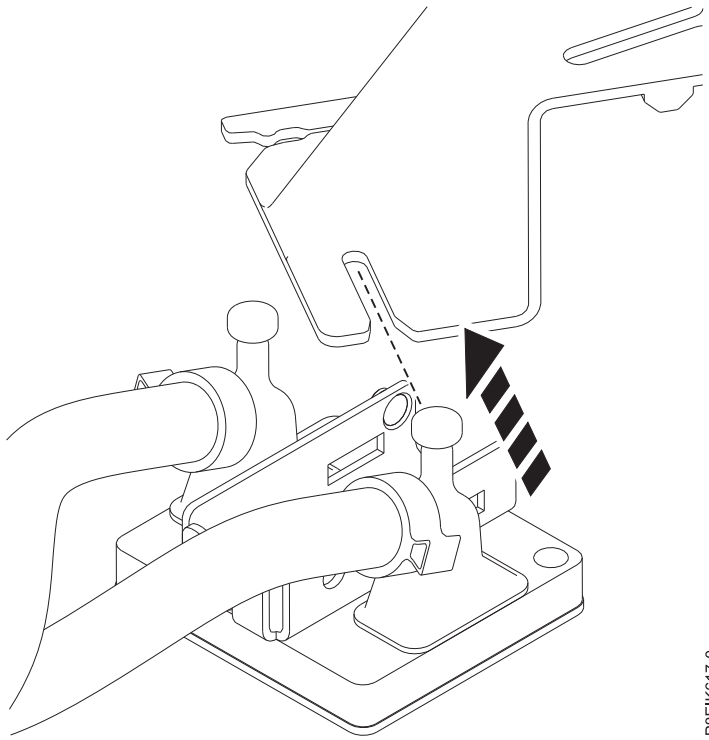
Figure 37. Removing the second cold plate pin from the holder

d. Pinch the holder at points **(A)** and replace it onto the carrier as shown in Figure 38 on page 30.
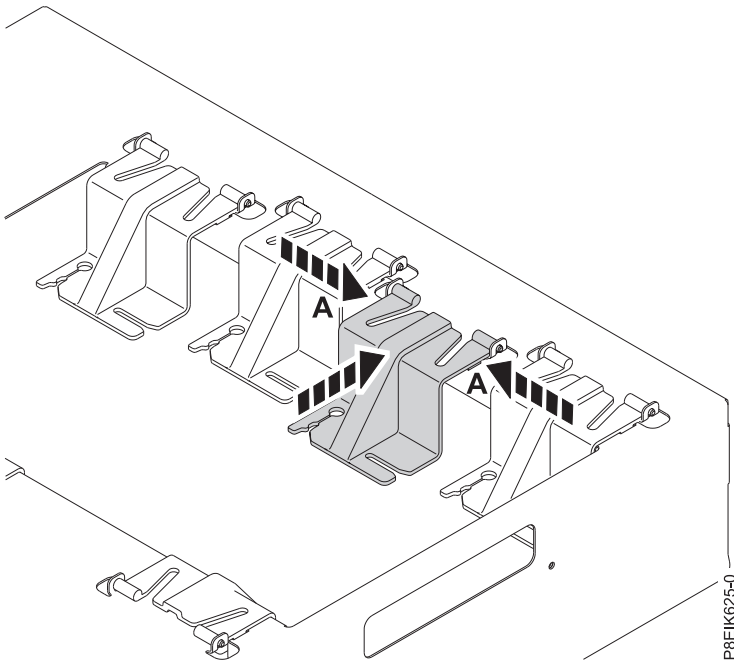
Figure 38. Replacing the holder back onto the carrier

    e. Secure the cold plate to the GPU or processor module.

       • For a GPU, swing the retainer over the GPU and tighten the cold plate retainer screw as shown in Figure 39 on page 31.
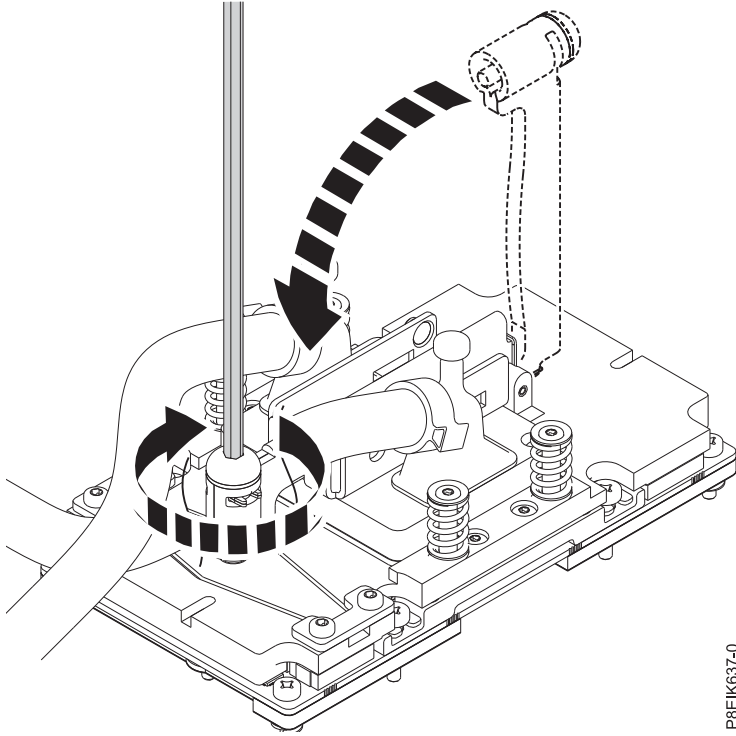
Figure 39. Secure the cold plate retainer screw

- For a processor module, tighten the cold plate retainer screw with the supplied hex key as shown in Figure 40.
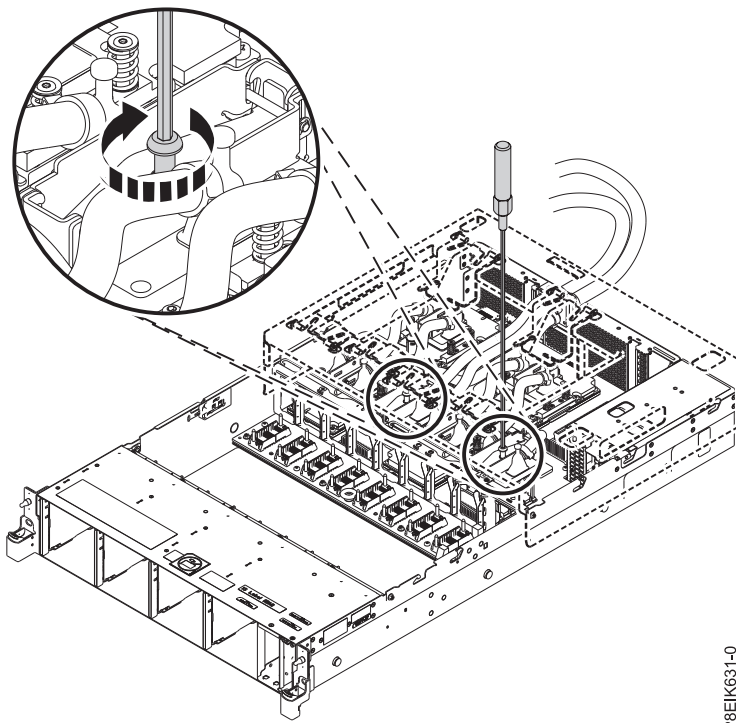
Figure 40. Tightening the cold plate retainer screw

Repeat step 5 on page 27 for each cold plate.

6. After all the cold plates are secured to their corresponding GPU or processor module, unfasten the hook-and-loop fastener from the water hoses as shown in Figure 41.
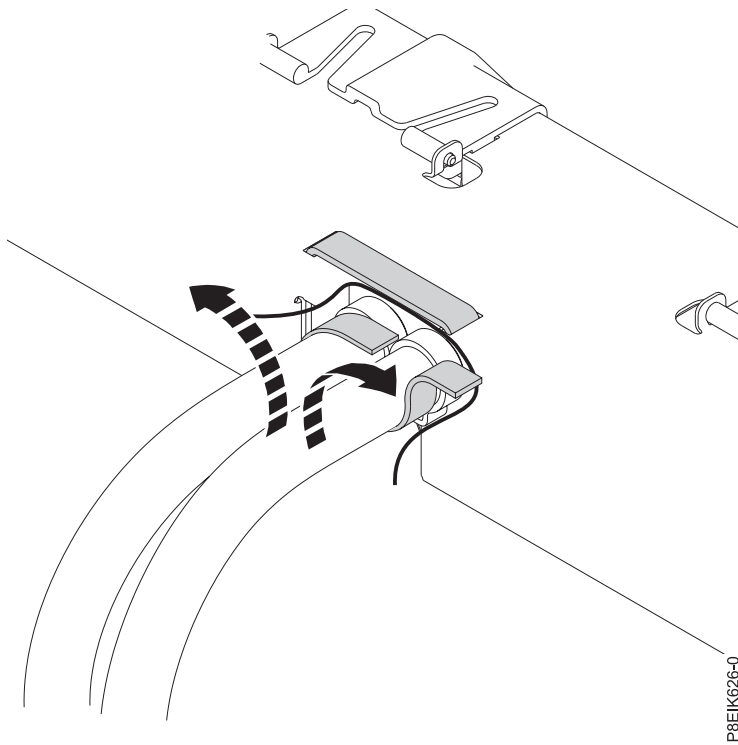
Figure 41. Unfastening the water hoses from the carrier

7. Lift the cold plate installation carrier straight up off the system as shown in Figure 42 on page 33.
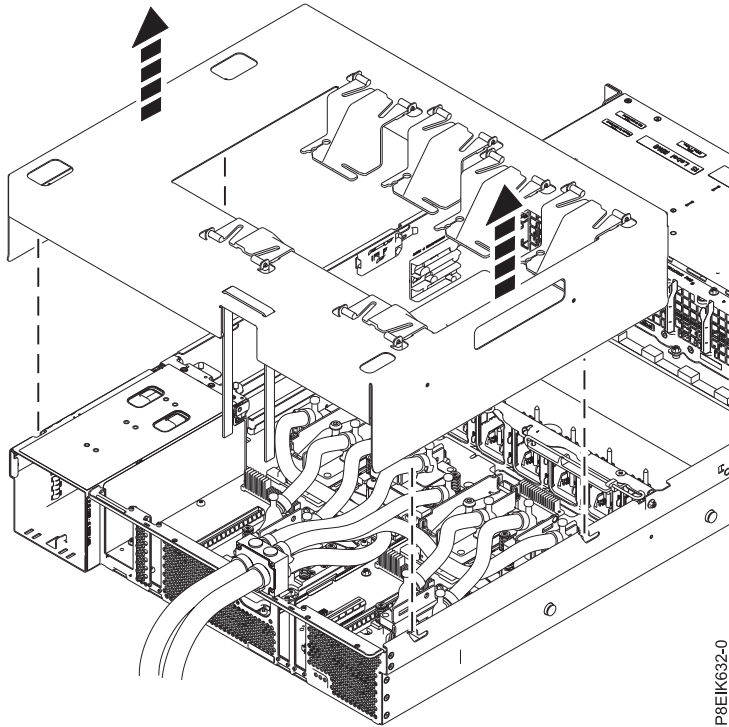
Figure 42. Lifting the cold plate installation carrier

8. Pass the hoses through the rear wall of the system as shown in Figure 43 and Figure 44 on page 34.
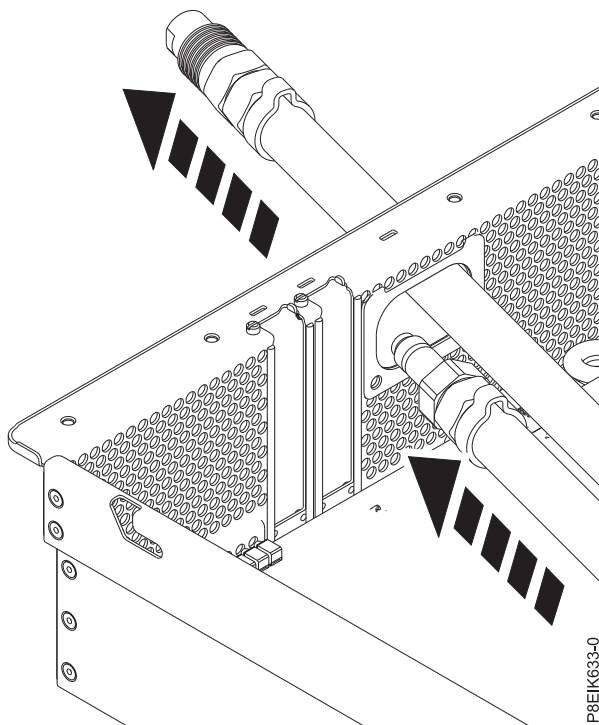
Figure 43. Passing the water connectors through the rear wall, one at a time
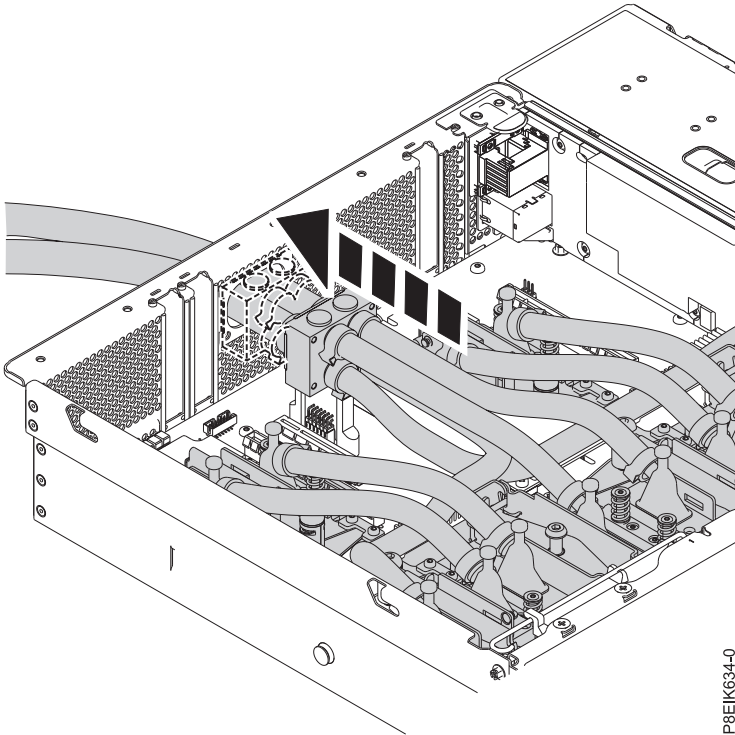
Figure 44. Replacing the hoses

9. Replace the four screws that secure the water hoses to the rear of the system as shown in Figure 45.
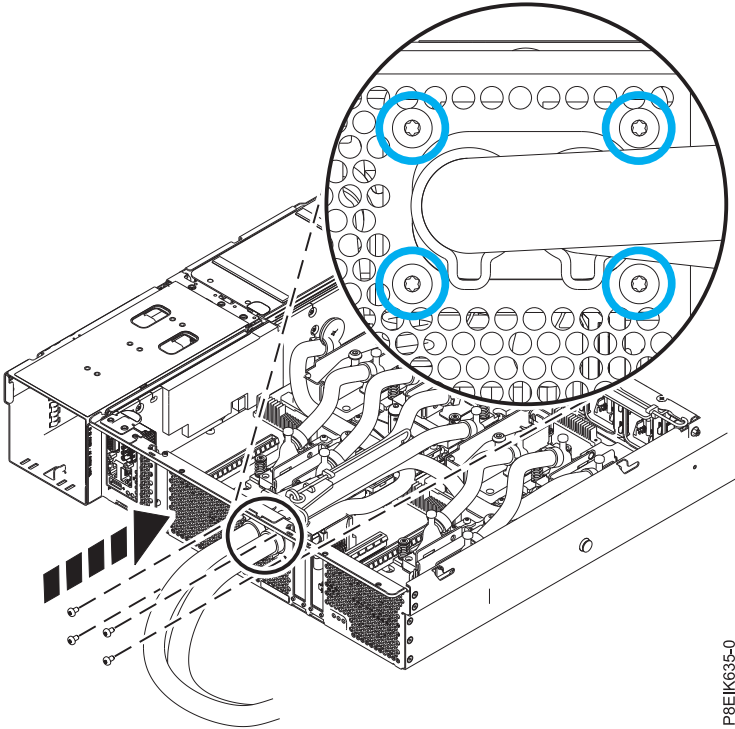
Figure 45. Replacing the rear water hose screws

10. Replace the rear cold plate service clip and secure it with its two screws as shown in Figure 46.
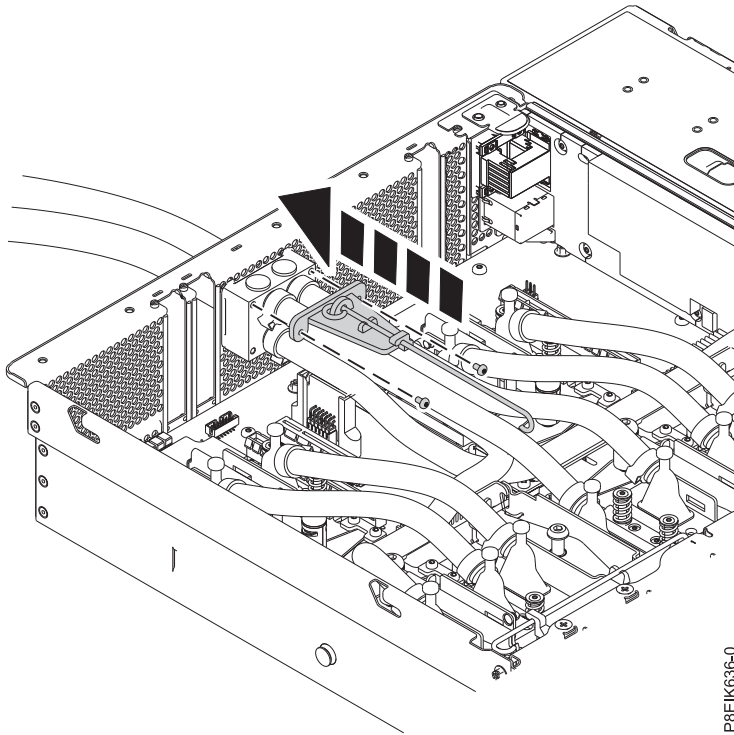
Figure 46. Replacing the rear service clip

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing a disk drive in the 8335-GTB

Learn how to remove and replace a disk drive in the IBM Power System S822LC (8335-GTB) system.

The drive might be a hard disk drive (HDD) or a solid-state drive (SSD).

Removing a disk drive from the 8335-GTB system

Follow these steps to remove a disk drive in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Remove the front cover. For instructions, see "Removing the front cover from an 8335-GTB system" on page 204.
2. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
- When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. Locate the faulty drive. The amber drive LED is turned on when a drive has an issue. If a drive has an issue and if the amber LED is not lit, use the following procedure to locate the drive.

   a. Determine which drive to replace as determined by the operating system. For example, the drive might be referenced as sda or sdb.

      Attention: The operating system is typically on sda. Do not continue with removing the drive with the power on unless sda is part of a RAID configuration. If the drive contains the operating system, needs to be removed, and is not part of a RAID array, you need to first power down the system.

   b. Disable the drive to prepare for removal with the following command, where sdX is the drive to replace.

      `sh –c "echo 0 >/sys/block/sdX/device/delete"`

   c. Verify that you disabled the drive from writing by using the lsscsi command. The drive should no longer appear in the output.

      `lsscsi`

   d. Gather the physical serial number of the identified drive with the following command, where sdX is the drive to replace:

      `hdparm –i /dev/sdX | grep –i serial`

   e. Run the following command to identify the physical drive, where sdX is the drive to replace:

      `dd if=/dev/sdX of =/dev/null`

      The green LED on the drive flashes.

      You can also use the optional ledmon package turn the identify LED on or off. Run this command to turn on the LED, where sdX is the drive to replace:

      `ledctl locate=/dev/rssdX`

      Run this command to turn off the LED:

      `ledctl locate_off=/dev/rssdX`

4. Unlock the drive bay handle **(B)** by pushing the handle release **(A)** up. The handle **(B)** snaps out towards you. If the handle does not snap out all the way, the drive does not slide out of the system. See Figure 47 on page 37.
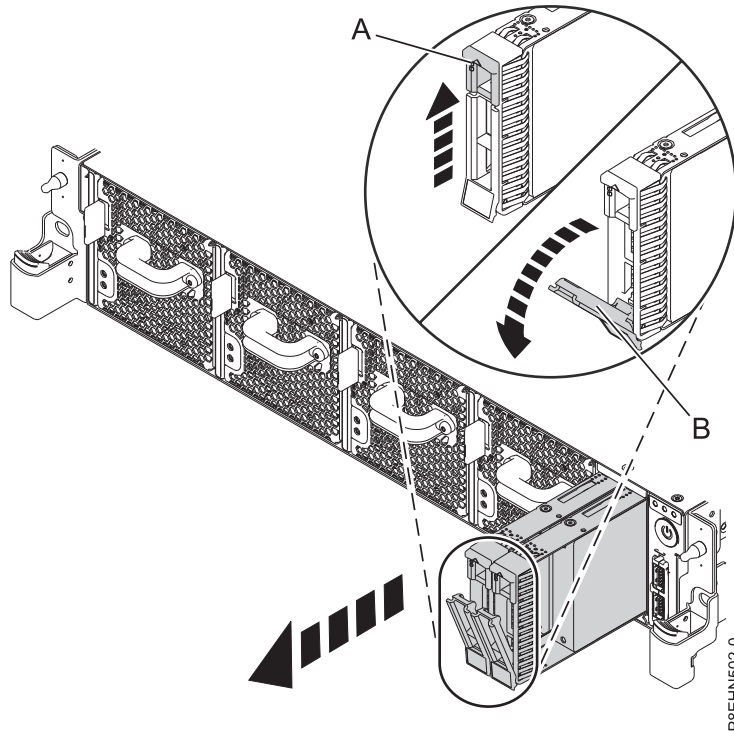
Figure 47. Disk drive lock detail

5. Support the bottom of the drive as you slide it out of the system. Do not hold the drive by the handle.
6. If you are removing more than one drive, repeat the steps in this procedure until all drives are removed.

Replacing a disk drive from the 8335-GTB system

Follow these steps to replace a disk drive in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Hold the drive by the top and bottom edges as you position the drive, and insert it into the drive slot.

   Important: Ensure that the drive is fully seated and is all the way into the system.
3. Lock the drive bay handle **(A)** by pushing in the handle release. See Figure 48 on page 38.
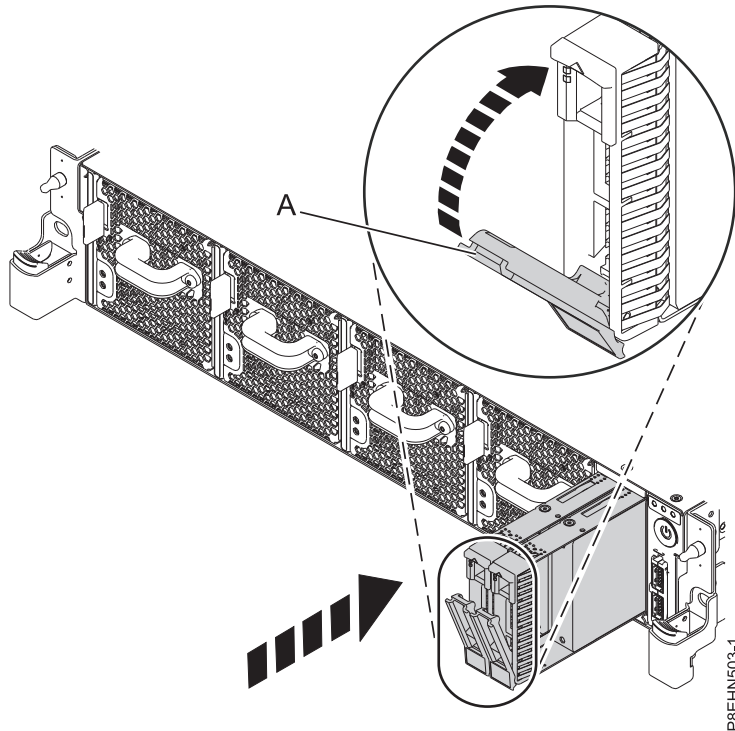
Figure 48. Disk drive lock detail

4. Configure the installed drive for your environment.

   After you insert the new drive, you need to rescan for the device.

   - **Ubuntu Linux operating system**: To run the **rescan-scsi-bus** command in the Ubuntu Linux operating system, log in to the system as the root user, and run the following command:

     rescan-scsi-bus

     The **rescan-scsi-bus** tool is available in the *scsitools* package; install the package by using the following command:

     sudo apt-get install scsitools

   - **Red Hat Enterprise Linux (RHEL) version 7.2**: To run the rescan command in the REHL version 7.2 operating system, log in to the system as the root user, and run the command:

     rescan-scsi-bus.sh -a

     The **rescan-scsi-bus** tool is available in the *sg3_utils* package; install the package by using the following command:

     yum install sg3_utils

     You may also want to refer to: Adding a Storage Device or Path (https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Storage_Administration_Guide/adding_storage-device-or-path.html)

   Verify that the new drive is active with the following command:

   lsscsi

5. Load or restore data from your backup media.

Removing and replacing the disk drive and fan card in the 8335-GTB

Learn how to remove and replace the disk drive and fan card in the IBM Power System S822LC (8335-GTB) system.

Removing the disk drive and fan card from the 8335-GTB

To remove the disk drive and fan card from the IBM Power System S822LC (8335-GTB) system, complete the steps in this procedure.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. Label and remove each memory riser. Record their location to ensure they are replaced in the same position during the replacement steps. For instructions, see "Removing memory risers from the 8335-GTB" on page 75.

3. Label and remove the power cable from the disk drive and fan card. For instructions, see "Removing the disk drive and fan card from the 8335-GTB."

4. Label and remove the disk drive fan signal cable from the disk drive and fan card. For instructions, see "Removing the disk and fan signal cable from the 8335-GTB system" on page 43.

5. Remove the fans. For instructions, see "Removing a system fan from the 8335-GTB" on page 46.

6. Label and remove the disk drives and any fillers. For instructions, see "Removing a disk drive from the 8335-GTB system" on page 35.

7. Remove five screws from the top of the disk drive and fan card. Figure 49 on page 40 shows all 12 screw locations.
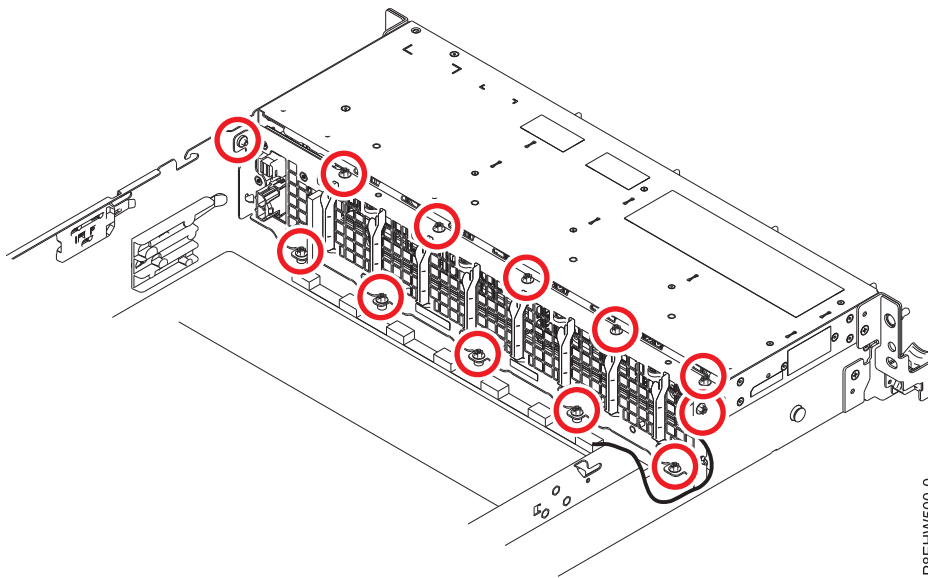
Figure 49. Screw locations for the disk drive and fan card

8. Remove five screws from the bottom of the disk drive and fan card.
9. Remove one screw from each side of the disk drive and fan card.
10. The disk drive and fan card **(A)** is aligned in the system by using two pins **(B)**. Pivot the disk drive and fan card away from the fan housing around the pins; then, lift out the card.
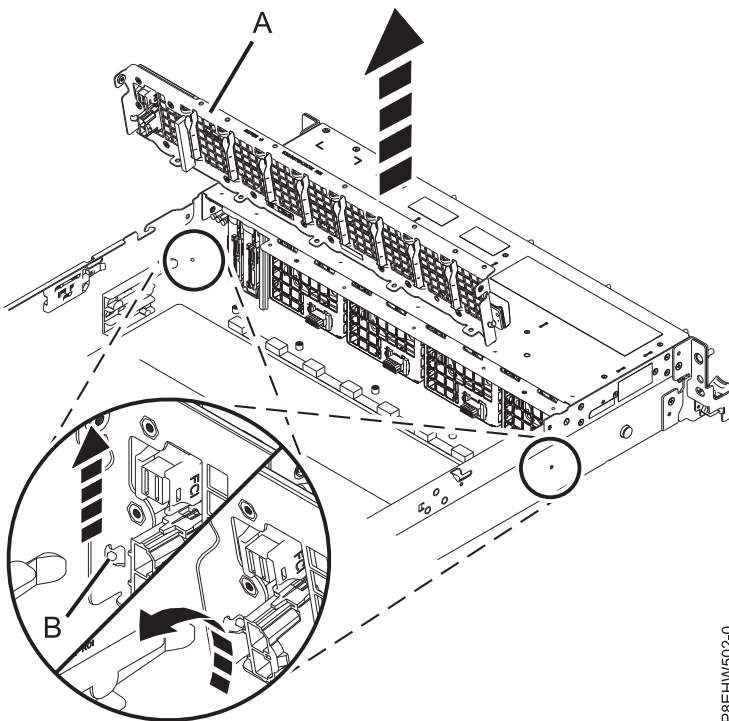
Figure 50. Removing the disk drive and fan card

11. Place the disk drive and fan card on the table.

Replacing the disk drive and fan card in the 8335-GTB

To replace the disk drive and fan card in the IBM Power System S822LC (8335-GTB) system, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Remove the replacement disk drive and fan card from the protective plastic envelope.

3. Using the alignment pins (one on each side) **(A)** for the disk drive and fan card **(B)**, lower and pivot the card into place. See Figure 51.

   Note: Both the front USB cable and the power switch cable **(A)** need to be located in the recessed area **(B)** of the disk drive and fan card. If they are not located in that recessed area, they can be pinched and damaged. See Figure 52 on page 42.
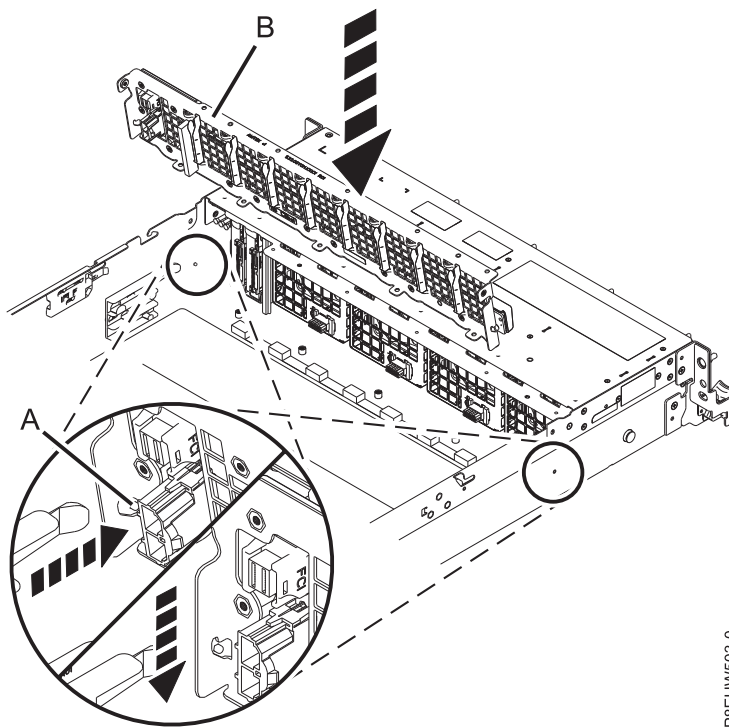
Figure 51. Inserting the disk drive and fan card
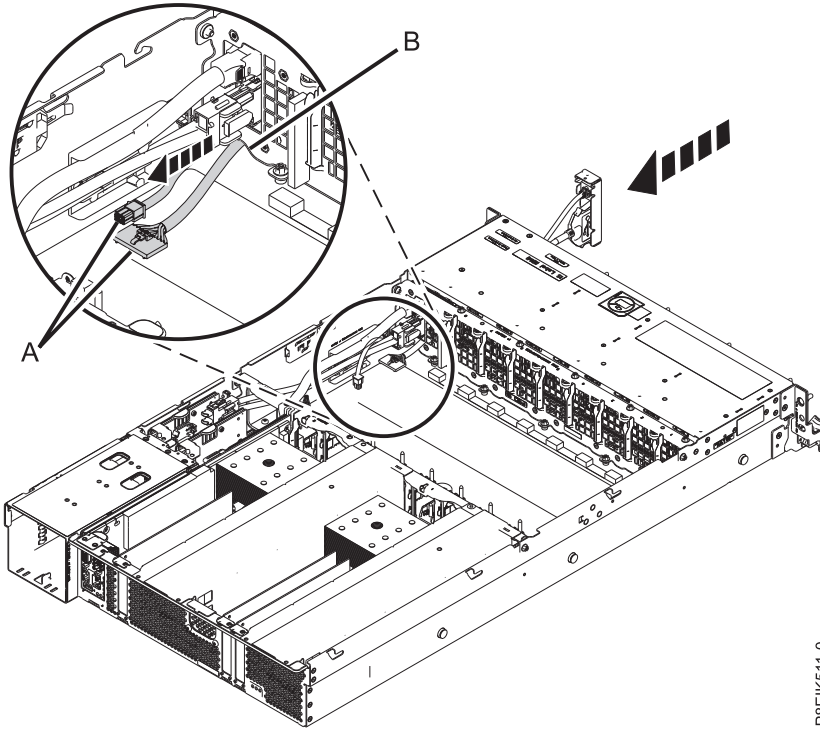
Figure 52. Routing the cables under the disk drive and fan card

4. Replace five screws for the bottom of the disk drive and fan card. Figure 53 shows all 12 screw locations.
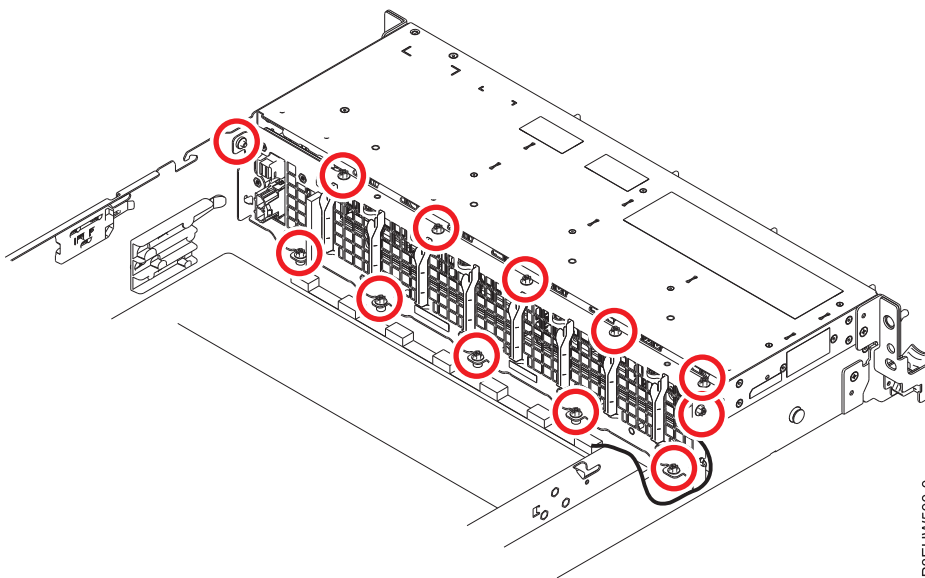
Figure 53. Screw locations for the disk drive and fan card

5. Replace five screws for the top of the disk drive and fan card.
6. Replace one screw in each side of the disk drive and fan card.
7. Using your labels, replace the disk drives and any fillers. For instructions, see "Replacing a disk drive from the 8335-GTB system" on page 37.
8. Replace the fans. For instructions, see "Replacing a system fan in the 8335-GTB" on page 47.

9. Using your label, plug the disk drive fan signal cable into the disk drive and fan card. For instructions, see "Replacing the disk and fan signal cable in the 8335-GTB system" on page 45.

10. Using your label, plug the power cable into the disk drive and fan card. For instructions, see "Replacing the 8335-GTB fan power cable" on page 51.

11. Using your labels, replace the memory risers. For instructions, see "Replacing memory risers in the 8335-GTB" on page 77.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the disk and fan signal cable in the 8335-GTB

Learn how to remove and replace a disk and fan signal cable in the IBM Power System S822LC (8335-GTB) system.

Removing the disk and fan signal cable from the 8335-GTB system

Follow these steps to remove the disk and fan signal cable from the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. Locate the disk and fan signal cable **(A)**. It connects from the system backplane to the disk drive and fan card, along the inside of the system. See Figure 54 on page 44.
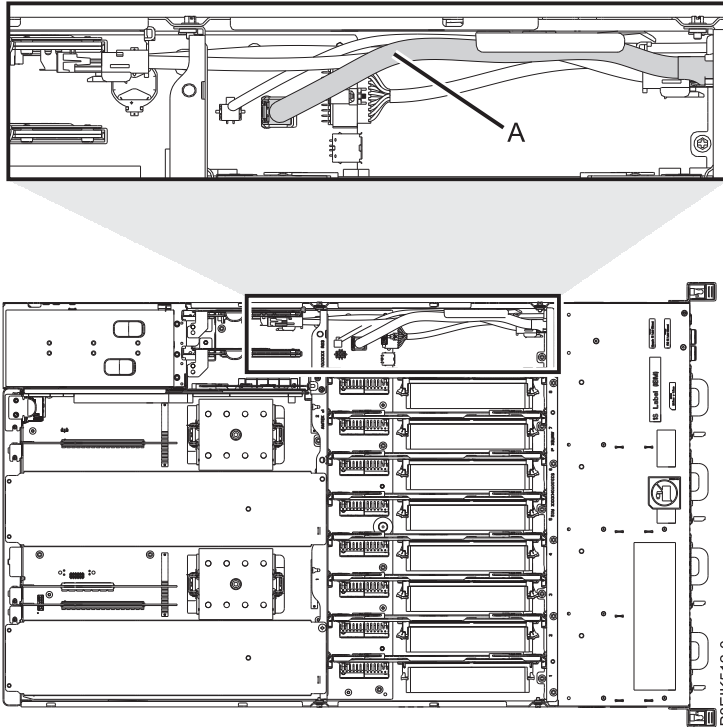
Figure 54. Location of the disk and fan signal cable and connectors

3. Release the cable from the retaining clip on the inside wall of the system.
4. Label and disconnect the disk and fan signal cable **(A)** from the disk drive and fan card **(B)** and from the system backplane **(C)**. Using your thumb, press the release latch on the connector to remove a cable. See Figure 55 on page 45.
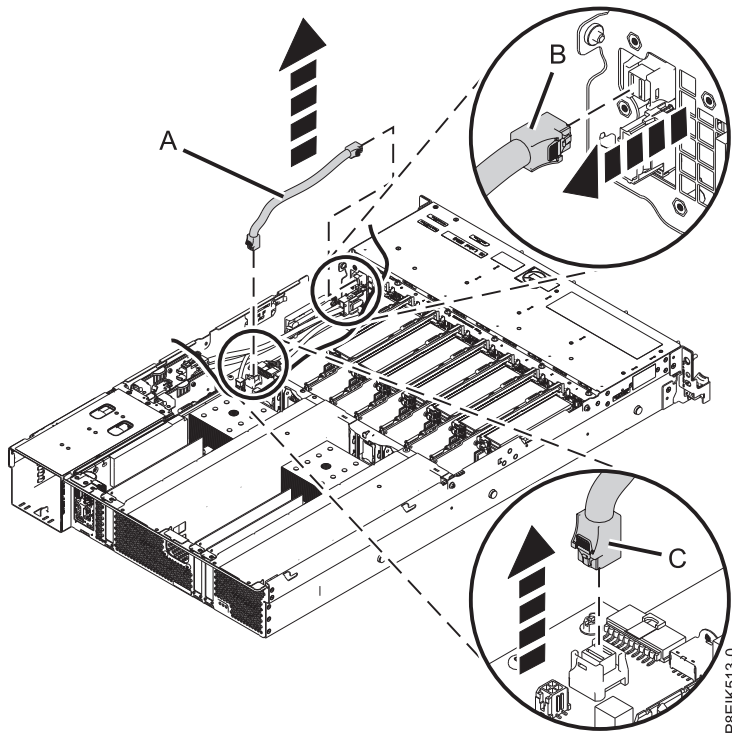
Figure 55. Removing the disk and fan signal cable

5. Place the cable on the table.

Replacing the disk and fan signal cable in the 8335-GTB system

Follow these steps to replace a disk and fan signal cable in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Using the labels, connect the disk and fan signal cable **(A)** to the disk drive and fan card **(B)** and to the system backplane **(C)**. Ensure that the cable latch clip snaps into place on the connectors. See Figure 56 on page 46.
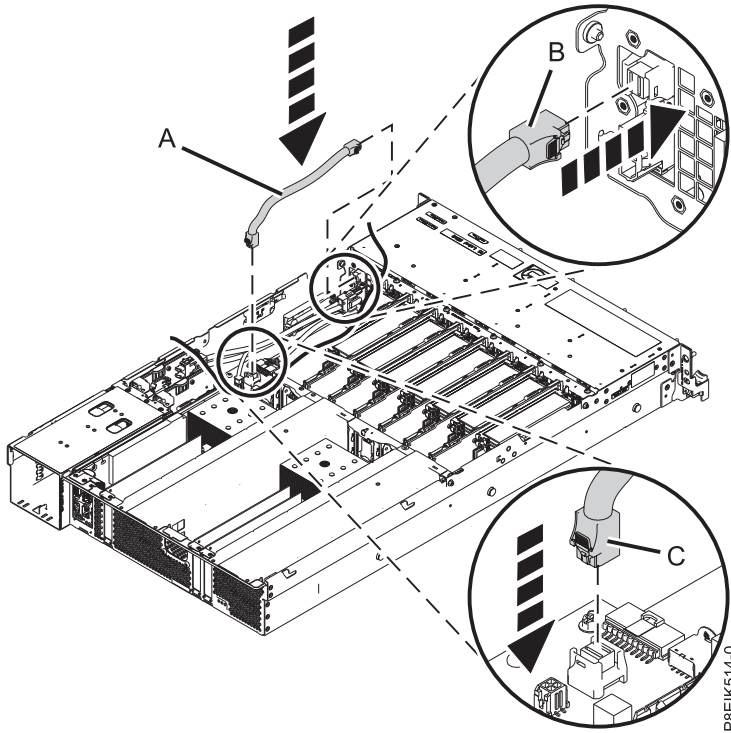
Figure 56. Replacing the disk and fan signal cable

3. Secure the cable in the retaining clip on the inside wall of the system.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing fans in the 8335-GTB

Learn how to remove and replace the fans in the IBM Power System S822LC (8335-GTB) system.

Removing a system fan from the 8335-GTB

Learn how to remove the fans in the IBM Power System S822LC (8335-GTB) system.

About this task

Attention: If you are replacing a fan with the system power turned on, you must replace the failed fan within 5 minutes to avoid a system shutdown.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. To unseat the fan from its position in the system, press in the terracotta locking-tab **(A)** as shown in Figure 57.
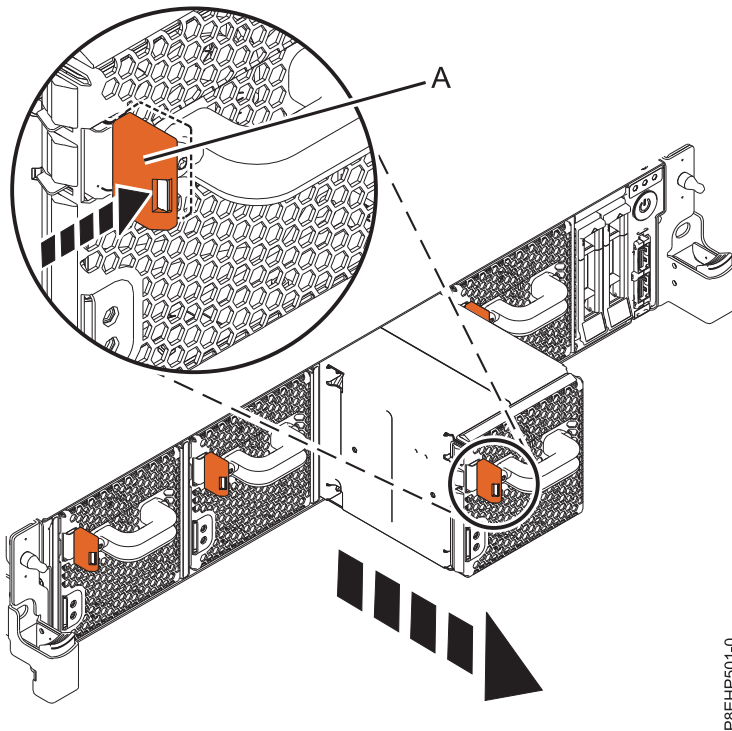
Figure 57. Removing a fan from the system

3. While you hold onto the fan handle and use your hand to support the bottom of the fan, pull out the fan from its slot.

Replacing a system fan in the 8335-GTB

Learn how to replace the fans in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Using your hand to support the bottom of the fan, align the fan **(A)** with the fan slot and slide it into the system until the terracotta tab **(A)** locks in place as shown in Figure 58 on page 48.
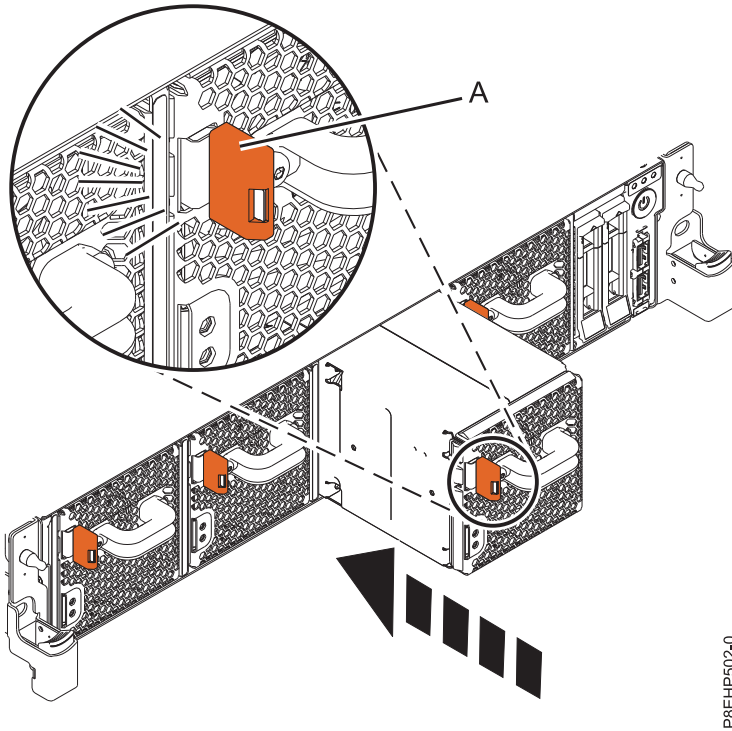
Figure 58. Replacing a fan in the system

Removing and replacing the fan power cable in the 8335-GTB

Learn how to remove and replace the fan power cable in the IBM Power System S822LC (8335-GTB) system.

Removing the fan power cable from the 8335-GTB

Learn how to remove the fan power cable in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   • Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   • When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the power riser air baffle. Using the blue tabs **(A)**, unsnap the baffle and lift it from the system. See Figure 59.

Figure 59. Removing the power riser air baffle

3. Locate where the fan power cable is connected. See **(A)** in Figure 60 on page 50.
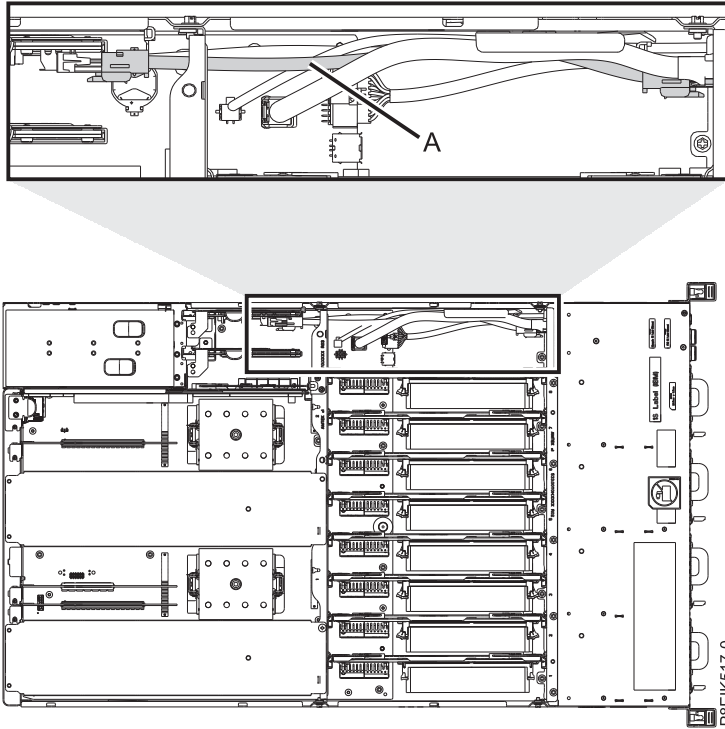
Figure 60. Location of the fan power cable and connectors

4. Grasp the connector end of the fan power cable that is connected to the power riser. See **(A)** in Figure 61 on page 51.
5. While you press the latch release lever with your thumb, disconnect the cable from the connector.
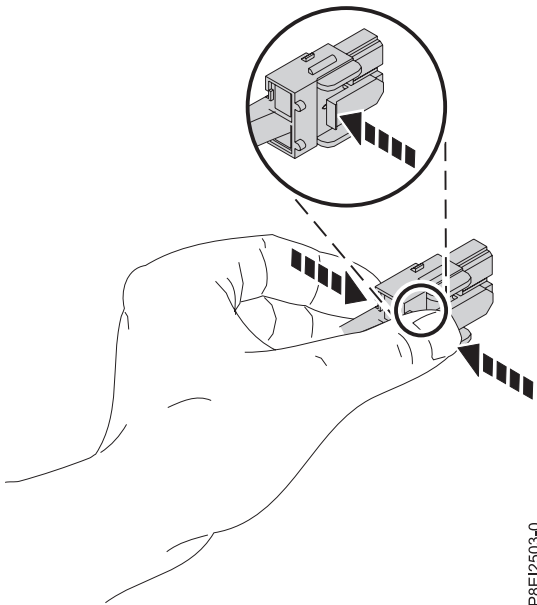
Note: The latch release on the connector must be depressed before you unplug the cable. Failure to do so might damage the cable and the connector.

6. Guide the cable end out through the opening towards the rear of the power riser.
7. Disconnect the fan power cable connector end from the disk drive and fan card.

8. Lift to remove the fan power cable. Be careful to ensure that the ends of the cable do not catch on any components as you remove it.
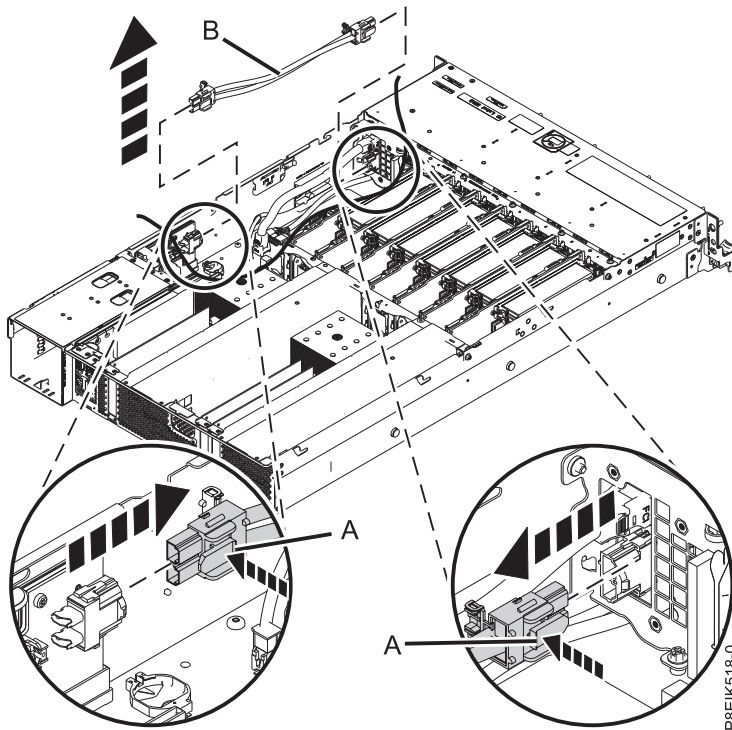
Figure 61. Removing the fan power cable from the system

Replacing the 8335-GTB fan power cable

Learn how to replace the fan power cable in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Route the fan power cable **(A)** connector end through the opening and connect it to the power riser as shown in Figure 62 on page 52. Ensure that the cable latch clip snaps into place on the connectors.
3. Connect the other end of the fan power cable into the disk drive and fan card as shown in Figure 62 on page 52.
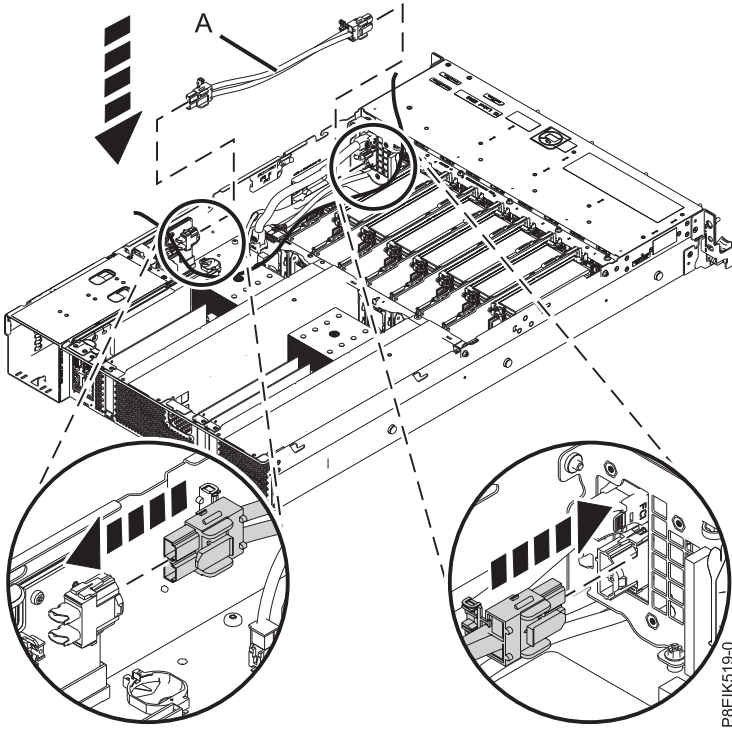
Figure 62. Installing the fan power cable

4. Install the power riser air baffle. Ensure that the holes in the baffle align with the pins on the system. Using the blue tabs **(C)**, insert the edge **(A)** of the baffle into the side of the system **(B)**. Then snap the baffle down into place. See Figure 63.
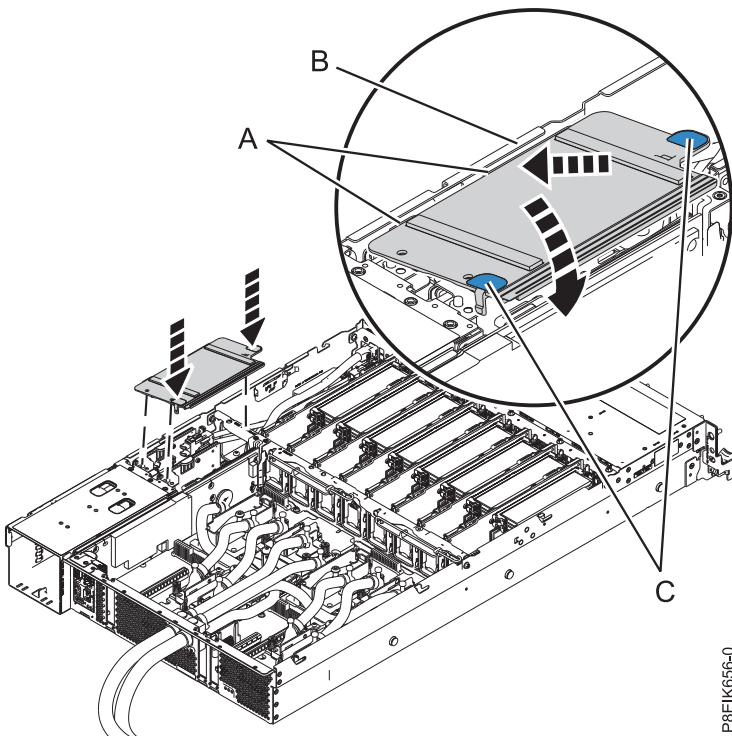
Figure 63. Installing the power riser air baffle

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the front USB cable and connector in the 8335-GTB

Learn how to remove and replace the front USB cable and connector in the IBM Power System S822LC (8335-GTB) system.

Removing the front USB cable and connector in the 8335-GTB

Learn how to remove and replace the front USB cable and connector in the IBM Power System S822LC (8335-GTB) system.
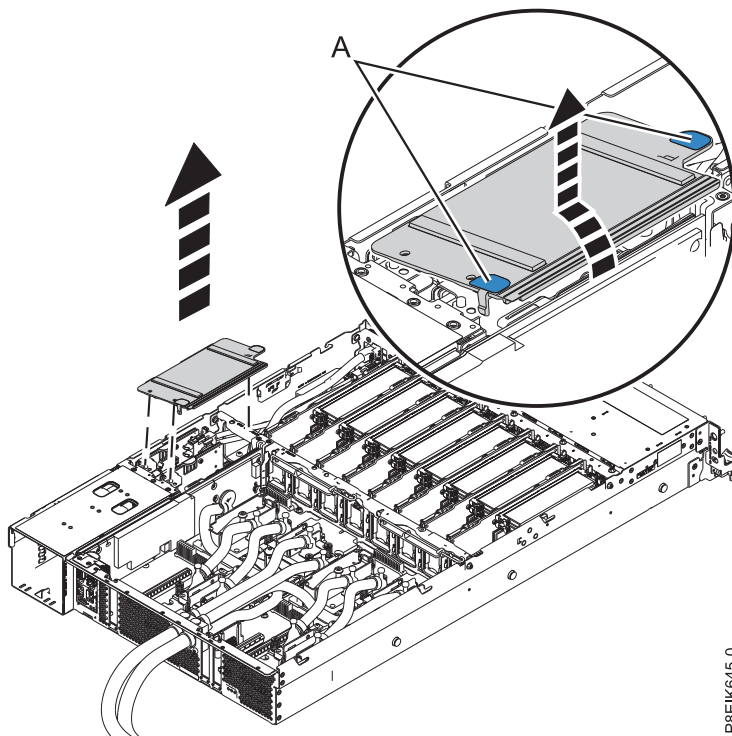
Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the disk drive and fan card. For instructions, see "Removing the disk drive and fan card from the 8335-GTB" on page 39.

3. Locate the front USB cable and connector **(A)** and the power switch and cable **(B)**. They connect between the system backplane and the power switch along the inside of the system. See Figure 64 on page 54. Label each cable.
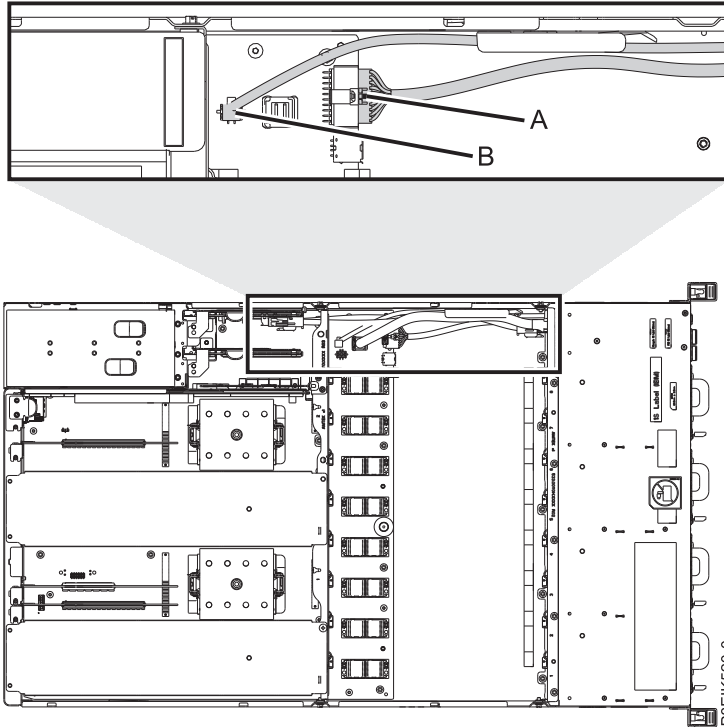
Figure 64. Location of the connectors for the front USB cable and connector and the power switch and cable

4. Release each cable from the retaining clip on the inside wall of the system.

5. Pressing the latch release on the connector, disconnect the front USB cable **(A)**. See Figure 65 on page 55.

   Note: The latch release on the connector must be depressed before you unplug the cable. Failure to do so might damage the cable and the connector.
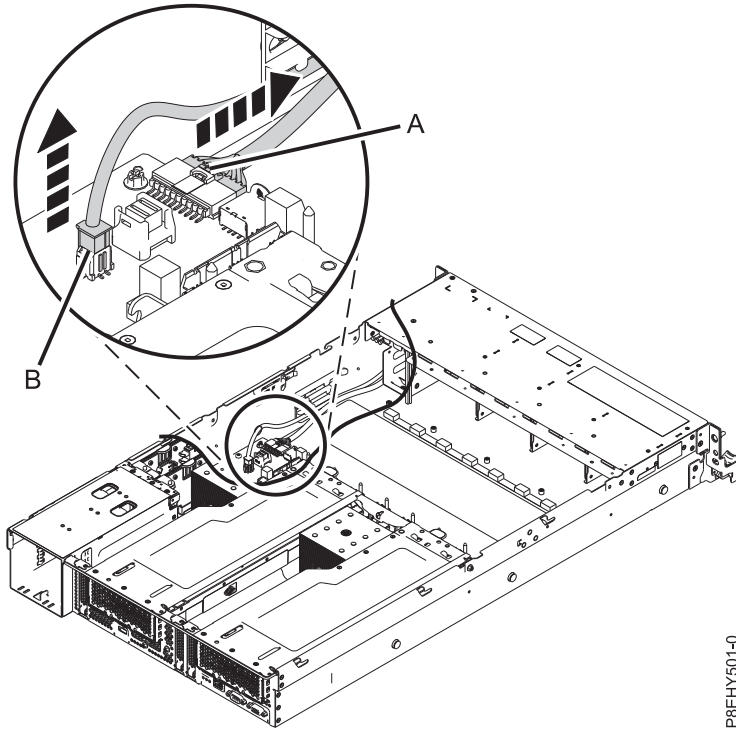
Figure 65. Removing the front USB cable and the power switch and cable from the system backplane and the disk drive and fan card

6. Pressing the latch release on the connector, disconnect the power switch and cable **(B)** from the system backplane. See Figure 65.

7. Remove the rack installation support from the side of the system. See Figure 66
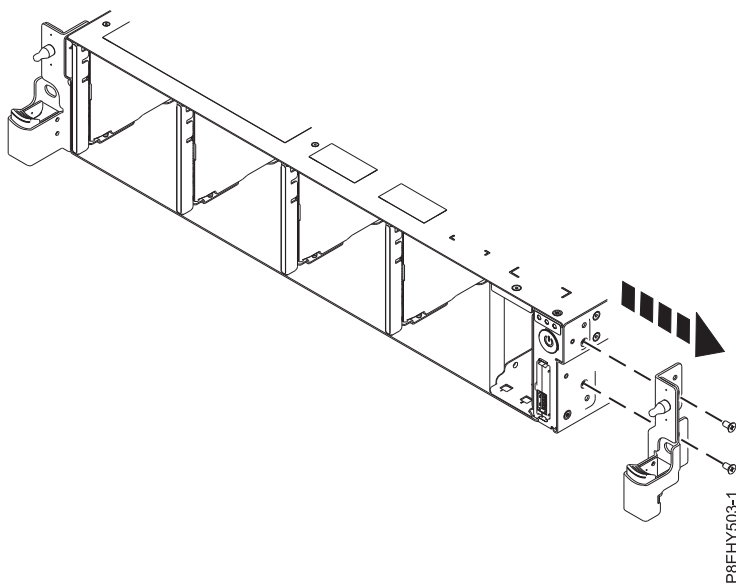
Figure 66. Removing the rack installation support

8. Remove the top and side screws from the power switch. See Figure 67 on page 56.
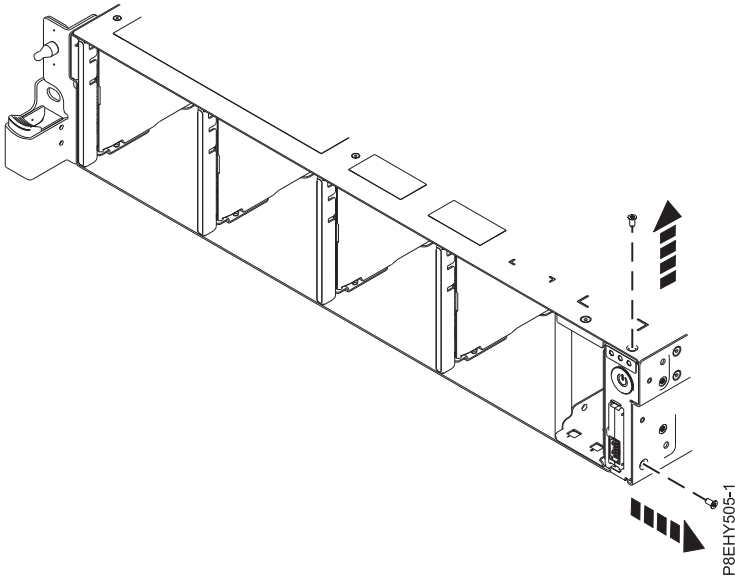
Figure 67. Remove the top and side screws

9. Pull the power switch from the system. See Figure 68.
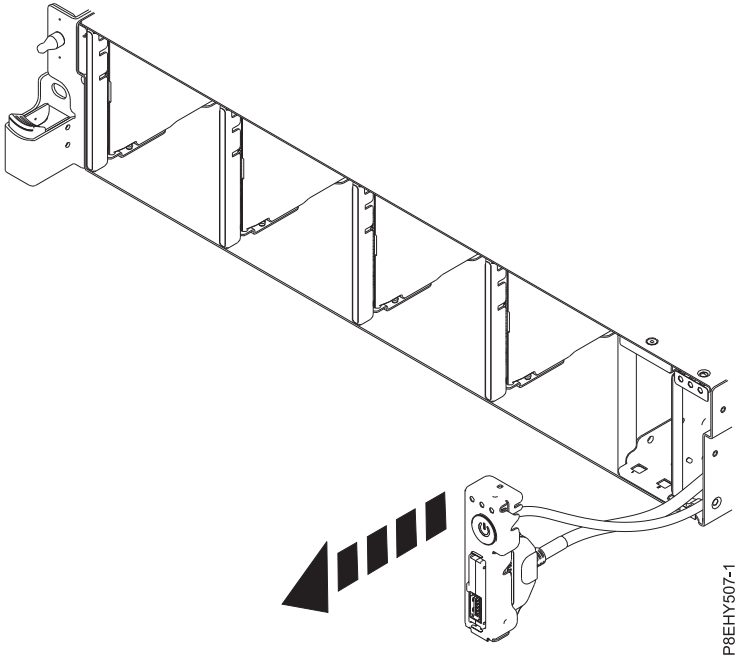
Figure 68. Pull out the power switch and cable

10. Pressing the latch releases **(A)** on the connector, disconnect the front USB cable and connector from the power switch. See Figure 69 on page 57.
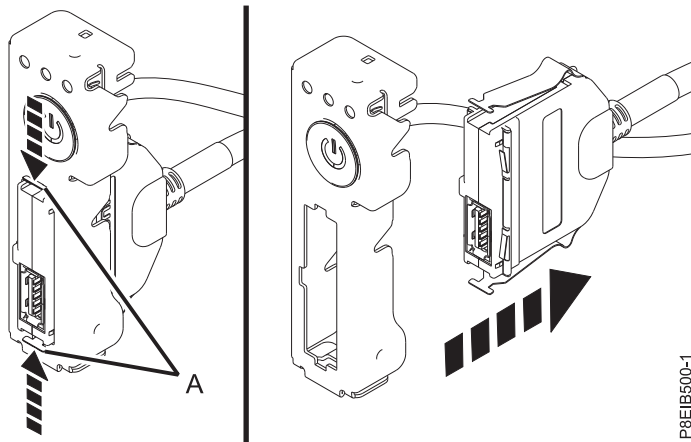
Figure 69. Removing front USB cable and connector from power switch

11. Place the front USB cable and connector and the power switch and cable on the table.

Replacing the front USB cable and connector in the 8335-GTB

Follow these steps to replace the front USB cable and connector in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Find the replacement front USB cable and connector and remove it from the protective plastic envelope.
3. While pressing in the latches **(A)**, connect the front USB cable and connector to the power switch. See Figure 70.
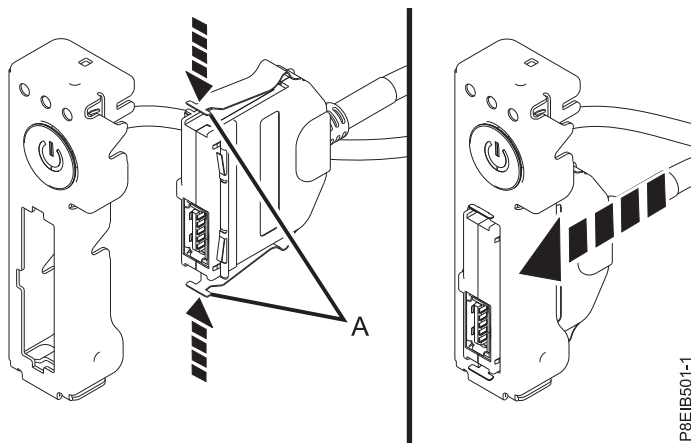
Figure 70. Attaching the front USB cable and connector to the power switch

4. Insert the front USB cable and the power switch and cable into the system. Be careful to route the cables through to the system backplane. See Figure 71 on page 58.
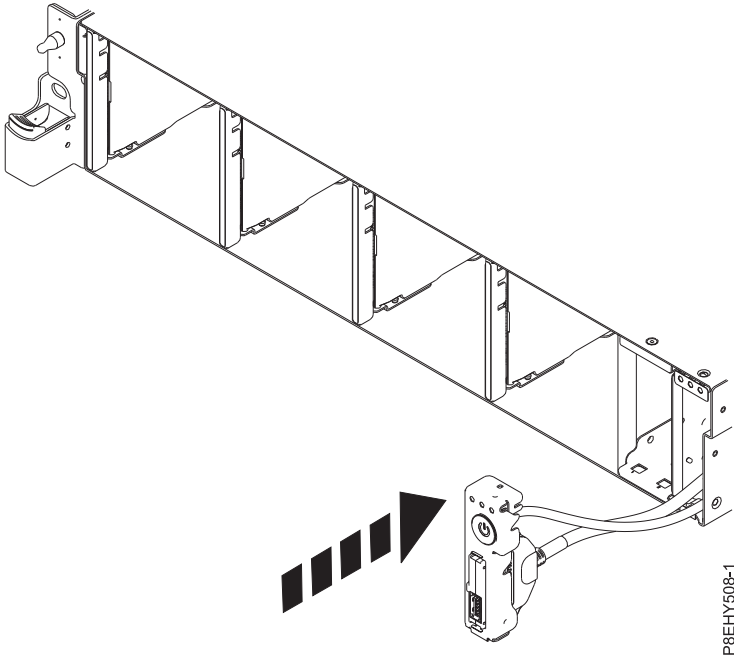
Figure 71. Replacing the front USB cable into the system backplane

5. Replace the top and side screws for the power switch. See Figure 72.
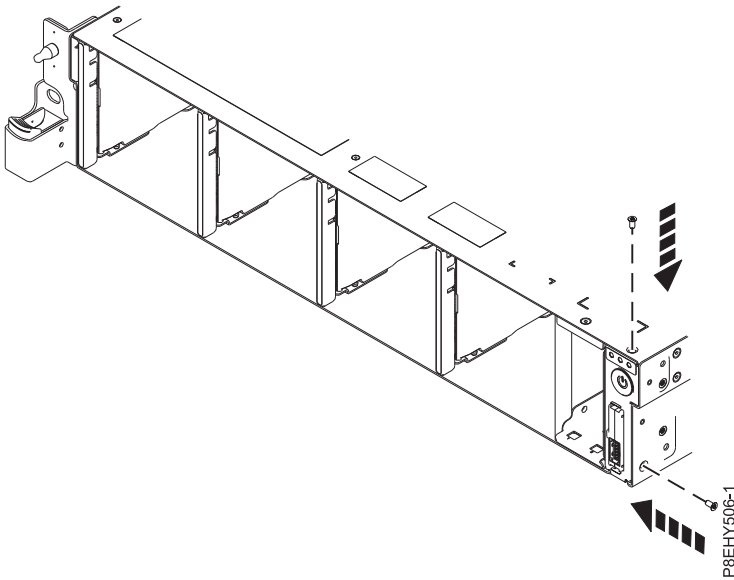
Figure 72. Replace the top and side screws

6. Using the labels, plug the front USB cable **(A)** and the power switch and cable **(B)** to the system backplane. See Figure 73 on page 59. Ensure that the cable latch clip snaps into place on the connectors.
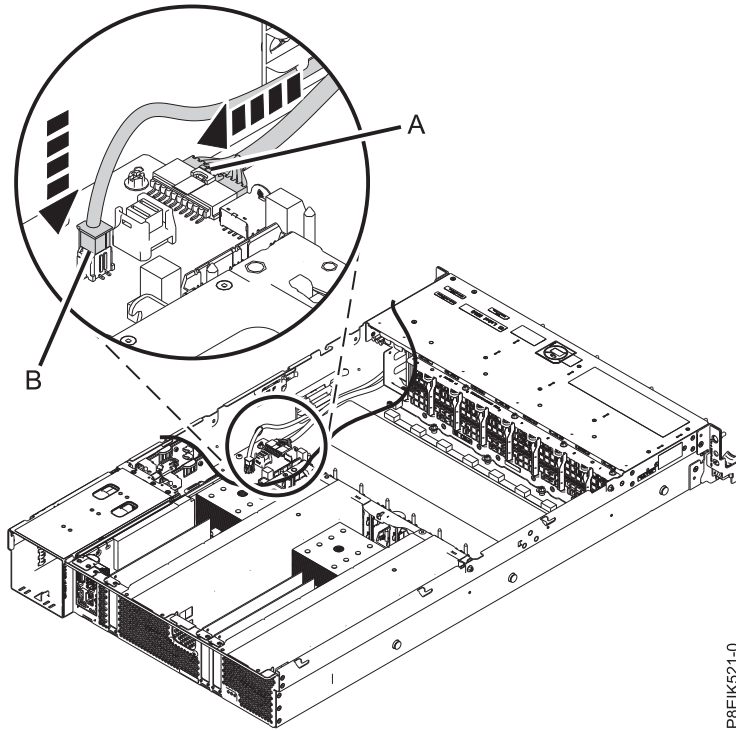
Figure 73. Plugging in the cables

7. Replace the rack installation support on the side of the system. See Figure 74.
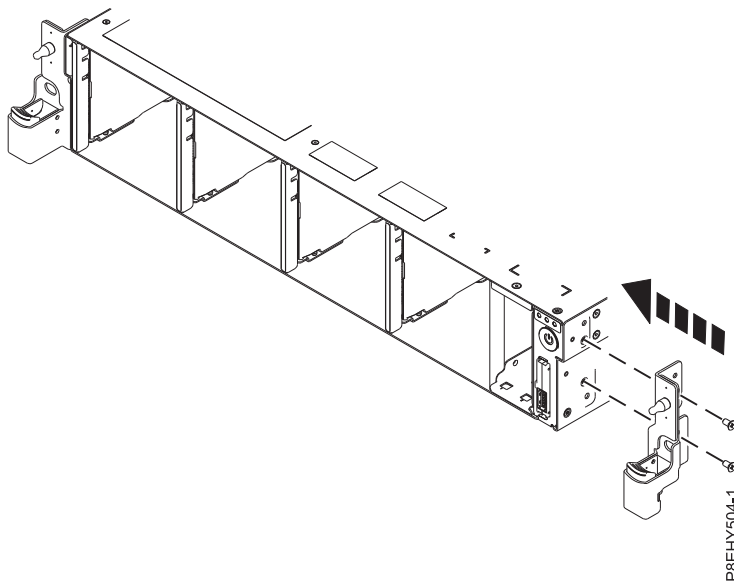
Figure 74. Replacing the rack installation support

8. Secure each cable in the retaining clip on the inside wall of the system.
9. Replace the disk drive and fan card. For instructions, see "Replacing the disk drive and fan card in the 8335-GTB" on page 41.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing a graphics processing unit in the 8335-GTB

Learn how to remove and replace a graphics processing unit (GPU) in the IBM Power System S822LC (8335-GTB) system.

Removing the graphics processing unit from an air-cooled 8335-GTB system

Learn how to remove and replace a graphics processing unit (GPU) in the air-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

About this task

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that:
* PCIe tailstock fillers are present
* Graphic processor unit (GPU) airflow tunnels are present.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

    Attention:

    * Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

    * When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the two GPU airflow tunnels that cover the GPUs.

3. If you are removing multiple GPUs, label the GPUs, noting their positions and orientations.

4. For the GPU you are removing, remove the eight screws shown in Figure 75 on page 61.

    Attention: Do not unscrew the four spring-loaded screws that attach the heat sink to the GPU.
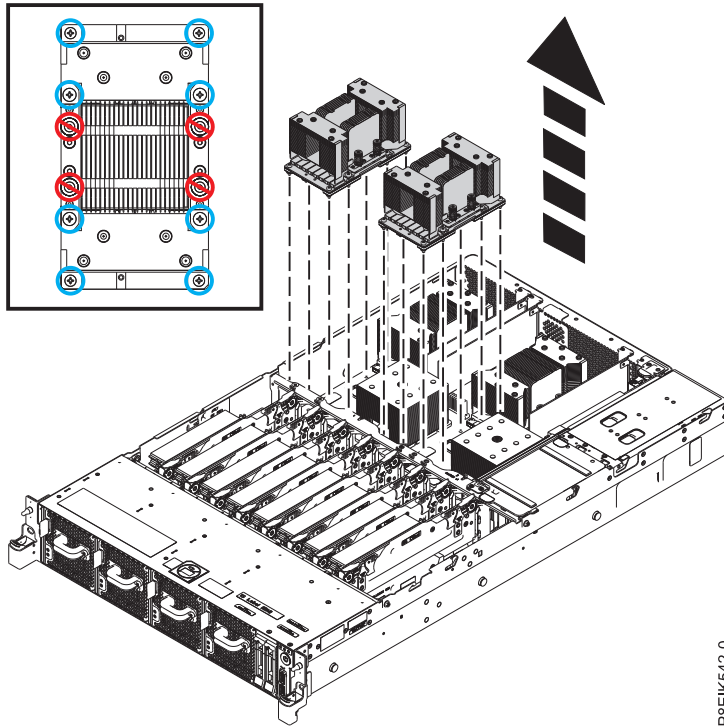
Figure 75. Remove eight GPU screws per GPU; do not loosen the four spring-loaded screws. This illustration shows two GPUs being removed.

5. Grasp the GPU by the heat sink, being careful not to bent the fins. Remove the GPU from the system backplane. Be careful of the pins on the bottom of the GPUs to avoid damaging the pins and the GPU.

Replacing the graphics processing unit in an air-cooled 8335-GTB system

Learn how to replace a graphics processing unit (GPU) in the air-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove the GPU socket protective covers from the GPU.
3. Carefully align the GPU and heat sink such that the alignment pins fit into the system backplane. Ensure that the arrow on the heatsink that indicates airflow points to the rear of the chassis. Insert the GPU into the system backplane. If you are replacing four GPUs, note that the heatsinks with the airflow tunnel go in the forward positions.
4. Secure the GPU to the system backplane. Use a #2 Phillips head screw driver. Tighten the screws in the sequence shown in Figure 76 on page 62. Start with the inner four screws. Thread the inner four screws half-way using the sequence shown. Once all four screws are threaded, then fully tighten them. Next tighten the outer four screws using the sequence shown. Take care to not damage the system backplane with the screw driver tip.
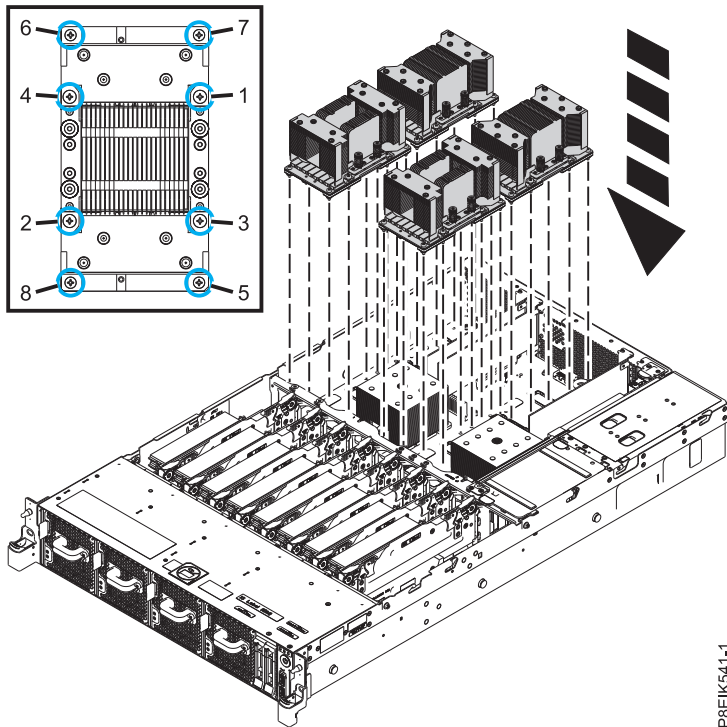
Figure 76. Replacing the GPU and heat sink into system backplane. This illustration shows four GPUs being replaced.

5. Replace the two GPU airflow tunnels that cover the GPUs. Use the alignment pins to properly insert the tunnels into the chassis.

6. Place the protective covers on the bottom of the replaced GPUs. This protects the pins when returning the GPU.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing the graphics processing unit from a water-cooled 8335-GTB system

Learn how to remove and replace a graphics processing unit (GPU) in the water-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

About this task

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that the PCIe tailstock fillers are present.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. If you are removing multiple GPUs, label the GPUs, noting their positions and orientations.

3. For the GPU you are removing, remove the cold plate. Refer to Figure 77.

   a. For the cold plate that you are removing, unlatch the service hook and rotate it into position.

      - For the cold plate in position C1, use service hook (A).
      - For the cold plate in position C4, use service hook (B).
      - For the cold plate in positions C7 and C9, use service hook (C).
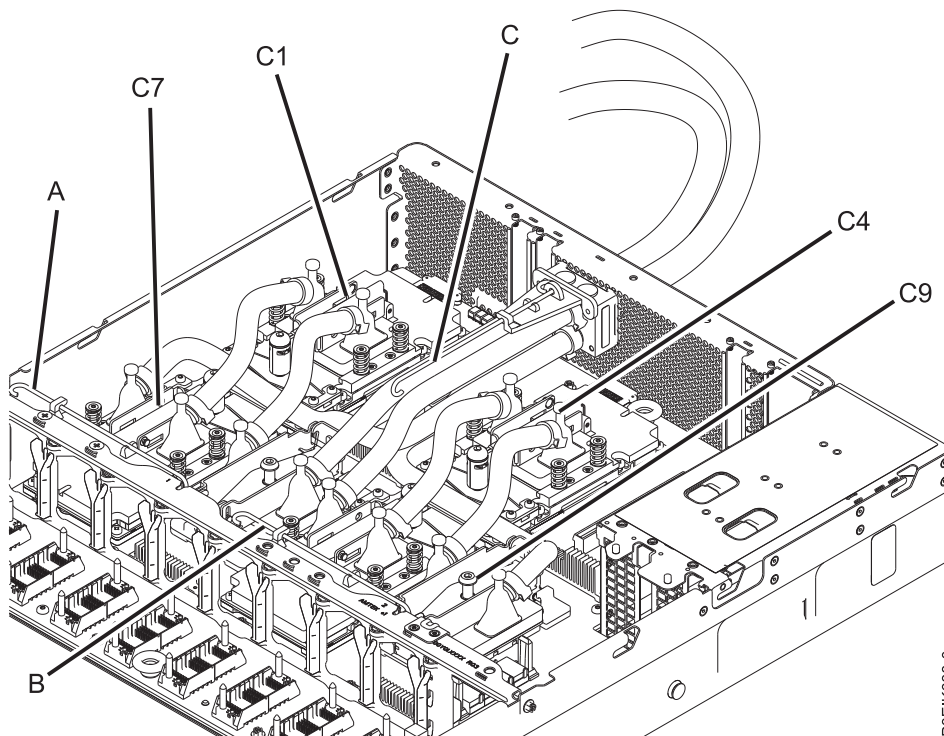
Figure 77. Cold plate service clips

   b. Loosen the cold plate retainer screw and swing the retainer open as shown in Figure 78 on page 64.

      Attention: Do not unscrew the four spring-loaded screws that attach the aluminum heat cover to the GPU.
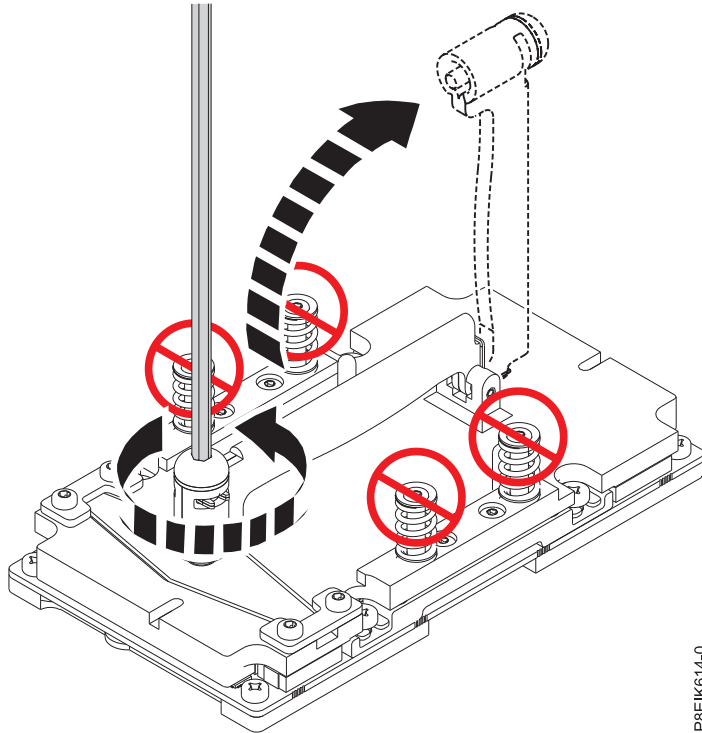
P8EIK614-0

Figure 78. Open the cold plate retainer

   c. Lift the cold plate **(A)** off the GPU that you are removing and attach the cold plate to the service hook **(B)** as shown in Figure 79 on page 65.
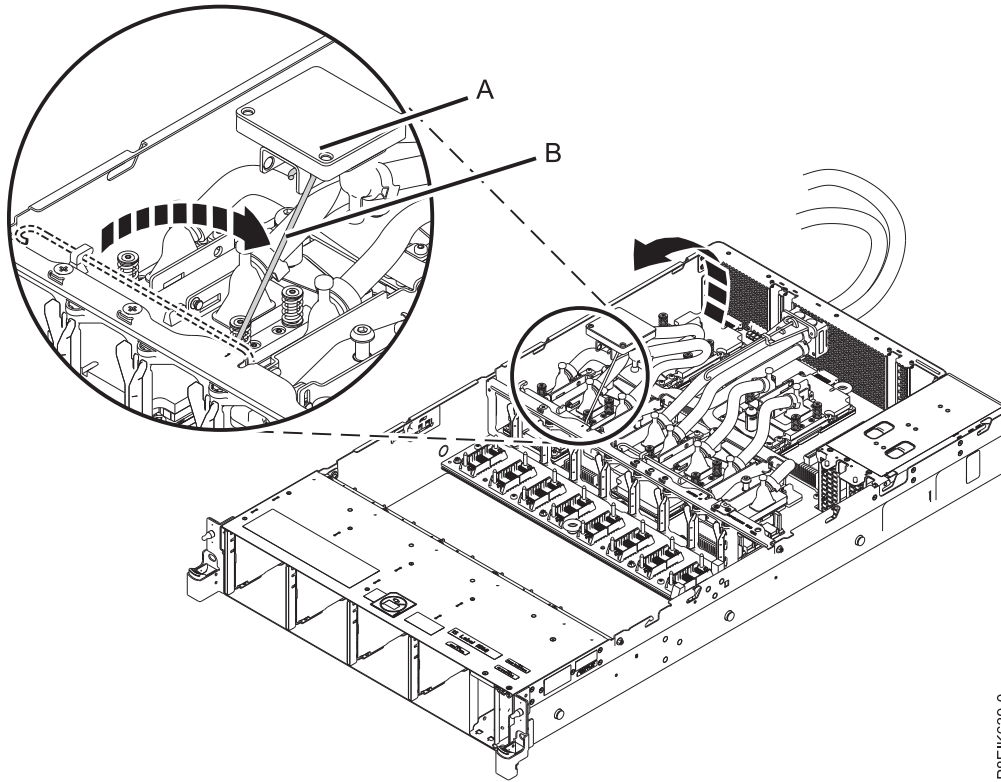
Figure 79. Remove the cold plate; attach to clip

4. For the GPU you are removing, remove the eight screws shown in Figure 80 on page 66.

   Attention: Do not unscrew the four spring-loaded screws that attach the aluminum heat cover to the GPU.
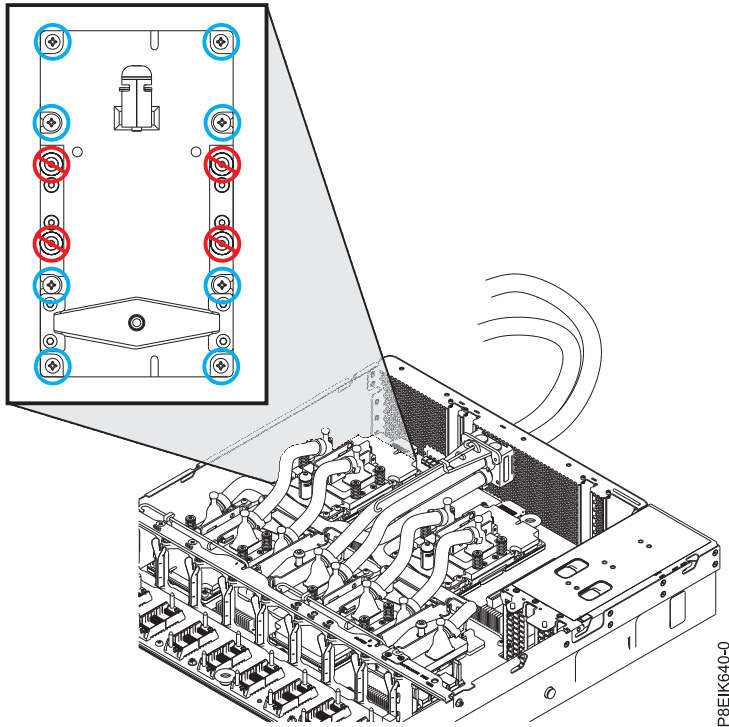
Figure 80. Remove eight GPU screws per GPU; do not loosen the four spring-loaded screws

5. Remove the GPU from the system backplane. Be careful of the pins on the bottom of the GPUs to avoid damaging the pins and the GPU. See Figure 81.
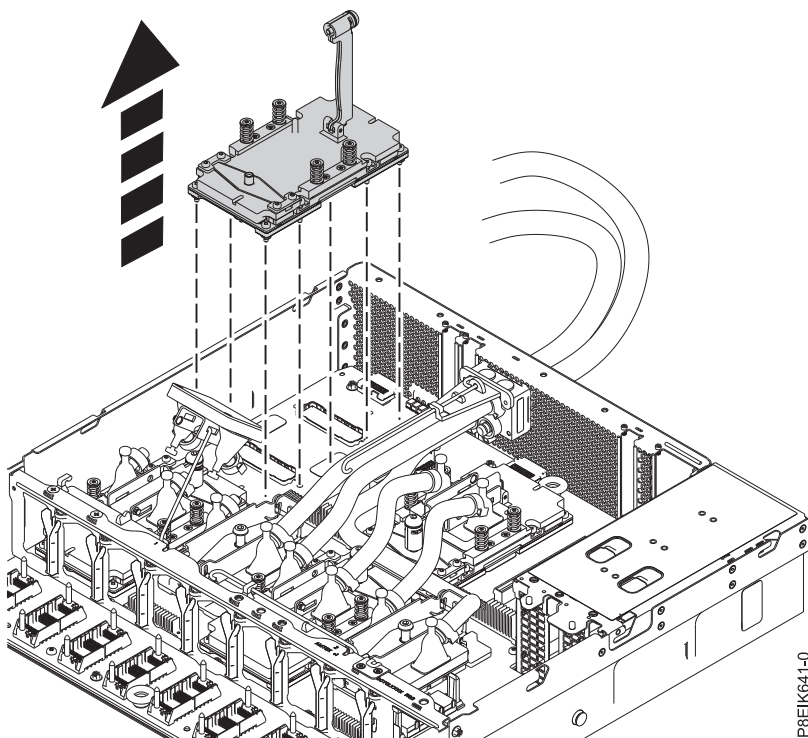
Figure 81. Remove GPU

Replacing the graphics processing unit in a water-cooled 8335-GTB system

Learn how to replace a graphics processing unit (GPU) in the water-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Using your labels, noting the orientation of the GPU, use the alignment pins under the GPU to carefully insert the GPU onto the system backplane.
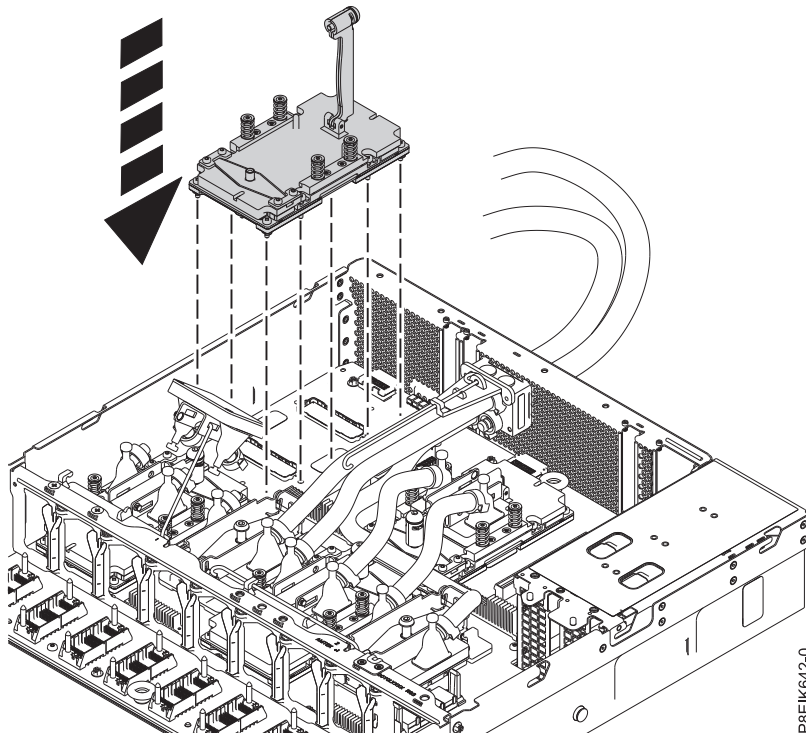
Figure 82. Replace GPU

3. Secure the GPU by threading the eight screws into the system backplane as shown in Figure 83 on page 68. Use a #2 Phillips head screw driver to tighten the eight screws. Take care to not damage the system backplane with the screw driver tip.

P8EIK643-0
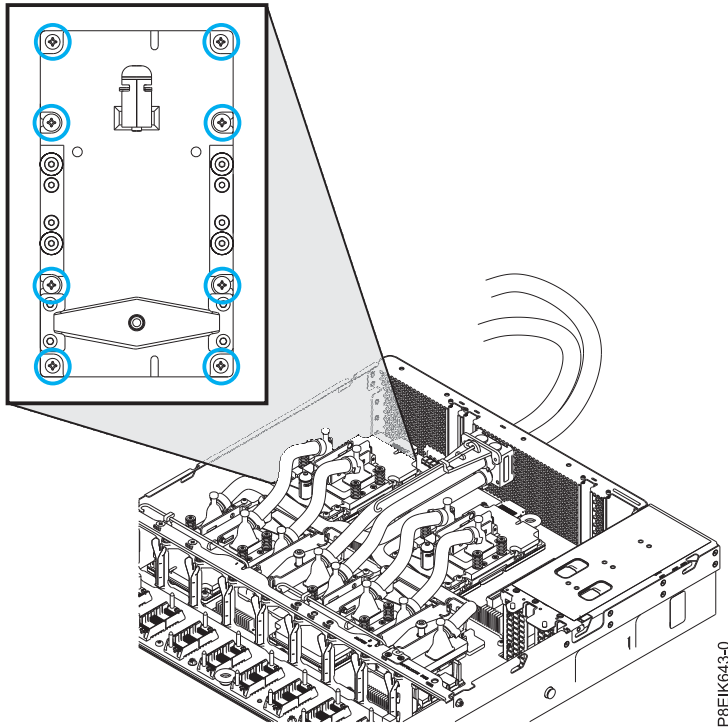
Figure 83. Replacing the GPU assembly into GPU socket

4. Place a new TIM on the aluminum heat cover of the GPU.

   Note: A TIM is included in the water-cooled GPU kit. If you need an additional TIM, order the system processor TIM replacement kit. For information about part numbers, see 8335-GTB parts.

5. For the GPU you are replacing, install the cold plate.

   a. Unhook the cold plate **(A)** from the service hook **(B)** and carefully align the cold plate onto the GPU. See Figure 84 on page 69.
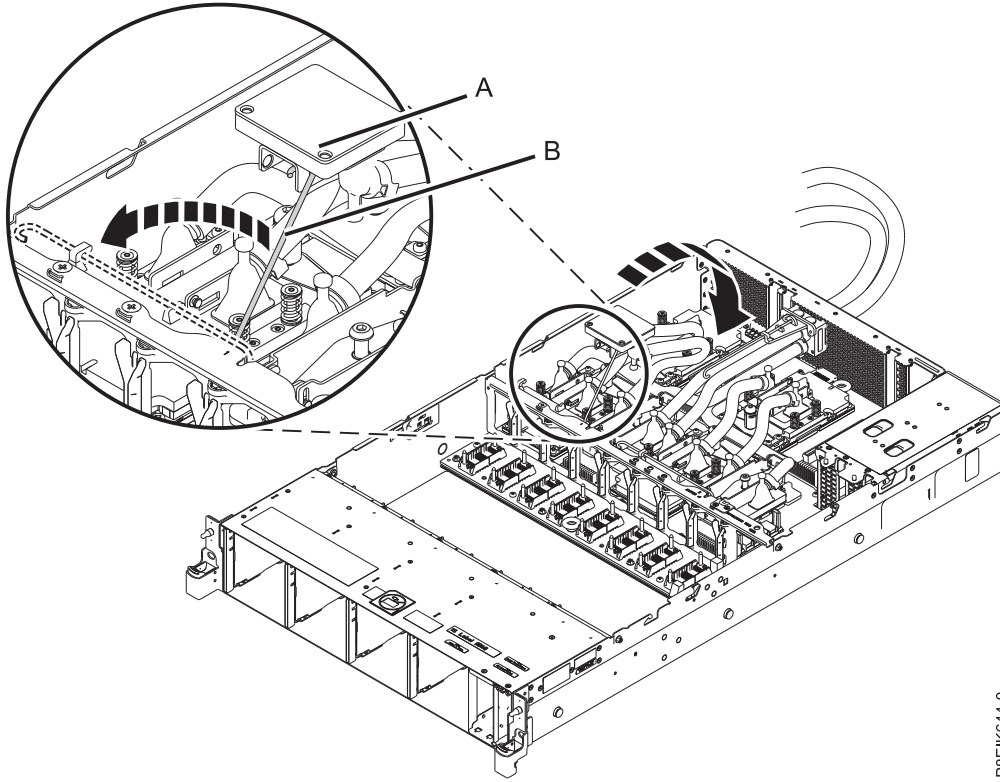
Figure 84. Aligning the cold plate on the GPU

b. Swing the retainer over the GPU and code plate, then tighten the cold plate retainer screw as shown in Figure 85 on page 70.
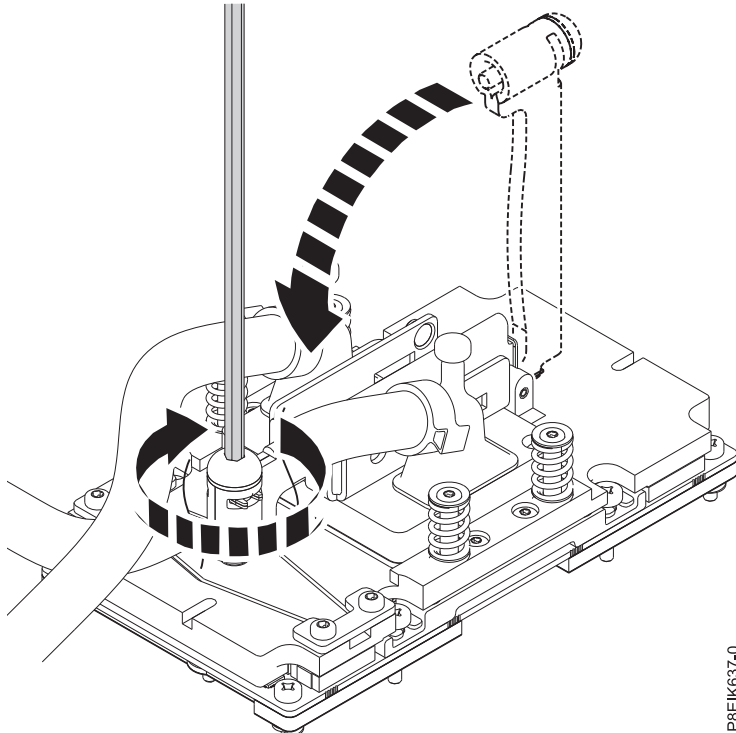
Figure 85. Secure the cold plate retainer screw

    c. Return the service hook to its latched position on the bracket.

6. Place the protective covers on the bottom of the replaced GPUs. This protects the pins when returning the GPU.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing memory and memory risers in the 8335-GTB

Learn how to remove and replace memory and memory risers in the IBM Power System S822LC (8335-GTB) system.

Removing and replacing memory DIMM in the 8335-GTB

Learn how to remove and replace memory DIMM in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

Remove:

2. Locate the memory riser that contains the failed memory DIMM. Figure 86 shows the location of the memory risers in the 8335-GTB system and Figure 87 on page 72 shows the DIMM slot locations on the riser.
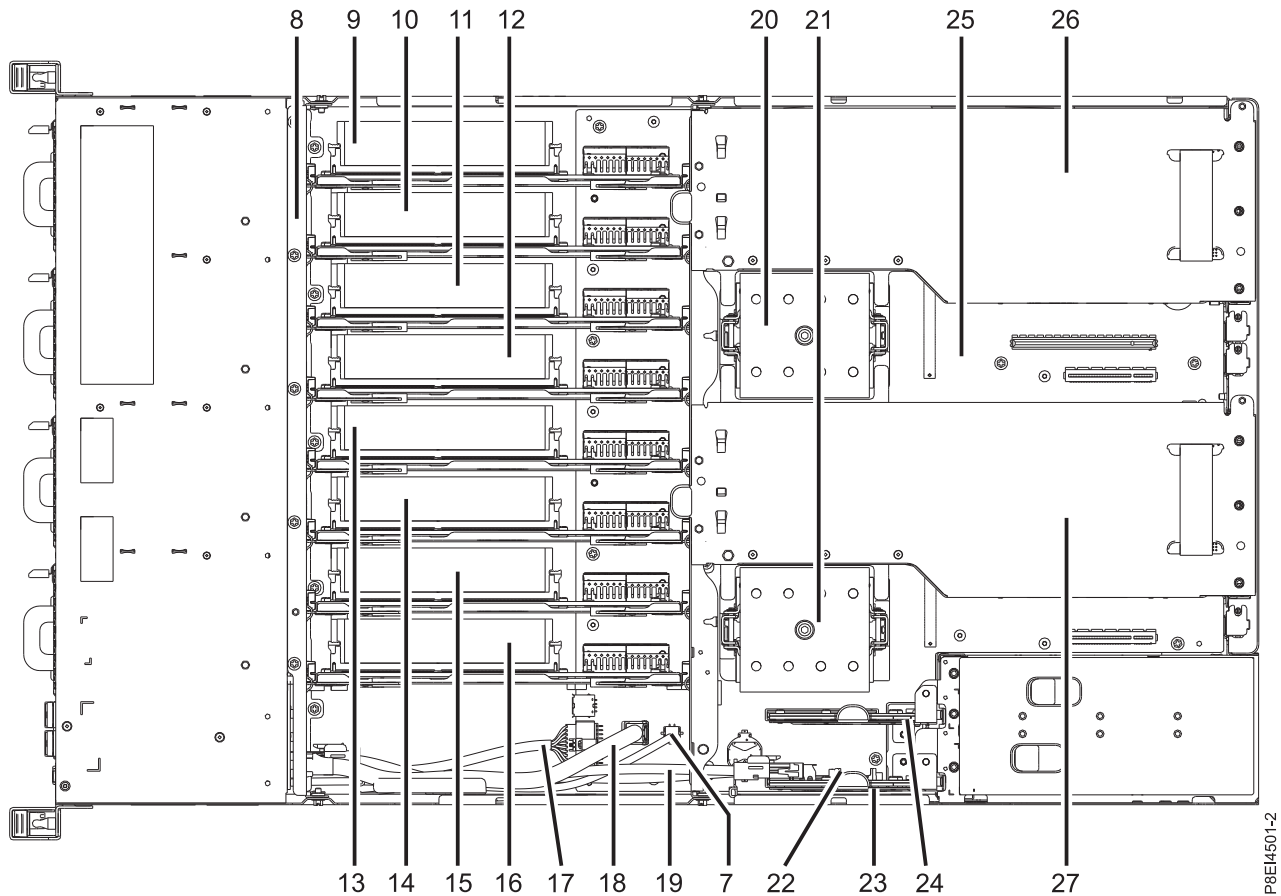
Figure 86. Location of the memory risers; positions 9 through 16
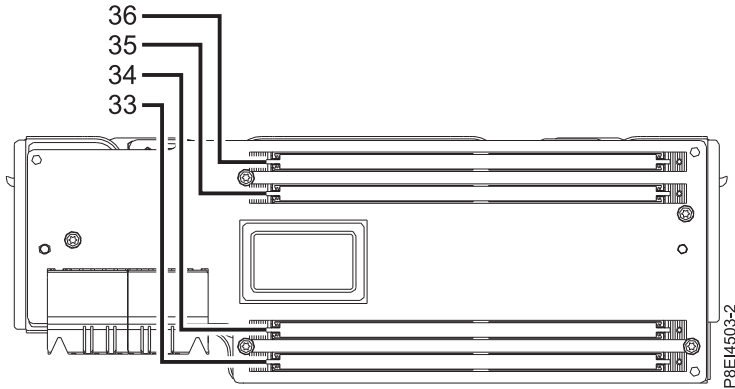
Figure 87. Location of the memory DIMM slots on the riser; positions 33 through 36

3. Remove the memory riser that contains the failed memory DIMM.

   a. Open the release latches on the memory riser. See **(A)** in Figure 88.
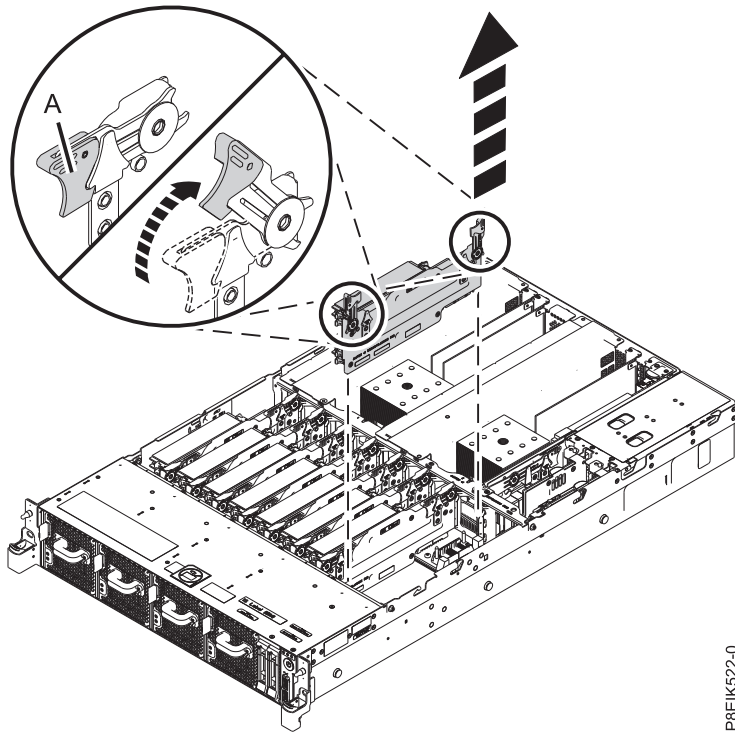
Figure 88. Removing a memory riser from the system

   b. Pull out the memory riser from the slot by holding onto the latches.

   c. Place the memory riser on an ESD mat.

4. Remove the failed memory DIMM from the slot on the memory riser.

   a. Unlock the DIMM by pushing the locking tabs away from the DIMM, in the direction shown in Figure 89 on page 73. The lever action of opening the tabs pushes the memory DIMM out of the slot.
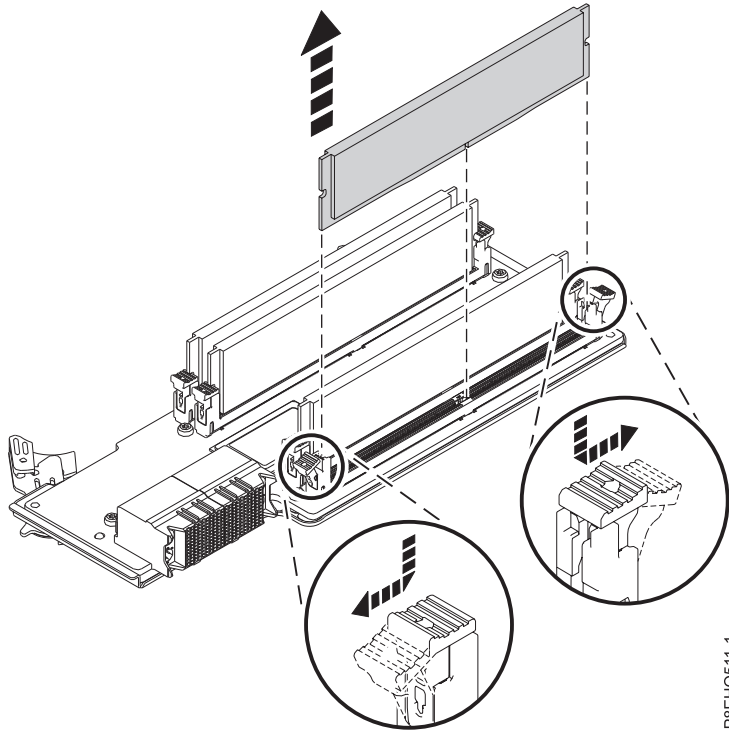
Figure 89. Removing memory DIMM from a slot on the riser

    b. Hold the memory DIMM by the edges and pull it out of the slot on the riser.

5. Place the memory on an ESD mat.

Replace:

6. To replace memory DIMM, complete the following steps:

    a. Push the locking tabs to the open position, away from the slot, in the direction shown in Figure 90 on page 74.
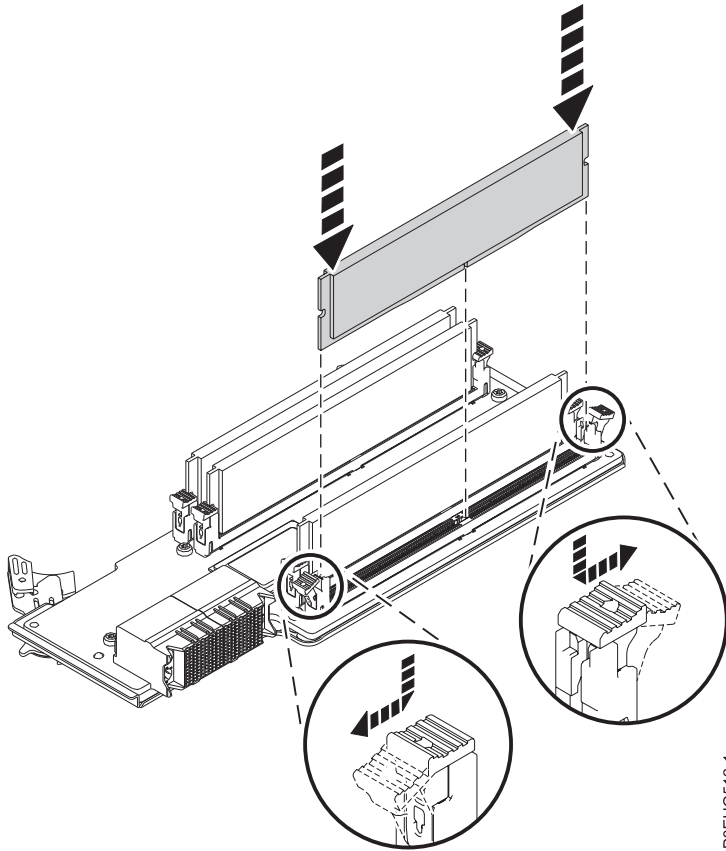
Figure 90. Replacing memory DIMM in a slot on the riser

    b. Grasp the memory DIMM along its edges and align it with the slot on the riser.

      Attention: Memory is keyed to prevent it from being installed incorrectly. Note the location of the key tab within the memory connector before you attempt to install it.

    c. Press firmly on each side of the memory DIMM until the locking tab locks in place with an audible click.

7. To replace the memory riser, complete the following steps:

    a. Ensure that the release latches are open to about a 60-degree angle as shown in Figure 91 on page 75.

    b. Align the memory riser with the connector.

    c. Press the memory riser firmly into the connector.

    d. Press the release latches into the closed position. See **(A)** in Figure 91 on page 75.
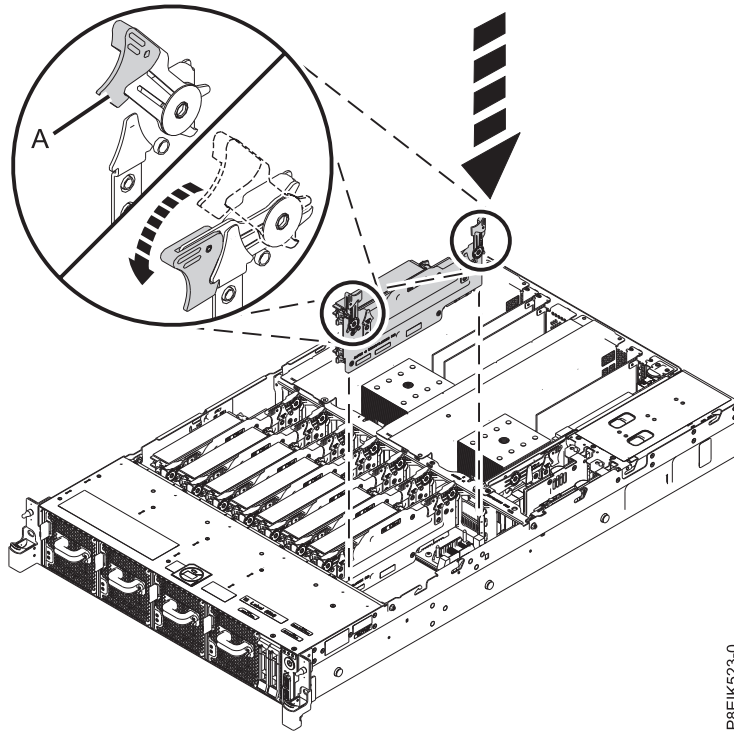
Figure 91. Replacing a memory riser in the system

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing memory risers in the 8335-GTB

Learn how to remove and replace memory risers in the IBM Power System S822LC (8335-GTB) system.

Removing memory risers from the 8335-GTB

Learn how to remove memory risers in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   • Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   • When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. Locate the memory riser. Figure 92 shows the location of the memory risers in the 8335-GTB system.
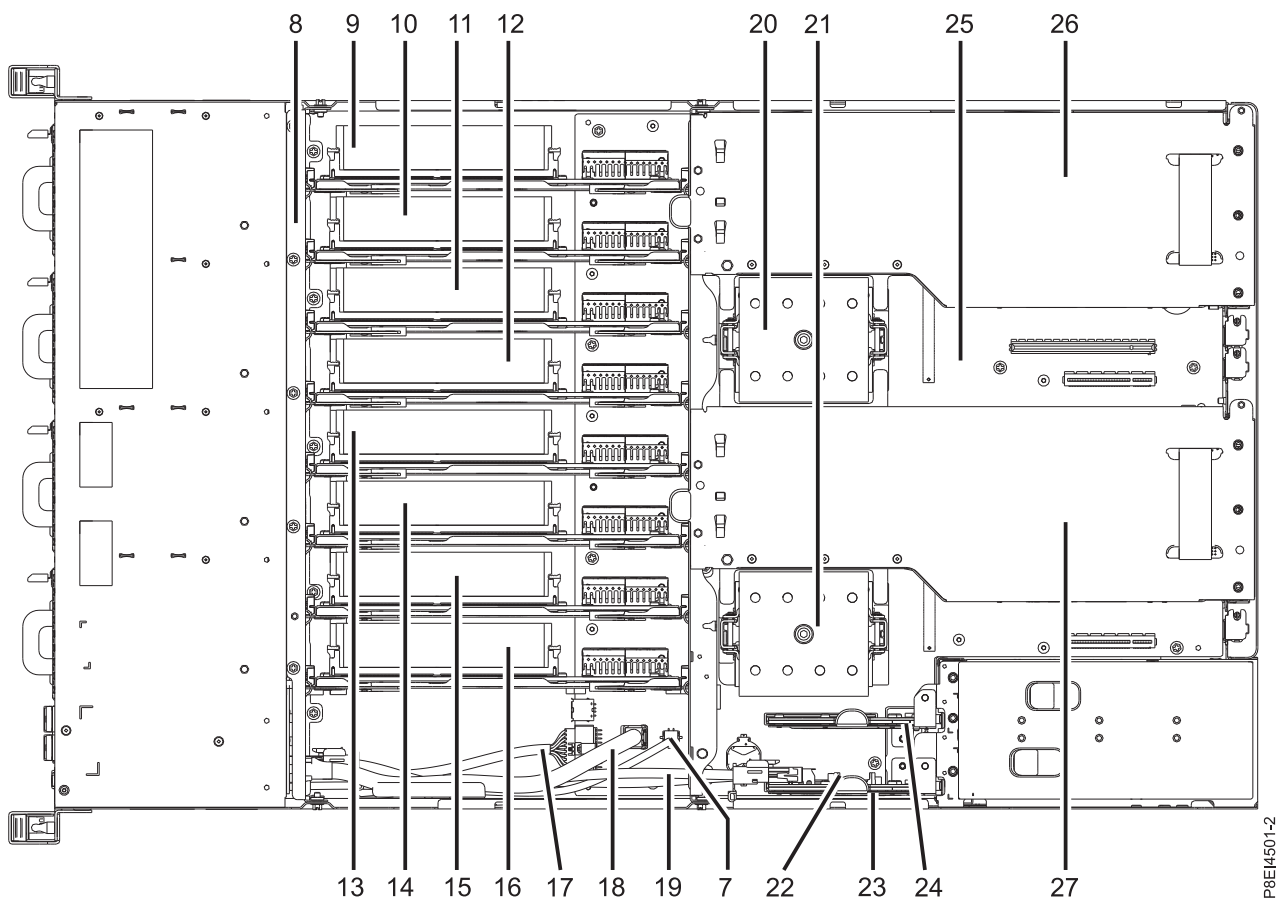
Figure 92. Location of the memory risers; positions 9 through 16

3. Remove the memory riser.

   a. Open the release latches on the memory riser. See **(A)** in Figure 93 on page 77.
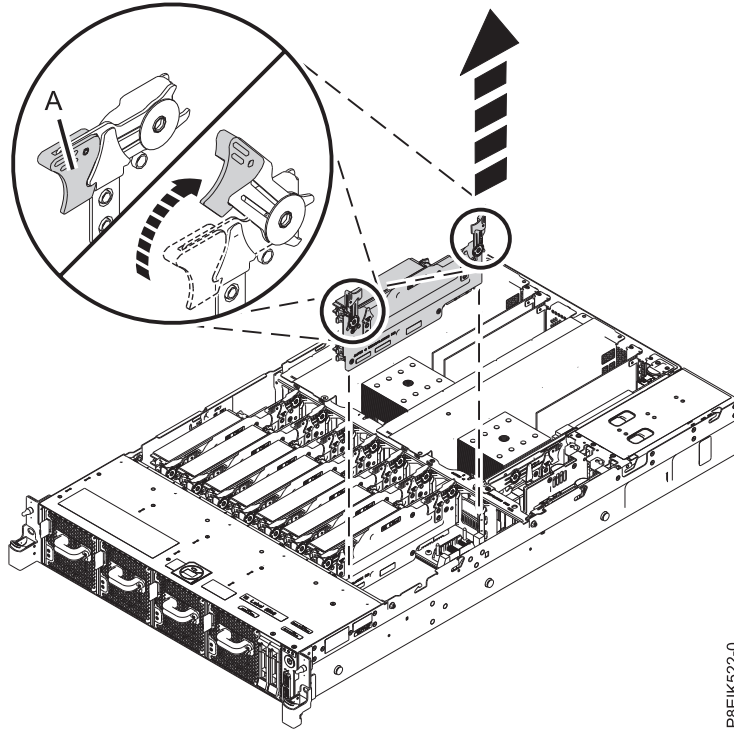
Figure 93. Removing a memory riser from the system

 b. Pull out the memory riser from the slot by holding onto the latches.

 c. Place the memory riser on an ESD mat.

4. If applicable, move the memory DIMM from the removed riser onto the replacement memory riser. For instructions, see "Removing and replacing memory DIMM in the 8335-GTB" on page 70.

Replacing memory risers in the 8335-GTB

Learn how to replace memory risers in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. To replace the memory riser, complete the following steps:

 a. Ensure that the release latches are open to about a 60-degree angle as shown in Figure 94 on page 78.

 b. Align the memory riser with the connector.

 c. Press the memory riser firmly into the connector.

 d. Press the release latches into the closed position. See **(A)** in Figure 94 on page 78.
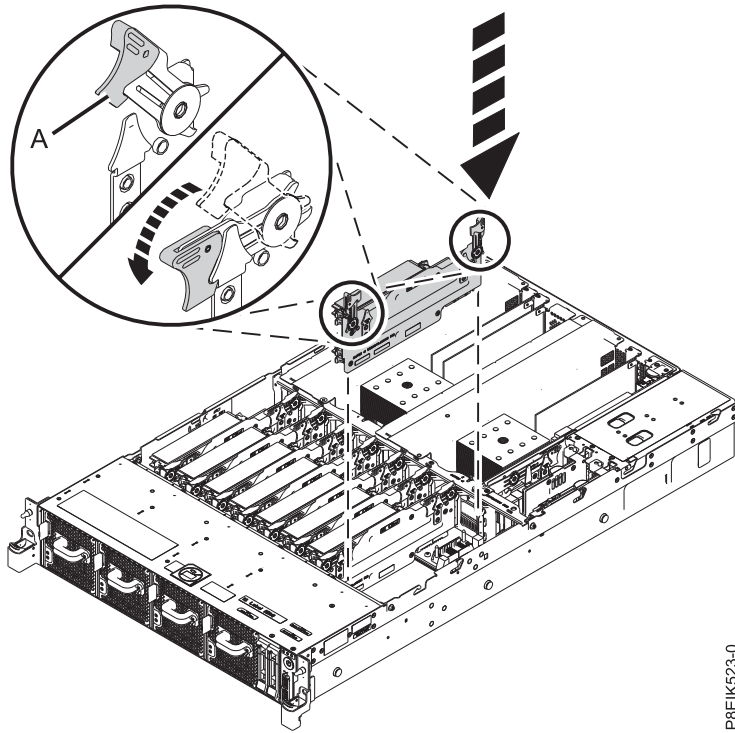
Figure 94. Replacing a memory riser in the system

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Plugging rules for memory in the 8335-GTB system

Learn the memory placement rules for the IBM Power System S822LC (8335-GTB) system.

The 8335-GTB has memory configurations of 128 GB, 256 GB, 512 GB, or 1024 GB. All eight memory risers are installed and each must have four DIMMs. The system has a total of 32 DIMMs. All DIMMs must be the same memory size and must not be mixed. The supported DIMM sizes are either 4 GB, 8 GB, 16 GB, or 32 GB. Mixing of memory feature codes or DIMM sizes is not allowed.

Table 1 lists the supported memory feature codes and Table 2 on page 79 shows the allowed memory capacity points.

Table 1. Memory feature codes

Supported feature codes (FC)	Size
EM55	16 GB (4X4GB) IS RDIMMS (1.35 V) 4GBIT DDR4 DRAMS with memory riser
EM56	32 GB (4X8GB) IS RDIMMS (1.35 V) 1333MHZ 4GBIT DDR3 DRAMS with memory riser
EM57	64 GB (4X16GB) IS RDIMMS (1.35 V) 1333MHZ 4GBIT DDR3 DRAMS with memory riser
EM58	128 GB (4X32GB) IS RDIMMS (1.35 V) 1066MHZ 4GBIT DDR3 DRAMS with memory riser

Table 2. Memory configuration as a function of the number of DIMMs and risers. You read this table by selecting the individual DIMM size row in the leftmost column, then move to the right and select the columns for the memory capacity. The riser quantity value that is listed is the quantity of the memory feature code that can be ordered, which corresponds to the DIMM size in the leftmost column.

DIMM Size	128 GB		256 GB		512 GB		1024 GB	
	DIMMs	Risers	DIMMs	Risers	DIMMs	Risers	DIMMs	Risers
4 GB	32	8						
8 GB			32	8				
16 GB					32	8		
32 GB							32	8

Removing and replacing PCIe adapters in the 8335-GTB

Learn about removing and replacing Peripheral Component Interconnect (PCI) Express (PCIe) adapters in the IBM Power System S822LC (8335-GTB) system.

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that:
- PCIe tailstock fillers are present
- Graphic processor unit (GPU) airflow tunnels are present.

Removing a PCIe adapter from the system backplane in the 8335-GTB

Learn about removing Peripheral Component Interconnect (PCI) Express (PCIe) adapters in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

About this task

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that:
- PCIe tailstock fillers are present
- Graphic processor unit (GPU) airflow tunnels are present.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. If needed, label and remove the cables from the PCIe adapter. Also, if needed, label and remove any plugs that extend out of the PCIe adapter.

3. Remove the PCIe adapter from the system backplane
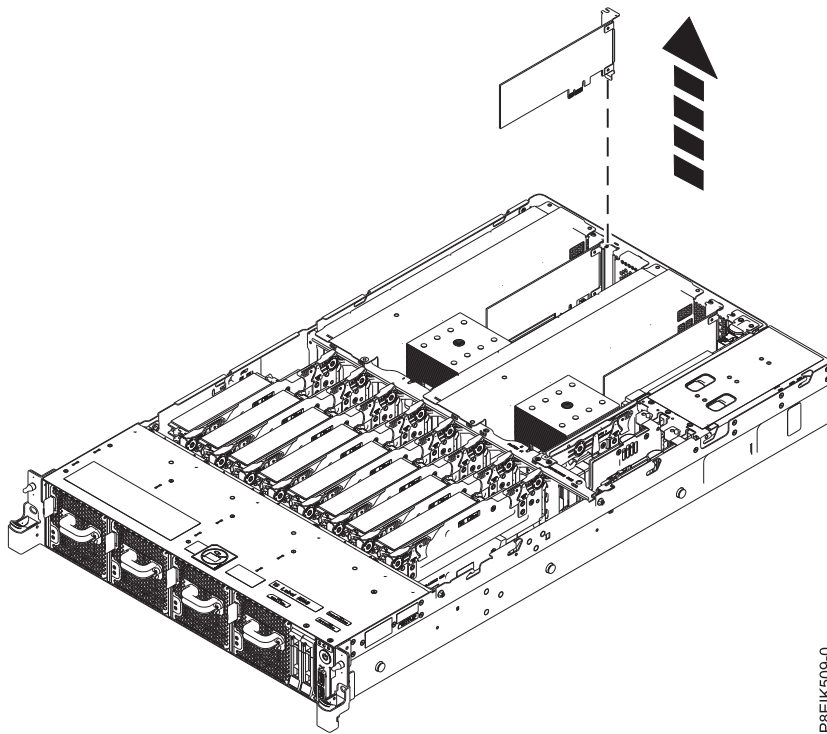
Figure 95. Removing a PCIe adapter

4. Place the PCIe adapter on an ESD mat.

Replacing a PCIe adapter in the system backplane in the 8335-GTB

Learn about replacing Peripheral Component Interconnect (PCI) Express (PCIe) adapters in the IBM Power System S822LC (8335-GTB) system.

About this task

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that:
- PCIe tailstock fillers are present
- Graphic processor unit (GPU) airflow tunnels are present.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Insert the replacement PCIe adapter into the system backplane as shown in Figure 96 on page 81, aligning the adapter properly and inserting it fully into the slot. When inserting a long PCIe adapter card into slot 2 in a system that is water cooled, be careful to ensure that the water hose is not pinched under the adapter card. Route the water hose around the end of the adapter card.

P8EIK510-0
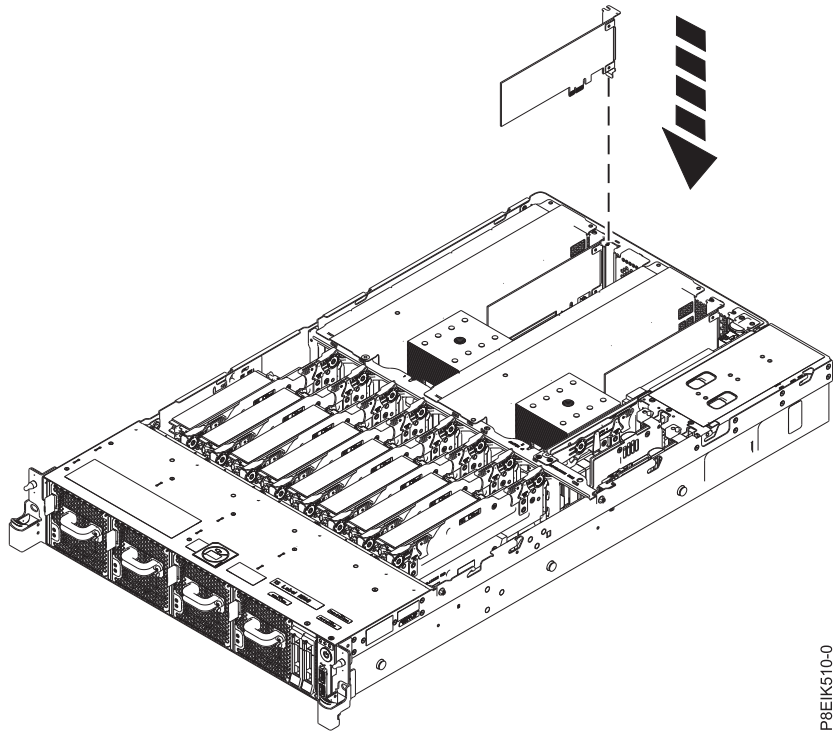
Figure 96. Inserting a PCIe adapter

3. Using your labels, replace any plugs that you removed from the PCIe adapter. Using your labels, insert the cables into the PCIe adapter.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing power risers in the 8335-GTB

Find information about removing and replacing power risers in the IBM Power System S822LC (8335-GTB) system.

Removing a power riser from the 8335-GTB

Find information about removing power risers in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the power riser air baffle. Using the blue tabs **(A)**, unsnap the baffle and lift it from the system. See Figure 97.

Figure 97. Removing the power riser air baffle

3. Locate the power risers. Figure 98 on page 83 shows the location of the power risers in the 8335-GTB system. The **(B)** power riser contains the time-of-day battery and the connector for the fan power cable.
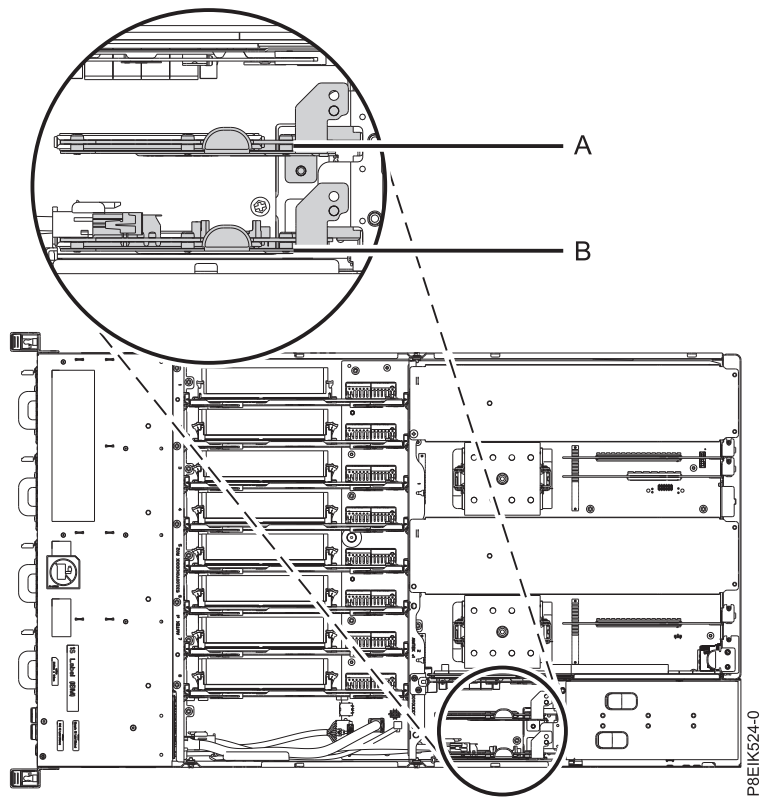
Figure 98. Location of the power risers

4. Remove the power riser.

   a. If applicable, disconnect the fan power cable from the power riser **(A)** in Figure 99 on page 84, by pressing the latch release lever with your thumb.

      Note: The latch release on the connector must be depressed before you unplug the cable. Failure to do so might damage the cable and the connector.

   b. Pull out the power riser from the slot by holding the blue tab. See **(B)** in Figure 99 on page 84.
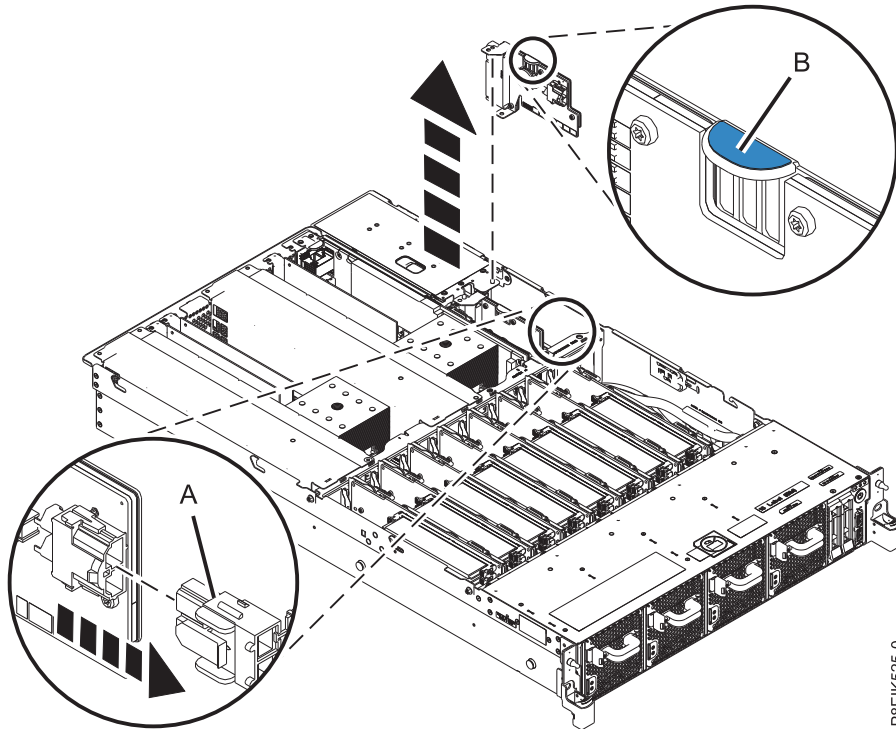
Figure 99. Removing a power riser from the system

    c. Place the power riser on an ESD mat.

Replacing a power riser in the 8335-GTB

Find information about replacing power risers in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. If applicable, replace the time-of-day battery in the slot on the power riser. For instructions, see "Removing and replacing the time-of-day battery in the 8335-GTB" on page 172. The existing time-of-day battery can be reused, but IBM suggests installing a new time-of-day battery when you replace the power riser.
3. To replace a power riser, complete the following steps:
   a. Hold the power riser by the blue tab as you position the notch on the riser over the pin on the system's chassis. See **(B)** in Figure 100 on page 85.
   b. Insert the power riser into the slot. Use the alignment pins to properly insert the riser. See **(A)** in Figure 100 on page 85.
   c. If applicable, reconnect the fan power cable to the power riser. See **(C)** in Figure 100 on page 85.
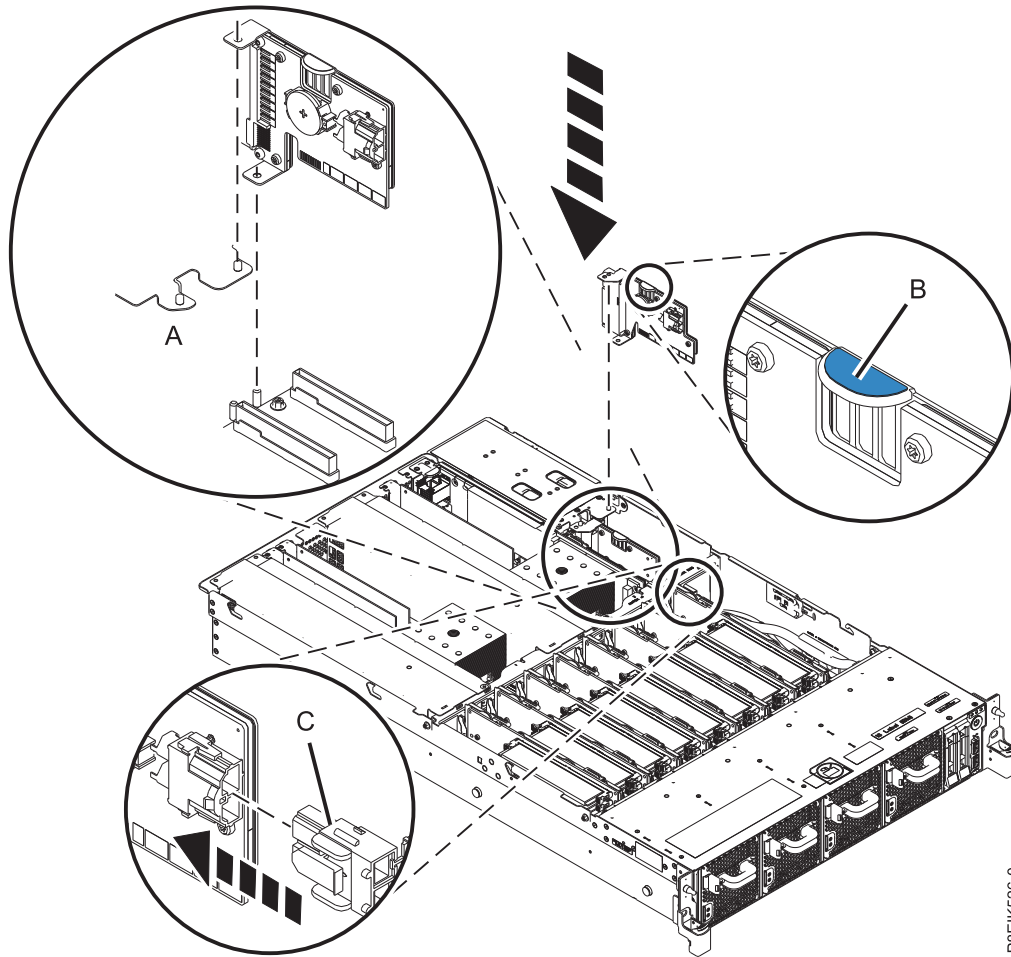
Figure 100. Replacing a power riser in the system

4. Install the power riser air baffle. Ensure that the holes in the baffle align with the pins on the system. Using the blue tabs **(C)**, insert the edge **(A)** of the baffle into the side of the system **(B)**. Then snap the baffle down into place. See Figure 101 on page 86.
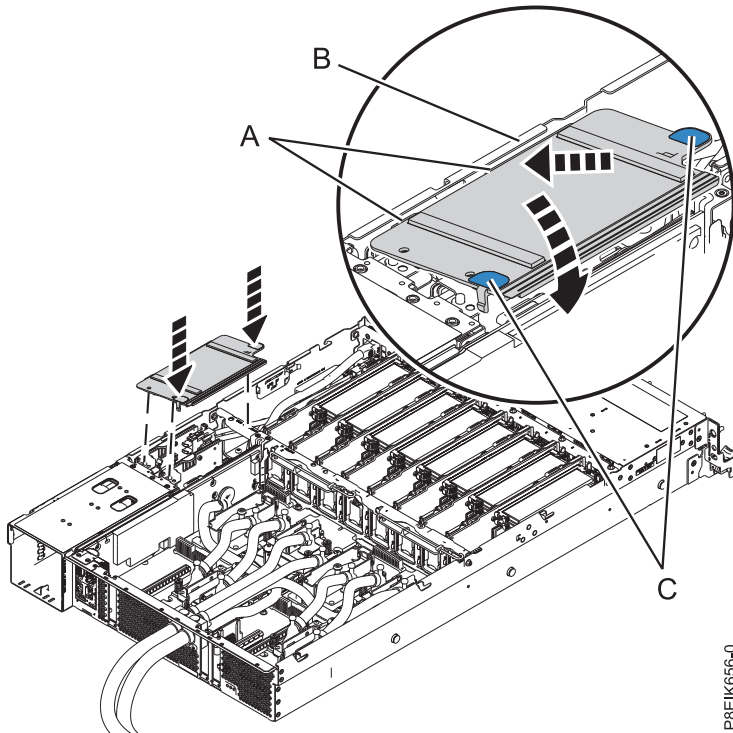
Figure 101. Installing the power riser air baffle

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the power switch and cable in the 8335-GTB

Learn how to remove and replace the power switch and cable in the IBM Power System S822LC (8335-GTB) system.

Removing the power switch and cable from the 8335-GTB system

Learn how to remove and replace the power switch and cable in the IBM Power System S822LC (8335-GTB) system.

Before you begin

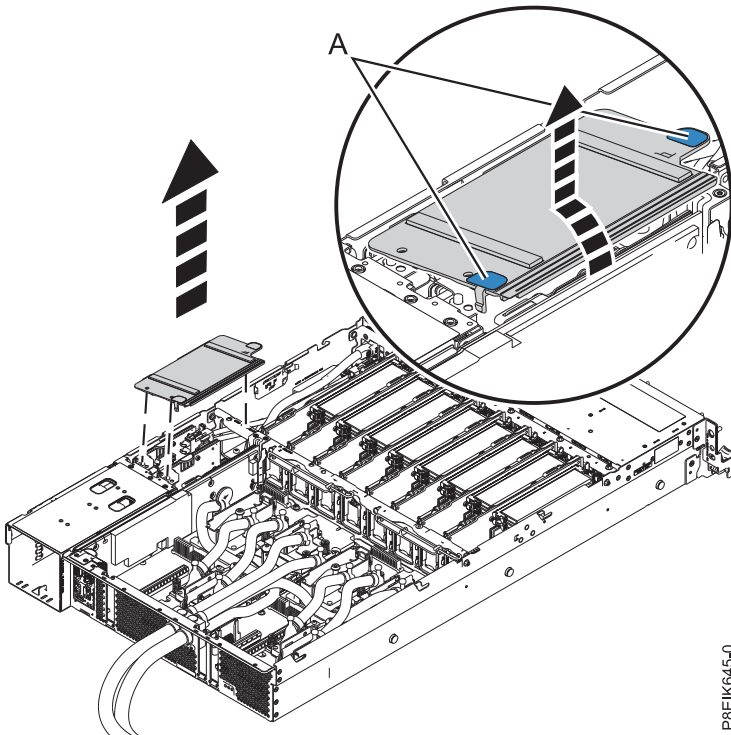Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the disk drive and fan card. For instructions, see "Removing the disk drive and fan card from the 8335-GTB" on page 39.

3. Locate the front USB cable **(A)** and the power switch and cable **(B)**. They connect between the system backplane and the power switch along the inside of the system. Label each cable. See Figure 102.
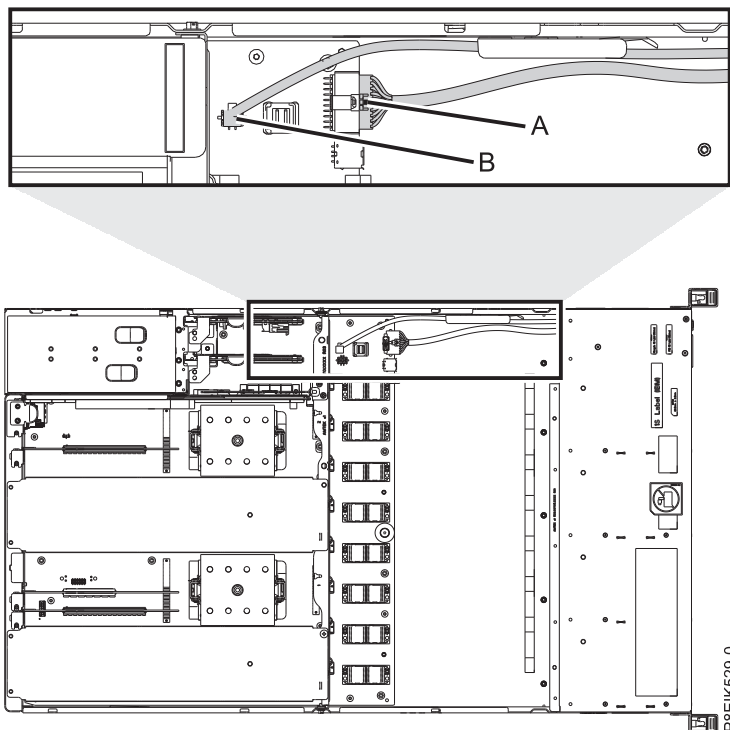
Figure 102. Location of the power switch and cable connectors

4. Release each cable from the retaining clip on the inside wall of the system.

5. Pressing the latch release on the connector, disconnect the front USB cable **(A)**. See Figure 103 on page 88.

   Note: The latch release on the connector must be depressed before you unplug the cable. Failure to do so can damage the cable and the connector.
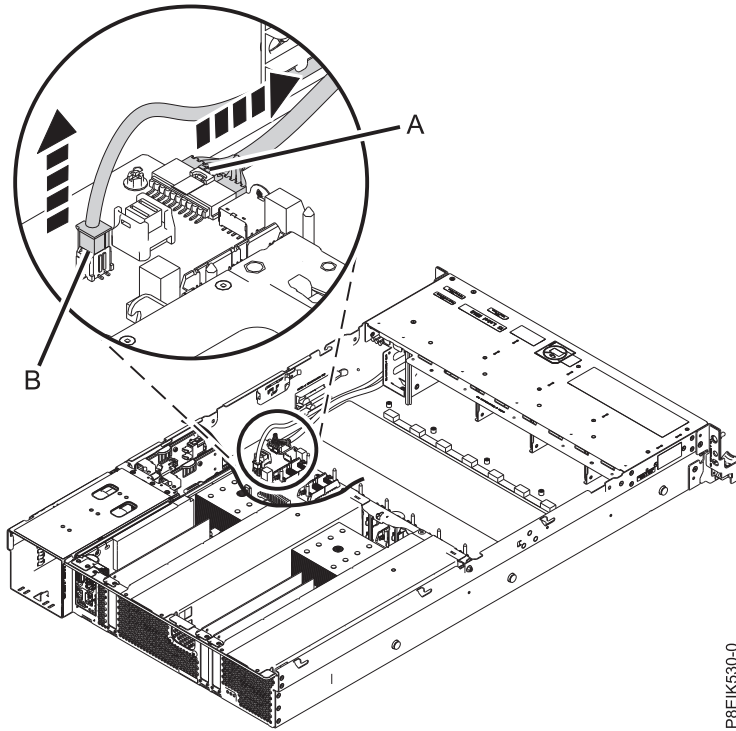
Figure 103. Removing the front USB cable and the power switch and cable from the system backplane and the disk drive and fan card

6. Pressing the latch release on the connector, disconnect the power switch and cable **(B)** from the system backplane. See Figure 103.

7. Remove the rack installation support from the side of the system. See Figure 104.
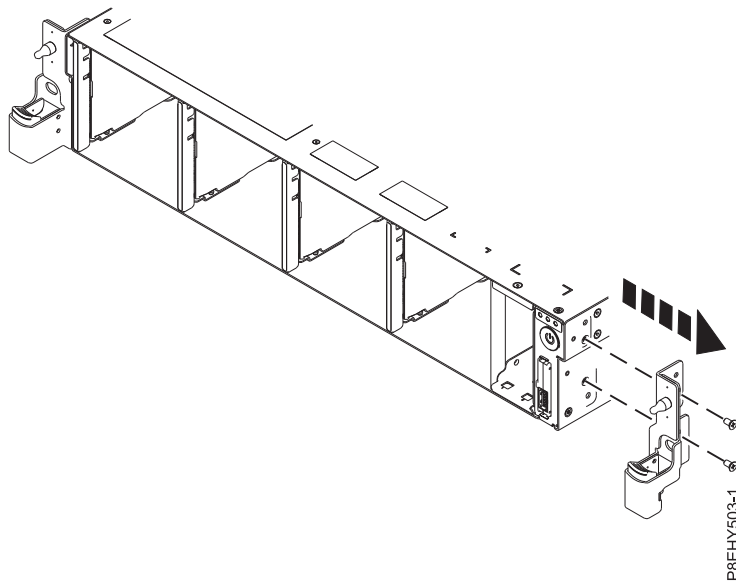
Figure 104. Removing the rack installation support

8. Remove the top and side screws from the power switch. See Figure 105 on page 89.
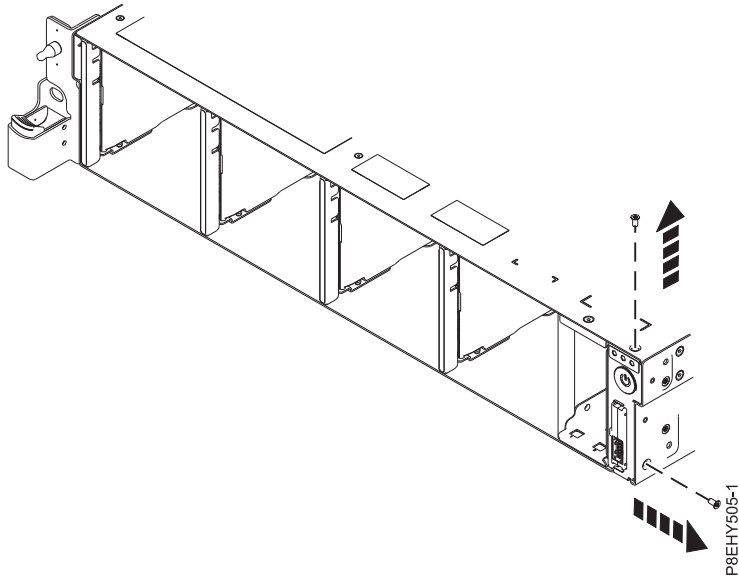
Figure 105. Remove the top and side screws

9. Pull the power switch from the system. See Figure 106.
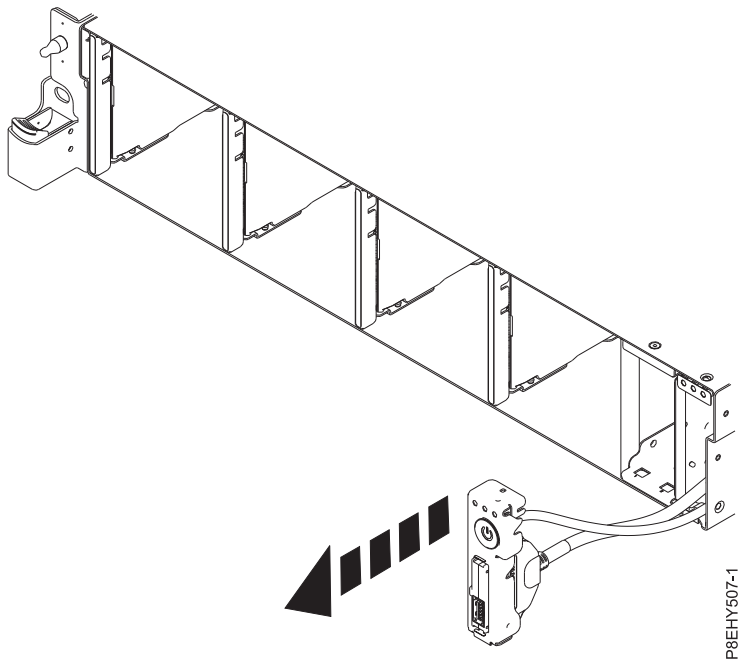
Figure 106. Pull the power switch from the system

10. Pressing the latch releases on the connector **(A)**, disconnect the front USB cable from the power switch. See Figure 107 on page 90.
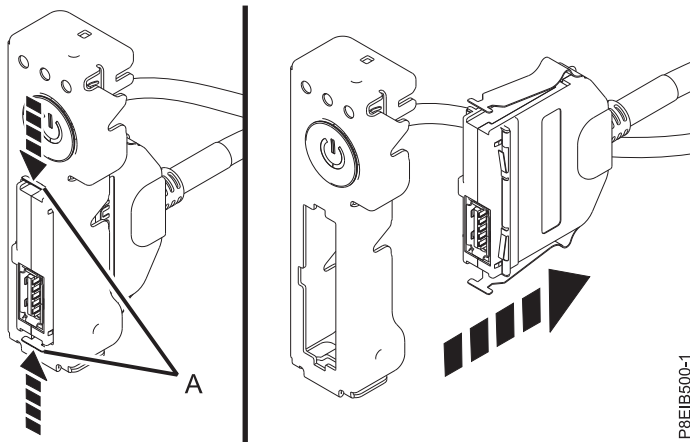
Figure 107. Removing front USB cable from power switch

11. Place the front USB cable and the power switch on the table.

Replacing the power switch and cable in the 8335-GTB system

Learn how to replace the power switch and cable in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Find the replacement power switch and cable and remove it from the protective plastic envelope.
3. Connect the front USB cable to the power switch. Push in the retaining latches **(A)** so that the USB port locks into the power switch. See Figure 108.
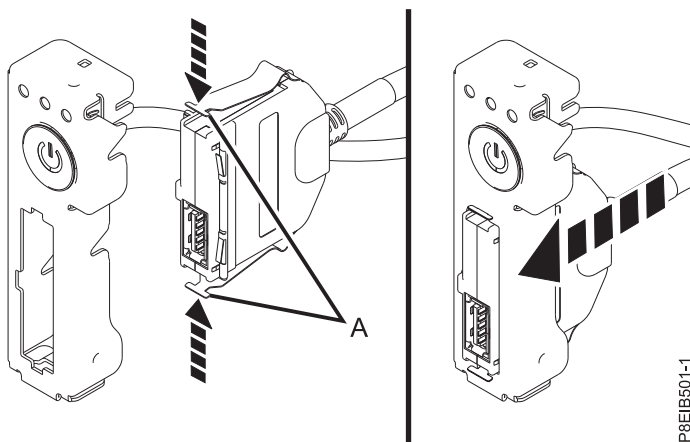
Figure 108. Attaching the front USB cable to the power switch

4. Insert the power switch and cables into the system. Be careful to route the cables through to the system backplane as shown in Figure 109 on page 91.
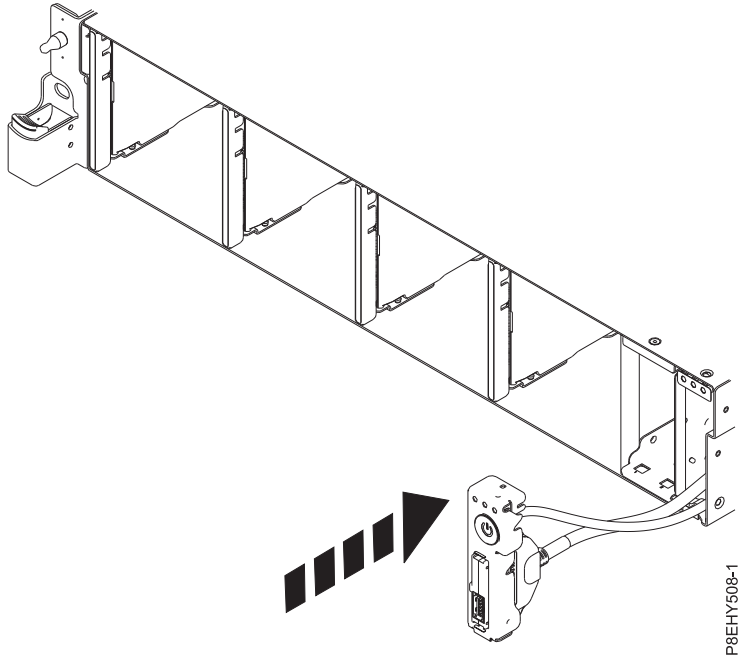
Figure 109. Replacing the power switch and cables

5. Replace the top and side screws for the power switch as shown in Figure 110.
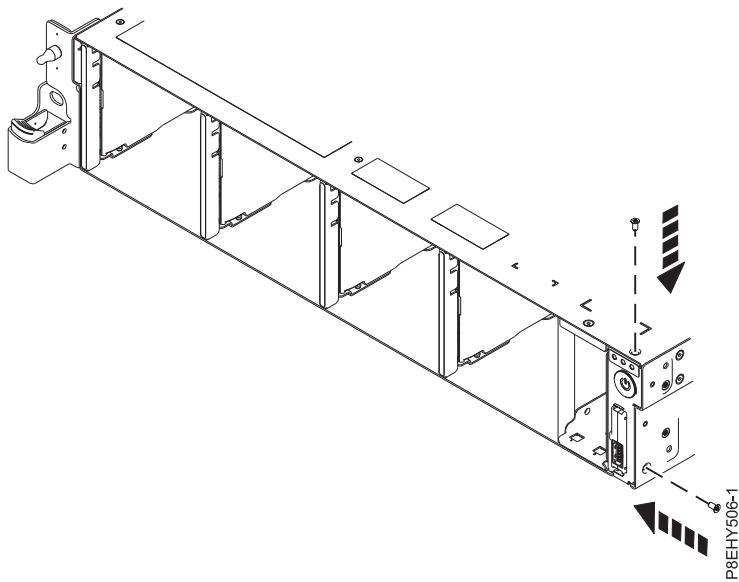
Figure 110. Replace the top and side screws

6. Using the labels, plug the front USB cable **(A)** and the power switch and cable **(B)** to the system backplane as shown in Figure 111 on page 92. Ensure that the cable latch clip snaps into place on the connectors.
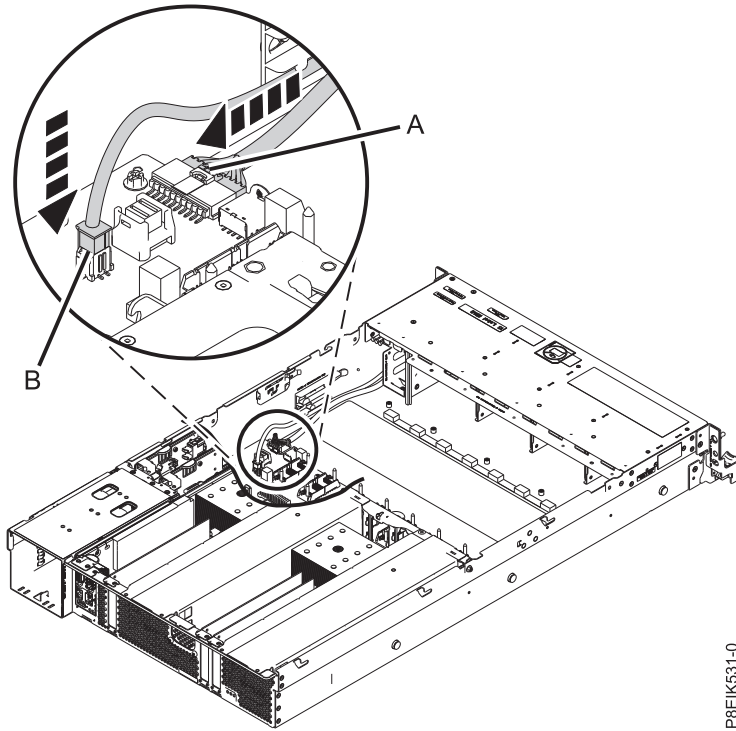
Figure 111. Location of the front USB cable and power switch and cable

7. Replace the rack installation support on the side of the system as shown in Figure 112.
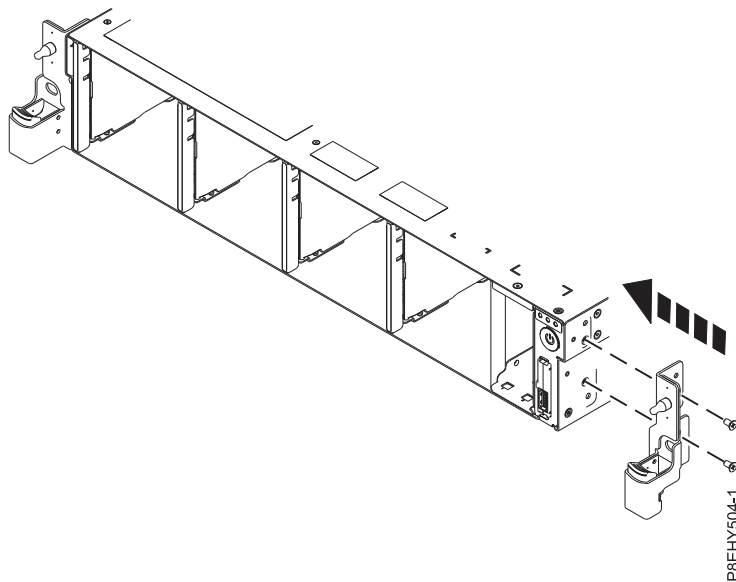
Figure 112. Replacing the rack installation support

8. Secure each cable in the retaining clip on the inside wall of the system.
9. Replace the disk drive and fan card. For instructions, see "Replacing the disk drive and fan card in the 8335-GTB" on page 41.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the BMC card in the 8335-GTB

Learn how to remove and replace the BMC card in the IBM Power System S822LC (8335-GTB) system.

Removing the BMC card from the 8335-GTB

Learn how to remove the BMC card in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. If needed, label and remove the cables from the BMC card.

3. Using the blue tab, open the release latch **(A)** at the socket end of the BMC card as shown in Figure 113 on page 94. Pull up on the blue tab **(B)** at the rear of the card.
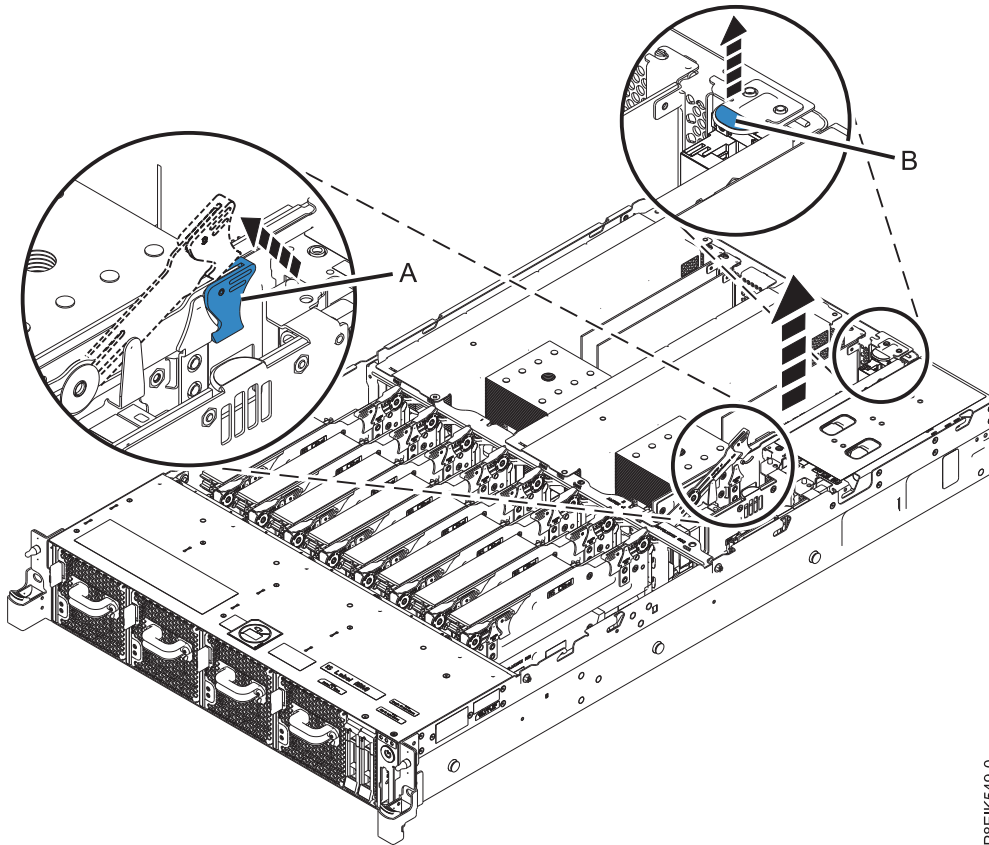
Figure 113. Removing the BMC card

4. Pull out the BMC card from the slot by holding onto the blue tabs on the card.
5. Place the BMC card on an ESD mat.

Replacing the BMC card in the 8335-GTB

Learn how to replace the BMC card in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Ensure that the release latch at the socket end of the BMC card is opened to about a 60-degree angle .
3. Align the BMC card with the connector.
4. Using the blue tab **(A)** and the release latch **(B)** as shown in Figure 114 on page 95, press the BMC card firmly into the connector. Press the release latch **(B)** into the closed position.
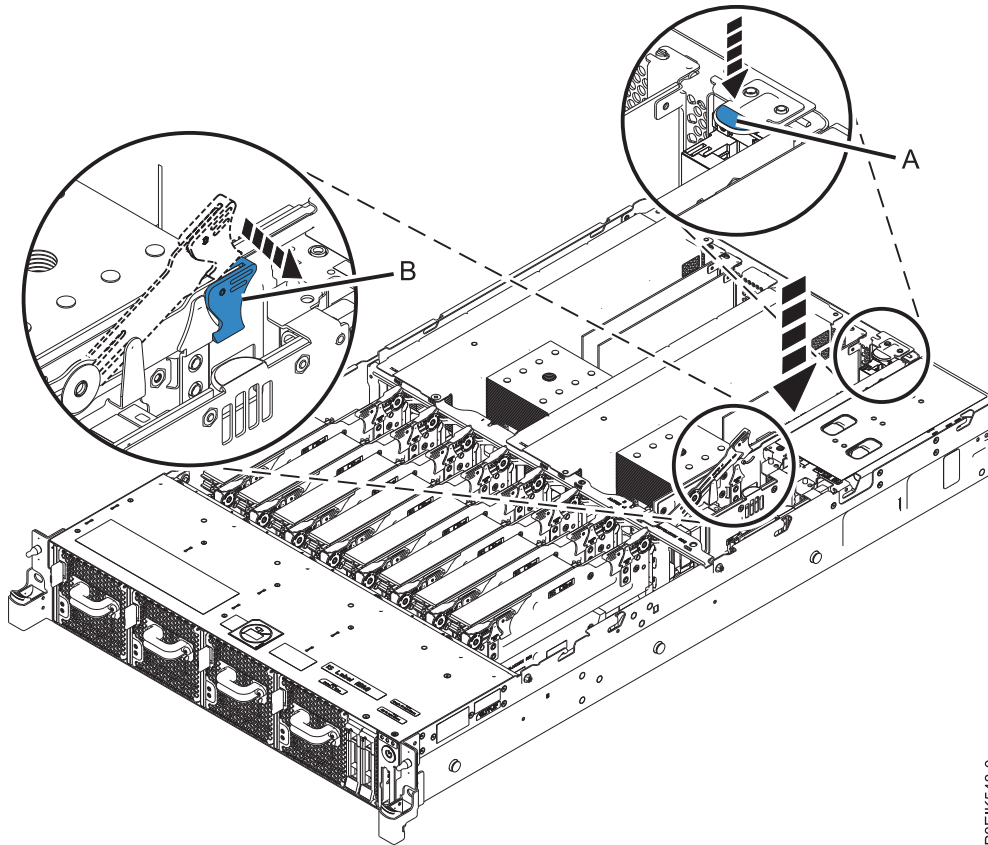
Figure 114. Replacing the BMC card

5. If needed, use your labels to replace the cables in the BMC card.

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the system backplane in the 8335-GTB

Learn how to remove and replace the system backplane in the IBM Power System S822LC (8335-GTB) system.

As part of the system backplane replacement, the system processor modules are moved from the old system backplane to the new system backplane.

Removing and replacing the system backplane in an air-cooled 8335-GTB

Learn how to remove the system backplane in the air-cooled IBM Power System S822LC (8335-GTB) system.

Preparing to remove the system backplane in an air-cooled 8335-GTB

To prepare the air-cooled system to remove a system backplane, complete the steps in this procedure.

Before you begin

Before you begin replacing the system backplane, record the system serial number and machine model type. After you replace the system backplane, you must set the system serial number and machine model type into the replacement system backplane.

After you replace the system backplane, you must set the system serial number in the system backplane by using the vital product data (VPD) update tool. To download the tool, complete the following steps:

1. Go to the IBM Support Portal website(www.ibm.com/support/entry/portal/product/power/scale-out_lc).
2. In the search field, enter your machine type and model. Then, click the correct product support entry for your system.
3. From the Downloads list, click Scale-out LC system VPD update tool.
4. Follow the directions that are provided with the tool to update the VPD.

As part of the system processor module replacement, the heat sink is removed. The system can use two types of thermal interface materials (TIMs); silver with trimmed corners, or gray with square corners.

- When the heat sink is removed from the system processor module, the silver-colored thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the silver-colored TIM is damaged, do not reuse the removed heat sink. Before you begin the removal and replacement procedure, ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.
- If a gray-colored TIM is used and needs replacing, ensure that you have a spare TIM, part number 01AF742, on hand. Alternatively, have a spare TIM and heat sink, part number 01AF286, on hand.

Procedure

1. Create a backup of the BMC by completing the following steps:
   a. Access the BMC GUI from a browser. The user needs Administrator privilege. You can use either Google Chrome or Mozilla Firefox browsers.
   b. Navigate to **Maintenance** > **Backup/Restore Configuration**
   c. Select all items.
   d. Press the **Backup Configuration** button to create the backup.
2. Save the BMC network settings by completing the following steps:
   a. Navigate to **HMC Management** > **Console Settings** > **Change BMC/IPMI Network Settings**
   b. Record the following values:

      IP address
      Subnet mask
      Gateway
3. Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Removing the system backplane from an air-cooled 8335-GTB

Learn how to remove the system backplane from an air-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

2. Remove the power riser air baffle. Using the blue tabs **(A)**, unsnap the baffle and lift it from the system. See Figure 115.

Figure 115. Removing the power riser air baffle

3. Label and remove the fan power cable from the power distribution card. For instructions, see "Removing the fan power cable from the 8335-GTB" on page 48.

4. Remove the power distribution cards. For instructions, see "Removing a power riser from the 8335-GTB" on page 81.

5. Remove the BMC card. For instructions, see "Removing the BMC card from the 8335-GTB" on page 93.

6. Label and remove the graphics processing units (GPUs). For instructions, see "Removing the graphics processing unit from an air-cooled 8335-GTB system" on page 60. You will need to place them on an ESD surface.

7. Label and remove the PCIe adapters. For instructions, see "Removing a PCIe adapter from the system backplane in the 8335-GTB" on page 79.

8. Label and remove the memory risers. For instructions, see "Removing memory risers from the 8335-GTB" on page 75.

9. Label and remove the disk and fan signal cable from the system backplane. For instructions, see "Removing the disk and fan signal cable from the 8335-GTB system" on page 43.

10. Label and remove the front USB cable from the system backplane. For instructions, see "Removing the front USB cable and connector in the 8335-GTB" on page 53.

11. Label and remove the power switch and cable from the system backplane. For instructions, see "Removing the power switch and cable from the 8335-GTB system" on page 86

12. Remove the middle support **(C)**. See Figure 116.

   a. Remove the screw **(B)** from each side of the system.

   b. Remove the four screws **(A)** that connect the middle support to the system backplane.

   c. Lift out the middle support **(C)**.
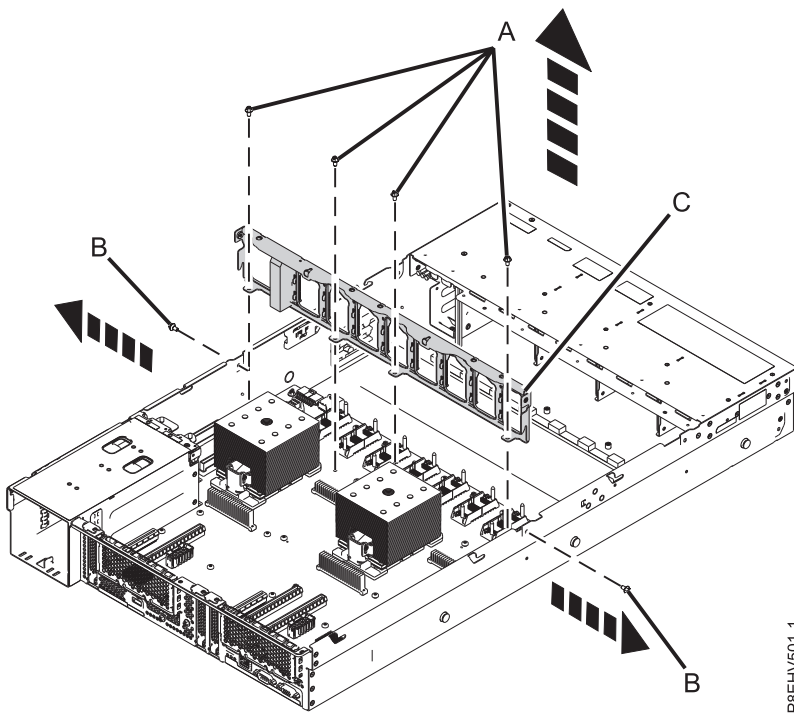
Figure 116. Remove the middle support and screw locations

13. Unscrew and remove 10 black hex screws **(D)** from the system backplane. The screw locations are shown in Figure 117 on page 99.
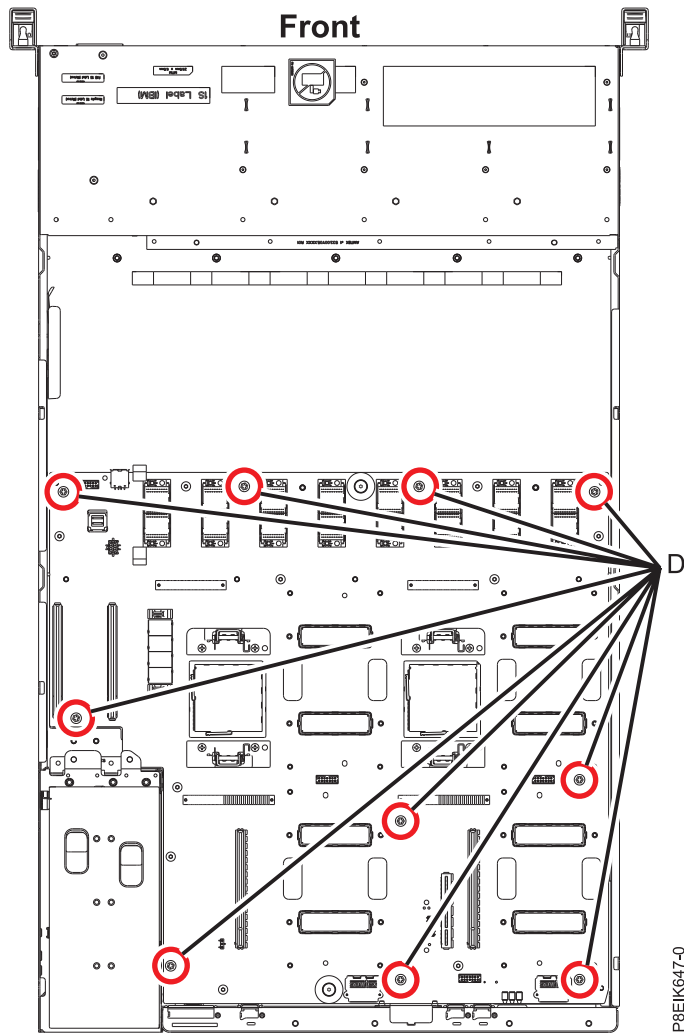
Figure 117. System backplane screw locations

14. Using the blue lift points **(A)**, slide the system backplane **(B)** towards the fans, then lift to remove it. See Figure 118 on page 100.
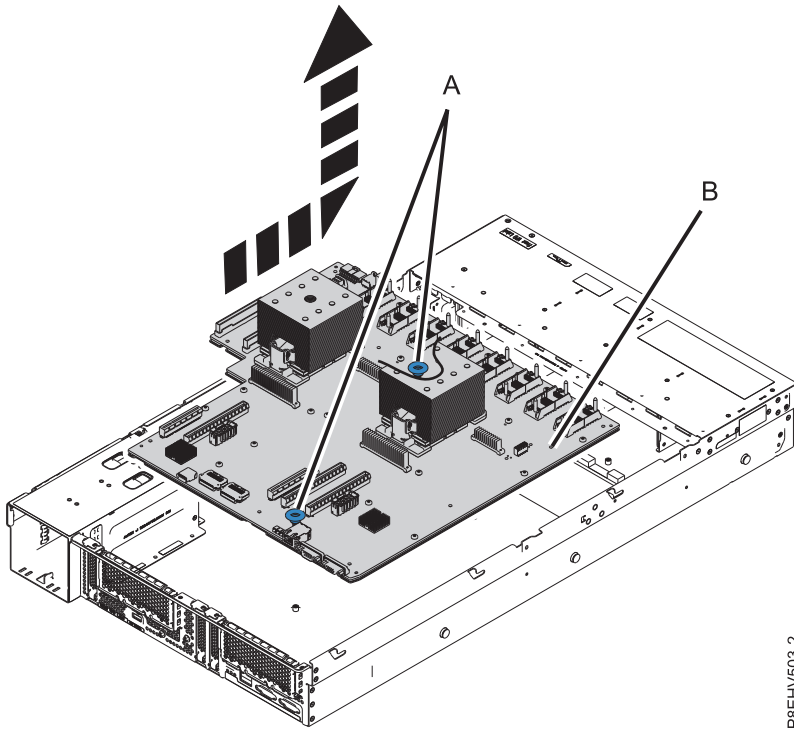
Figure 118. Lifting out the system backplane

15. Place the system backplane on the ESD mat.

Replacing the system backplane in an air-cooled 8335-GTB

Learn how to replace the system backplane in an air-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove the replacement system backplane from the static-protective package and place it on an ESD mat.
3. Using the blue lift points **(A)**, lower the system backplane **(B)** into the system, sliding it to the back of the system. Ensure that the connectors align and pass through the rear of the system.
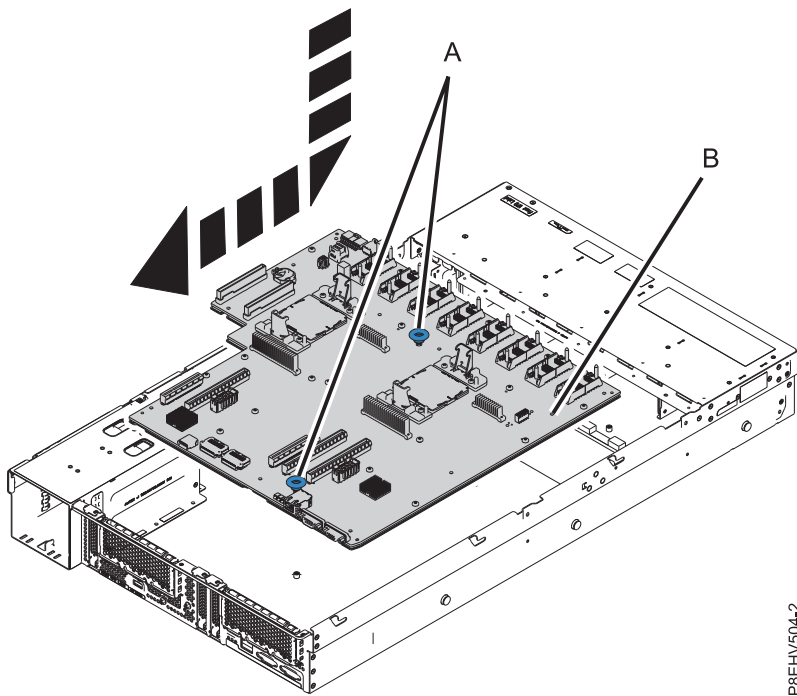
Figure 119. Lowering the system backplane into the system and sliding it to the back of the system.

4. Align and screw the 10 black hex screws **(D)** into the system backplane. The screw locations are shown in Figure 120 on page 102.
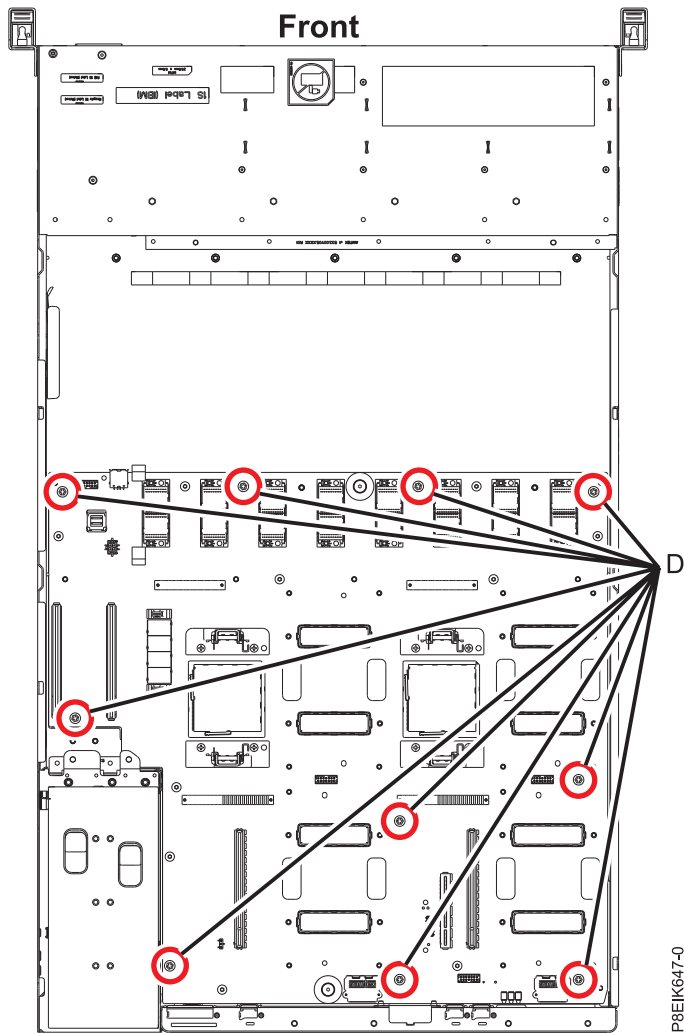
Figure 120. System backplane screw locations

5. Ensure that the jumper shown in Figure 121 on page 103 is set to the air cooled position.
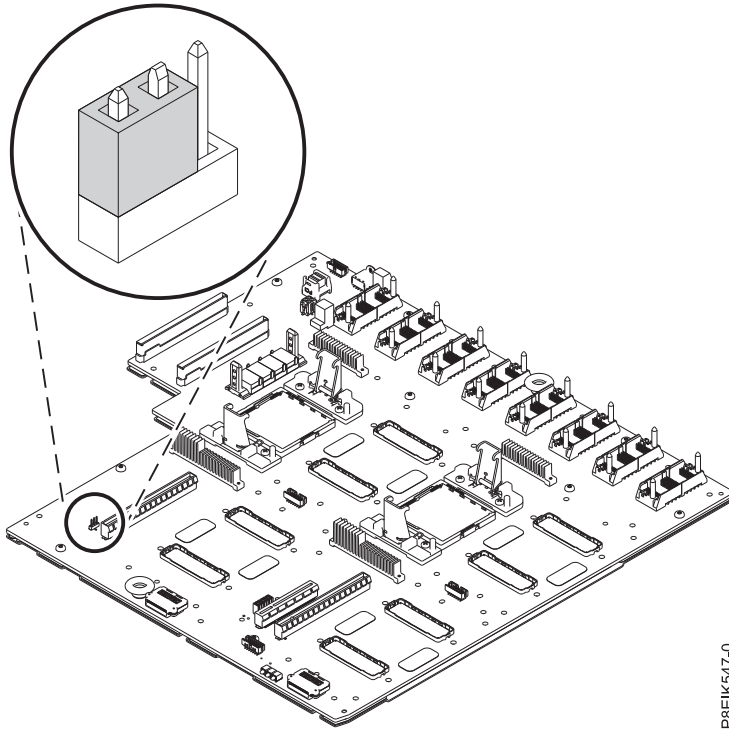
Figure 121. Jumper in air-cooled position

6. Replace the middle support **(C)**. See Figure 122 on page 104.
   a. Lower the middle support **(C)** into place.
   b. Replace the screw **(E)** on the side of the system; one on each side.
   c. Replace the four screws **(D)** that connect the middle support to the system backplane.
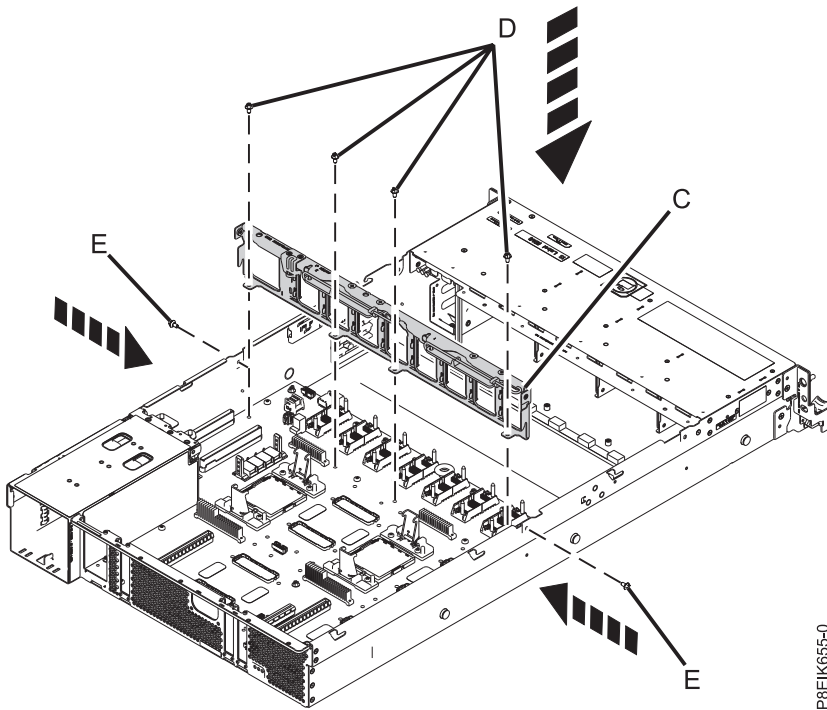
Figure 122. Replacing the middle support

These next steps move the system processor modules from the old system backplane to the new system backplane you installed:

7. Begin the process of transferring the system processors, one at a time.
8. Remove the heat sink from the system processor module:

    a. Loosen the heat sink actuation screw by turning the supplied hex key counterclockwise **(A)**. Loosen the screw until it moves freely. See Figure 123 on page 105.

    b. Grip the heat sink **(B)** on opposing sides and remove the heat sink by lifting it upward. Set the heat sink aside with the module side facing upward.

    Note: If you plan to remove dust or debris from the heat sink, this operation must be done in another room that is greater than 7.6 m (24.9 ft) away from the work area.
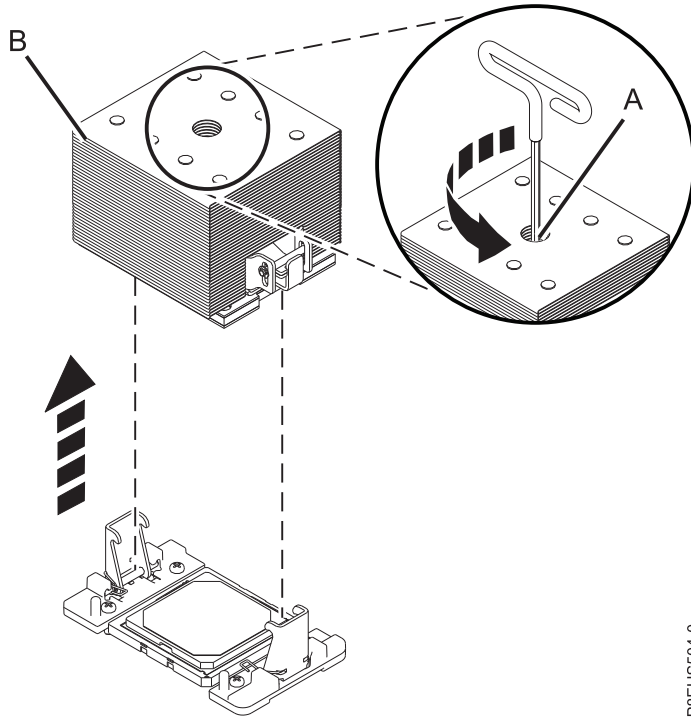
Figure 123. Removing the heat sink

9. If the system uses the gray-colored thermal interface material (TIM): Using the tweezers, remove the gray-colored TIM from the top of the processor and place it in a clean, dry area as shown in Figure 124 on page 106. The system can use two types of TIMs. One TIM is silver-colored with trimmed corners and typically adheres to the heat sink. The other is TIM is dark gray with square corners and does not adhere. The gray-colored TIM needs to be removed before the processor is removed.
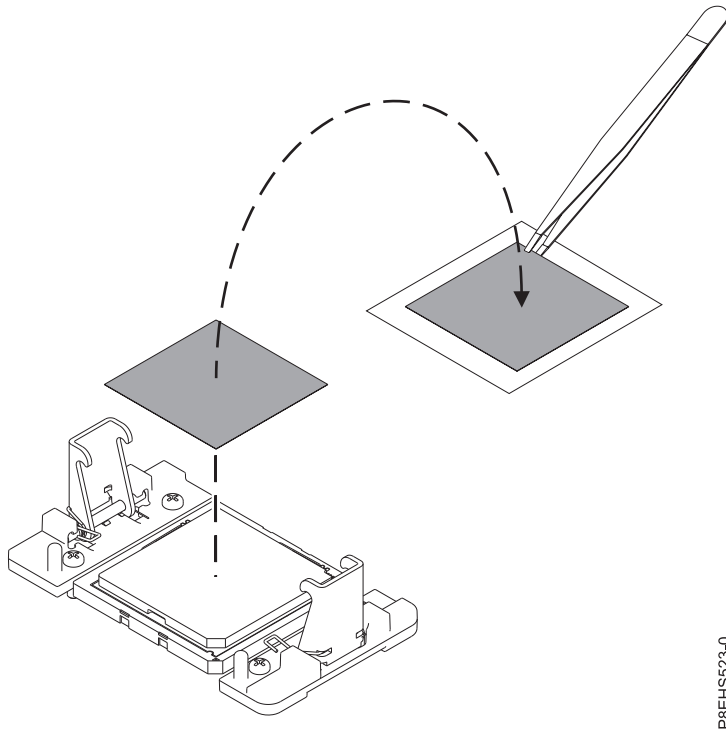
P8EHS523-0

Figure 124. Removing the gray-colored TIM from the processor

10. Remove dust and debris from the system processor module area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor module area. Blow small bursts of air from the center toward the sides of the system processor module as shown in Figure 125 on page 107. If your air pump is not assembled as shown in Figure 125 on page 107, fasten the tip onto the bulb.
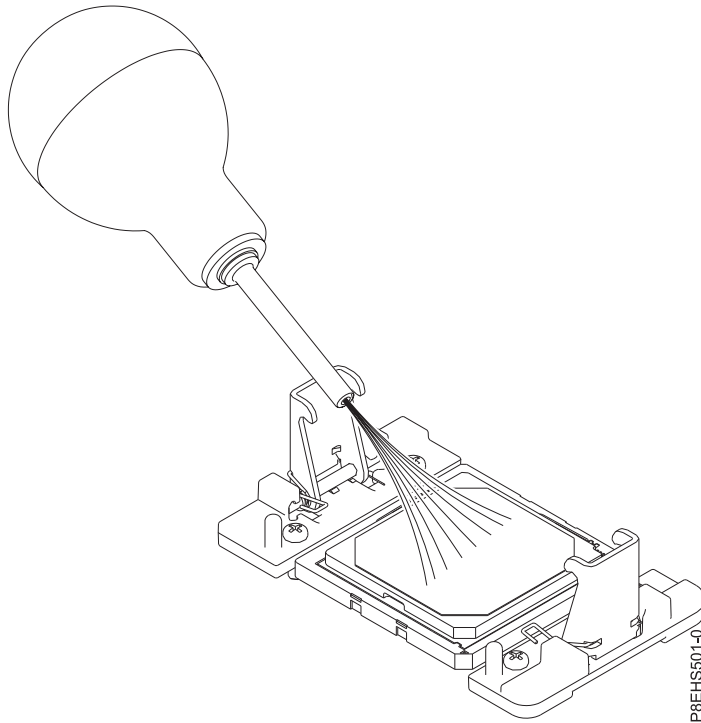
Figure 125. Removing dust and debris from the system processor module area

11. On the new system backplane, remove the socket cover from a system processor socket.
12. Prepare the system processor module for removal.
    a. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the system processor module as shown in Figure 126 on page 108.
    b. Lower the tool over the system processor module by ensuring the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool.
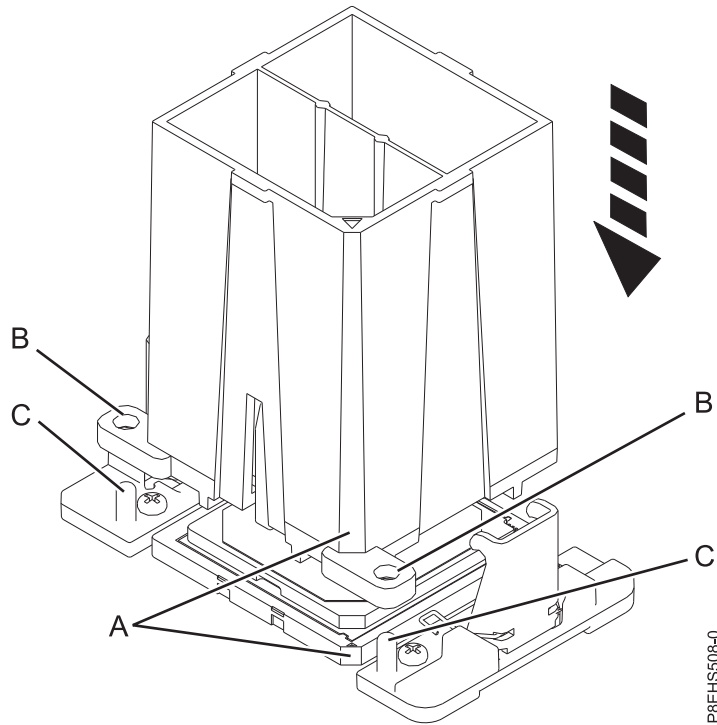
Figure 126. Lowering the removal tool onto the system processor module

    c. With the removal tool **(A)** sitting on top of the system processor module, push down on the tool to lock the system processor module into the tool as shown in Figure 127 on page 109. Make sure that both of the tool jaws are locked on the system processor module. Do not press the blue release tabs until directed to do so later.

        Note: The tool drops slightly when you push down on the processor module so that the jaws can grab the bottom of the module.
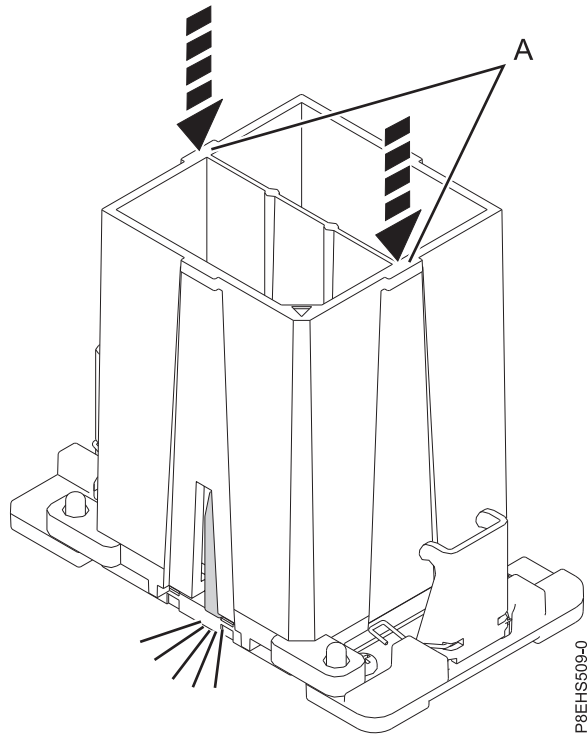
Figure 127. Locking the system processor module into the tool

13. Holding the outside of the tool, lift the tool and system processor module from the old system backplane socket to transfer it to the new system backplane socket.

14. Install the system processor module:

    a. If dust or debris is present on the system processor socket, use the supplied air pump (part number 45D2645) to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown Figure 128 on page 110.

P8EDE529-0
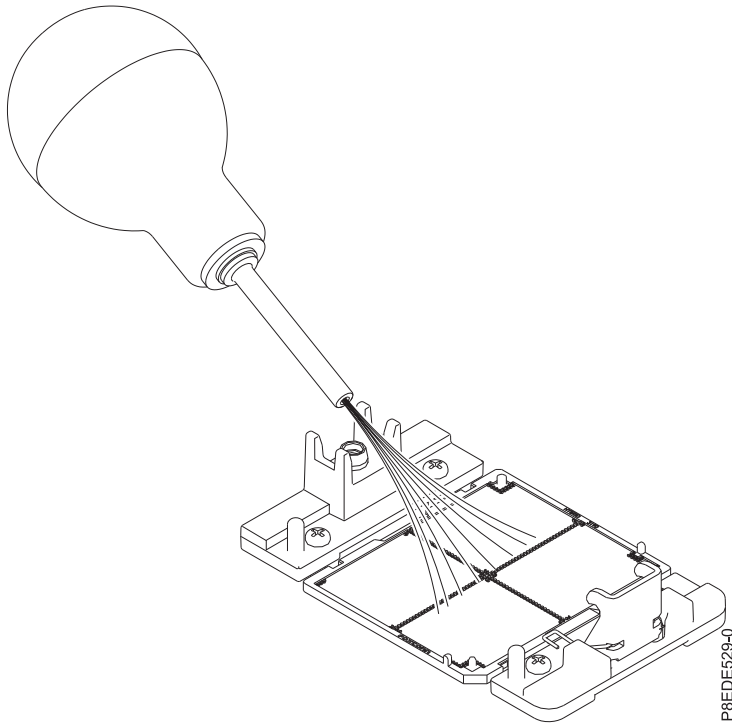
Figure 128. Removing dust and debris from the system processor socket

    b. Lower the tool and system processor module onto the socket. Align the beveled corner **(A)** of the tool with the beveled corner on the socket. Ensure that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool. See Figure 129 on page 111.

        Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.
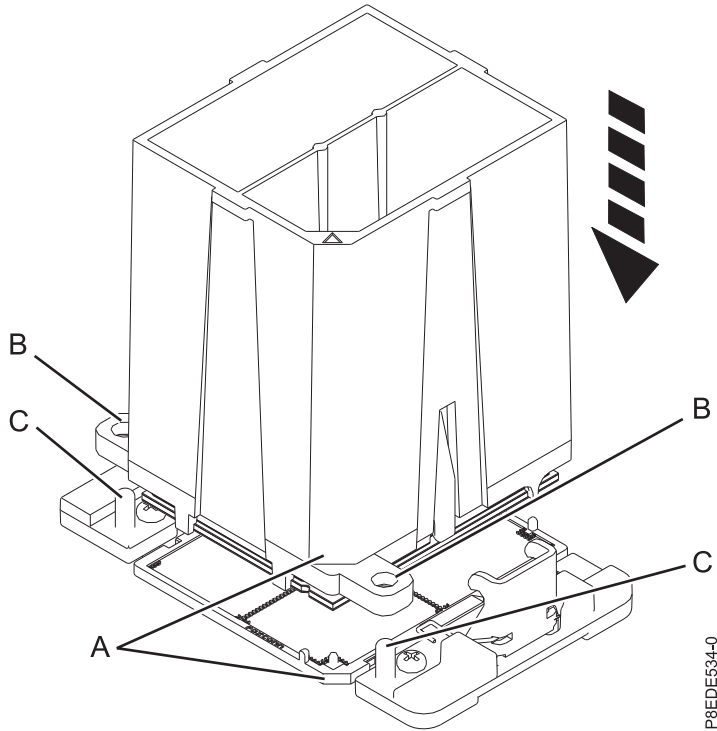
Figure 129. Installing the system processor module

    c. After the tool and system processor module holes and guide pins are properly aligned, squeeze and hold the two blue release tabs **(A)** together until a firm stop is reached, as shown in Figure 130 on page 112. Then, lift the tool off the system processor module.
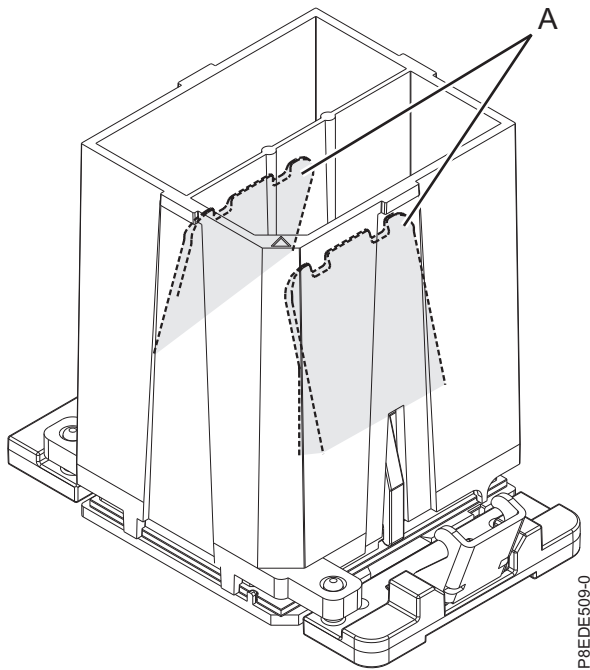
Figure 130. Removing the system processor module tool

15. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in Figure 131 on page 113 or Figure 132 on page 113. If you see folds, tears, bends, or if you have doubts about the TIM, replace it.

    The system can use two types of thermal interface materials (TIMs).

    • One TIM is silver-colored with trimmed corners and a red line, part number 44V8038.

      The silver-colored TIM is typically adhered to the heat sink. Unless damaged, the silver-colored TIM that is adhered to the heat sink can be reused. If the silver-colored TIM is damaged, use the supplied scraper to remove the TIM. If you cannot remove the damaged TIM from the heat sink, you will need to replace both the silver TIM and heat sink. Ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.

    • The other is TIM is dark gray with square corners, part number 01AF742.

      The dark gray TIM can be reused unless it is damaged. You will need to move it to the new system processor module.

Figure 131. Inspecting the silver-colored thermal interface material
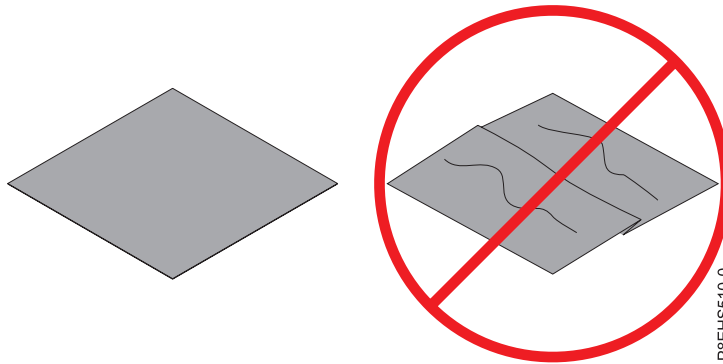
Figure 132. Inspecting the gray-colored thermal interface material

16. Choose one of the following repair options:

Option	Description
Is the silver-colored TIM damaged?	It is damaged. Proceed to step 17 on page 114 to replace both the silver-colored TIM and heat sink.
Is the silver-colored TIM not damaged?	It is not damaged and can be reused. Proceed to step 18 on page 115 to install the existing silver-colored TIM and heat sink.
Is the gray-colored TIM damaged?	It is damaged. Proceed to step 19 on page 116 to replace the gray-colored TIM and install the existing heat sink.
Is the gray-colored TIM not damaged?	It is not damaged and can be reused. Proceed to step 20 on page 118 to move the gray-colored TIM and install the existing heat sink.

17. Use this step to install a new silver-colored TIM and heat sink.

    a. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

    b. Remove the protective film from the clear carrier strip by using the supplied tweezers.

        Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

    c. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The silver-colored TIM must have the red stripe up. Align the beveled edges of the silver-colored TIM and the system processor module **(A)**, as shown in Figure 133.

Figure 133. Installing the silver-colored TIM onto the processor. The red stripe must be up.

    d. Place the new heat sink on the TIM as shown in Figure 134 on page 115.
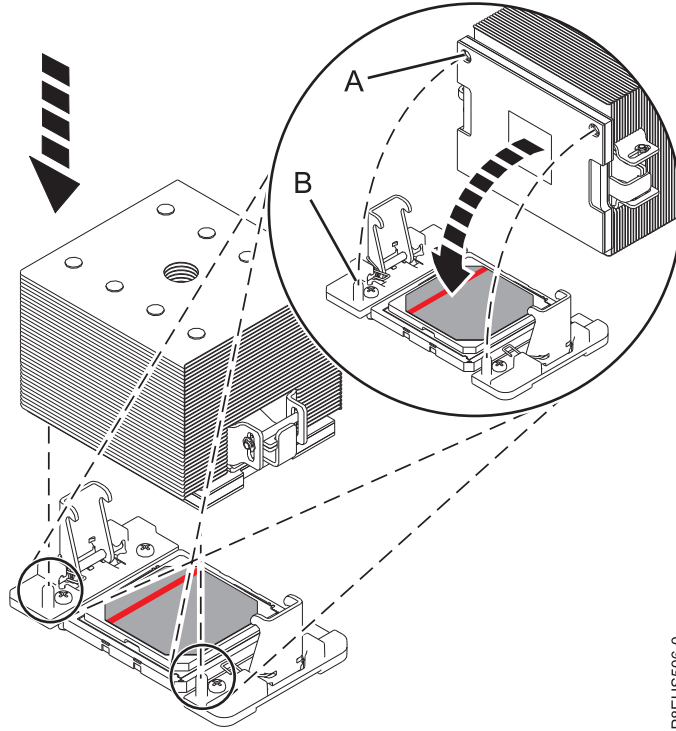
Figure 134. Installing the new heat sink on the silver-colored TIM

Continue with step 21 on page 119.

18. Use this step to reuse the existing undamaged silver-colored TIM and heat sink. The undamaged silver TIM is adhered to the heat sink. Both need to be placed on the processor as shown in Figure 135 on page 116.
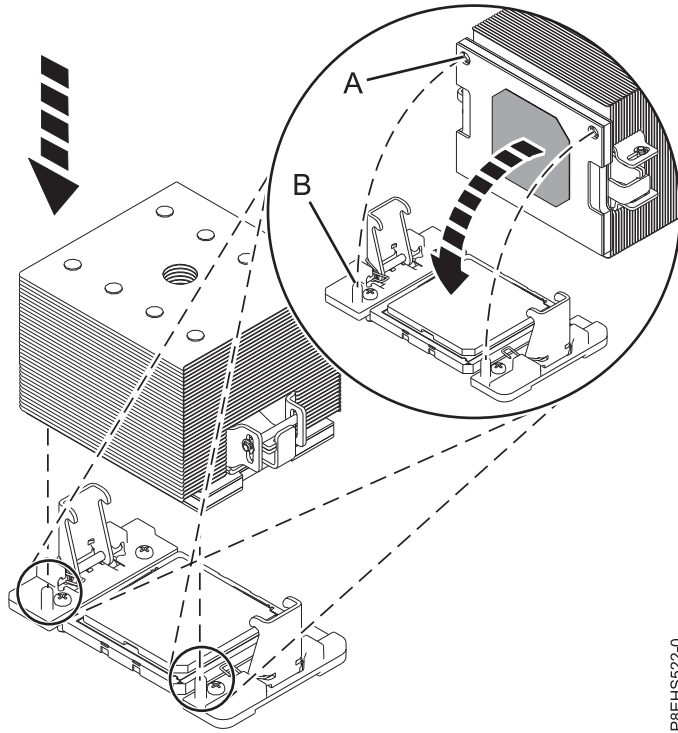
Figure 135. Reusing the undamaged silver-colored TIM and heat sink

Continue with step 21 on page 119.

19. Use this step to install a new gray-colored TIM and reuse the existing heat sink.

    a. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

    b. Remove the protective film from the clear carrier strip by using the supplied tweezers.

       Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

    c. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The gray-colored TIM has no preferred up side. The gray-colored TIM can be placed on the processor and centered as shown in Figure 136 on page 117.
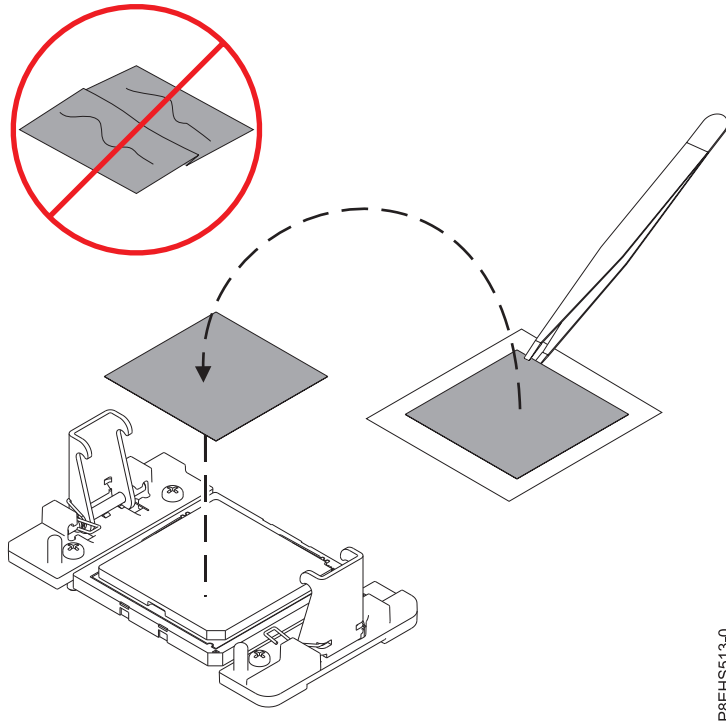
Figure 136. Installing a new gray-colored TIM onto the processor. The gray colored TIM has no preferred up side.

    d. Place the heat sink on the TIM as shown in Figure 137.
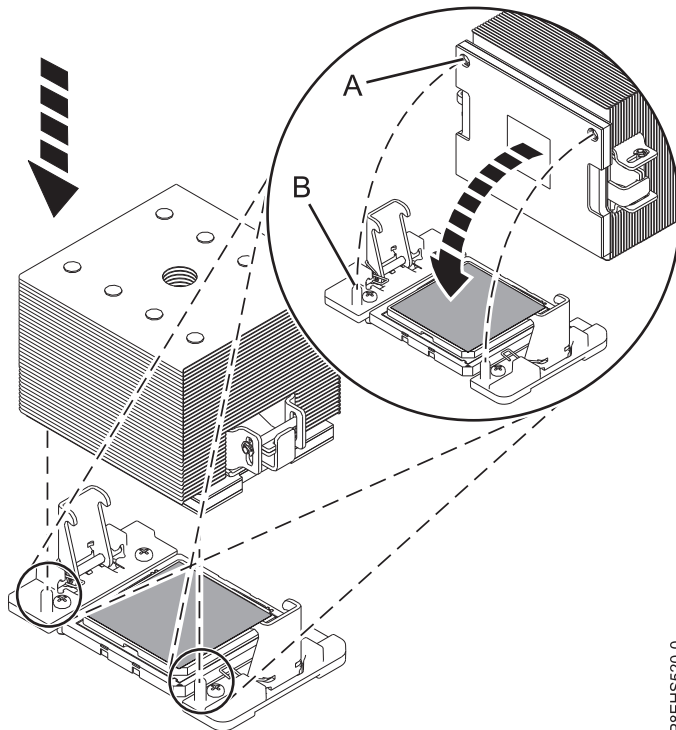
Figure 137. Installing the heat sink on the gray-colored TIM

20. Use this step to reuse the existing undamaged gray-colored TIM and heat sink.
   a. Using the tweezers, move the old processor's TIM from the clean, dry surface and center it onto the new system processor module. The gray-colored TIM has no preferred up side. The gray-colored TIM can be placed on the processor and centered as shown in Figure 138.
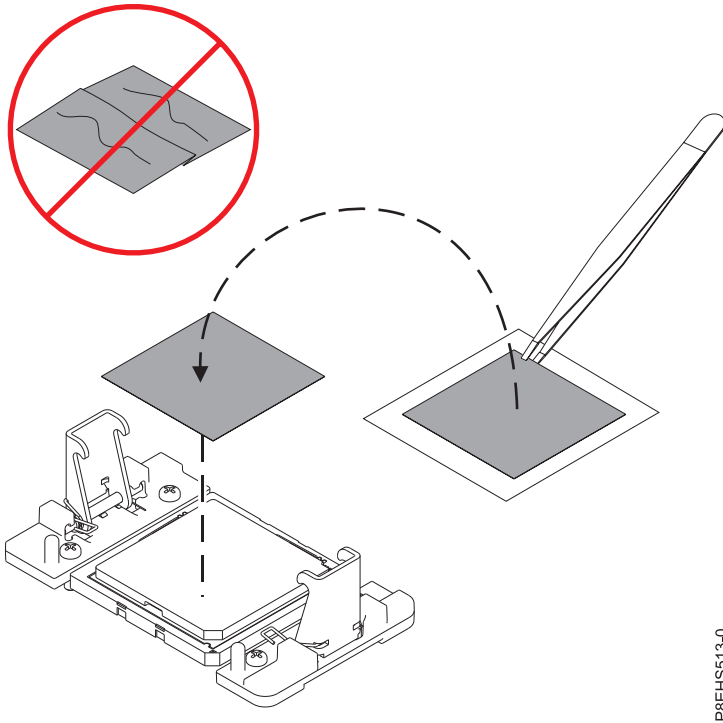
Figure 138. Moving the gray-colored TIM onto the processor. The gray colored TIM has no preferred up side.

   b. Place the heat sink on the TIM as shown in Figure 139 on page 119.
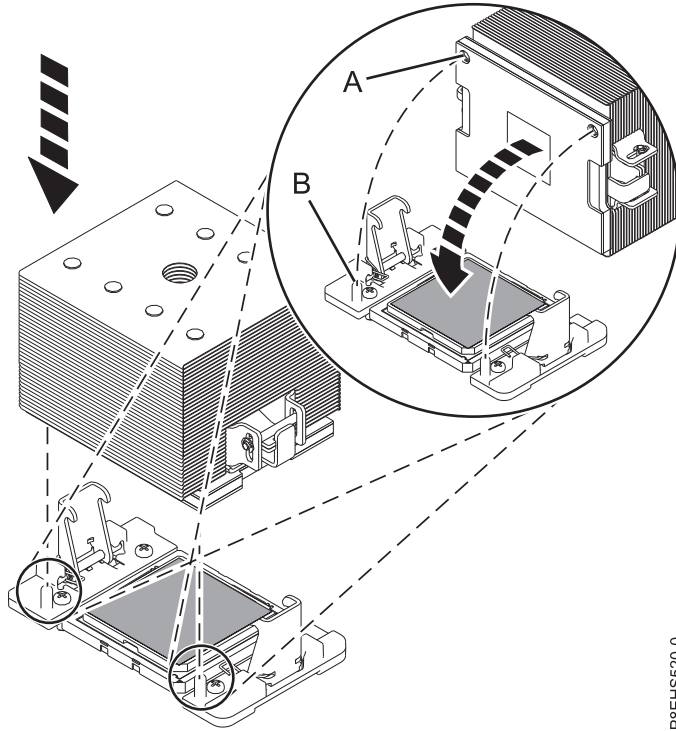
Figure 139. Installing the heat sink on the gray-colored TIM

Continue with step 21.

21. Secure the TIM and heat sink to the processor socket.

   a. Ensure that the heat sink load arms are engaged as shown by **(A)** in Figure 140.

   b. Tighten the center load screw clockwise by using the supplied hex key as shown by **(B)** in Figure 140 until a firm stop is reached. If the heat sink moves noticeably, the load arms are not engaged. Unscrew the center load screw and repeat this step again.
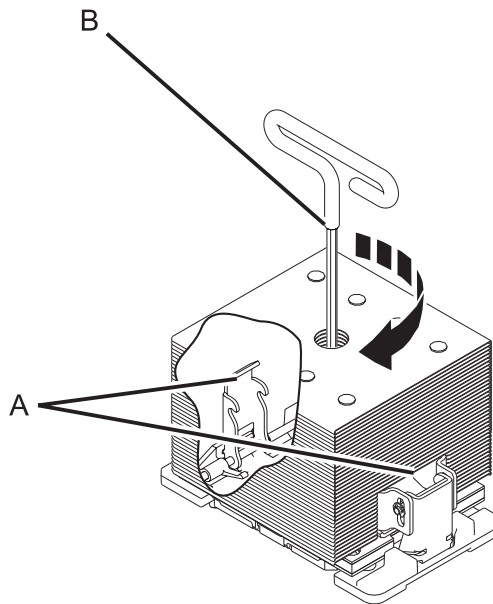
Figure 140. Tightening the center load screw on the heat sink

22. Repeat from step 7 on page 104 with the other system processor module

These next steps continue installing components into the new system backplane:

23. Replace the power distribution cards. For instructions, see "Replacing a power riser in the 8335-GTB" on page 84.

24. Using your labels, replace the fan power cable into that connector in the power distribution card. For instructions, see "Replacing the 8335-GTB fan power cable" on page 51.

25. Using your labels, replace the front USB cable into that connector in the system backplane. For instructions, see "Replacing the front USB cable and connector in the 8335-GTB" on page 57.

26. Using your labels, replace the power switch and cable into that connector in the system backplane. For instructions, see "Replacing the power switch and cable in the 8335-GTB system" on page 90.

27. Using your labels, replace the disk and fan signal cable into that connector in the system backplane. For instructions, see "Replacing the disk and fan signal cable in the 8335-GTB system" on page 45.

28. Using your labels, replace the memory cards For instructions, see "Replacing memory risers in the 8335-GTB" on page 77.

29. Using your labels, replace the PCIe adapter cards. For instructions, see "Replacing a PCIe adapter in the system backplane in the 8335-GTB" on page 80.

30. Using your labels, replace the graphic processing units (GPUs). For instructions, see "Replacing the graphics processing unit in an air-cooled 8335-GTB system" on page 61.

31. Replace the BMC card. For instructions, see "Replacing the BMC card in the 8335-GTB" on page 94.

32. Install the power riser air baffle. Ensure that the holes in the baffle align with the pins on the system. Using the blue tabs **(C)**, insert the edge **(A)** of the baffle into the side of the system **(B)**. Then snap the baffle down into place. See Figure 141.
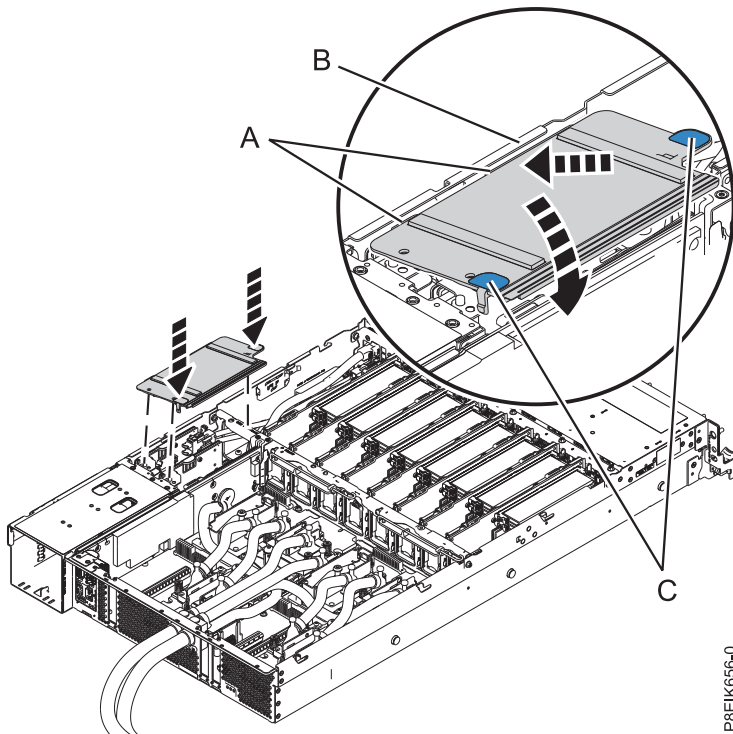
Figure 141. Installing the power riser air baffle

Preparing the system for operation after removing and replacing the system backplane in an air-cooled 8335-GTB

To prepare an air-cooled system for operation after replacing a system backplane, complete the steps in this procedure.

Procedure

1. Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

2. Verify that the jumper is set to air-cooled by using the `ipmitool` command:

```
ipmitool -I lanplus -U <username> -P <password> -H <bmc ip or hostname> sensor list | grep "Water Cooled"
```

   The value for the air-cooled jumper setting is `0x0080` for the `Water Cooled` status:

```
Water Cooled | 0x0 | discrete | 0x0080| na | na | na | na | na | na
```

   If the value returned is `0x0180`, which indicates a water-cooled setting, you must correct the jumper setting as shown in "Replacing the system backplane in an air-cooled 8335-GTB" on page 100.

3. Set the system serial number in the system backplane.

   After you replace the system backplane, you must set the system serial number in the system backplane by using the vital product data (VPD) update tool. To download the tool, complete the following steps:

   a. Go to the IBM Support Portal website(www.ibm.com/support/entry/portal/product/power/scale-out_lc).

   b. In the search field, enter your machine type and model. Then, click the correct product support entry for your system.

   c. From the Downloads list, click Scale-out LC system VPD update tool.

   d. Follow the directions that are provided with the tool to update the VPD.

4. Restore the BMC network settings by completing the following steps:

   a. Access the BMC GUI from a browser. The user needs Administrator privilege. You can use either Google Chrome or Mozilla Firefox browsers.

   b. Navigate to **HMC Management** > **Console Settings** > **Change BMC/IPMI Network Settings**

   c. Set the following values:

```
IP address
Subnet mask
Gateway
```

5. Update the BMC firmware.

   After you replace a system backplane, you must update the BMC firmware. To download the update, go to the Fix Central website (www.ibm.com/support/fixcentral/). Follow the instructions provided with the update.

Removing and replacing the system backplane in a water-cooled 8335-GTB

Learn how to remove the system backplane in the water-cooled IBM Power System S822LC (8335-GTB) system.

Preparing to remove the system backplane from a water-cooled 8335-GTB

To prepare the water-cooled system to remove a system backplane, complete the steps in this procedure.

Before you begin

Before you begin replacing the system backplane, record the system serial number and machine model type. After you replace the system backplane, you must set the system serial number and machine model type into the replacement system backplane.

After you replace the system backplane, you must set the system serial number in the system backplane by using the vital product data (VPD) update tool. To download the tool, complete the following steps:

1. Go to the IBM Support Portal website(www.ibm.com/support/entry/portal/product/power/scale-out_lc).
2. In the search field, enter your machine type and model. Then, click the correct product support entry for your system.
3. From the Downloads list, click Scale-out LC system VPD update tool.
4. Follow the directions that are provided with the tool to update the VPD.

As part of the system backplane replacement, the cold plate is removed from the system processor module. When the cold plate is removed from the system processor module, the thermal interface material (TIM) is typically adhered to the cold plate. Unless damaged, the TIM that is adhered to the cold plate can be reused. If the TIM is damaged, it will need to be replaced. Before you begin the processor removal and replacement procedure, ensure that you have a spare TIM on hand.

Procedure

1. Create a backup of the BMC by completing the following steps:
   a. Access the BMC GUI from a browser. The user needs Administrator privilege. You can use either Google Chrome or Mozilla Firefox browsers.
   b. Navigate to **Maintenance** > **Backup/Restore Configuration**
   c. Select all items.
   d. Press the **Backup Configuration** button to create the backup.
2. Save the BMC network settings by completing the following steps:
   a. Navigate to **HMC Management** > **Console Settings** > **Change BMC/IPMI Network Settings**
   b. Record the following values:

      IP address
      Subnet mask
      Gateway
3. Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Removing the system backplane from a water-cooled 8335-GTB

Learn how to remove the system backplane in the water-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.
   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Remove the power riser air baffle. Using the blue tabs **(A)**, unsnap the baffle and lift it from the system. See Figure 142 on page 123.
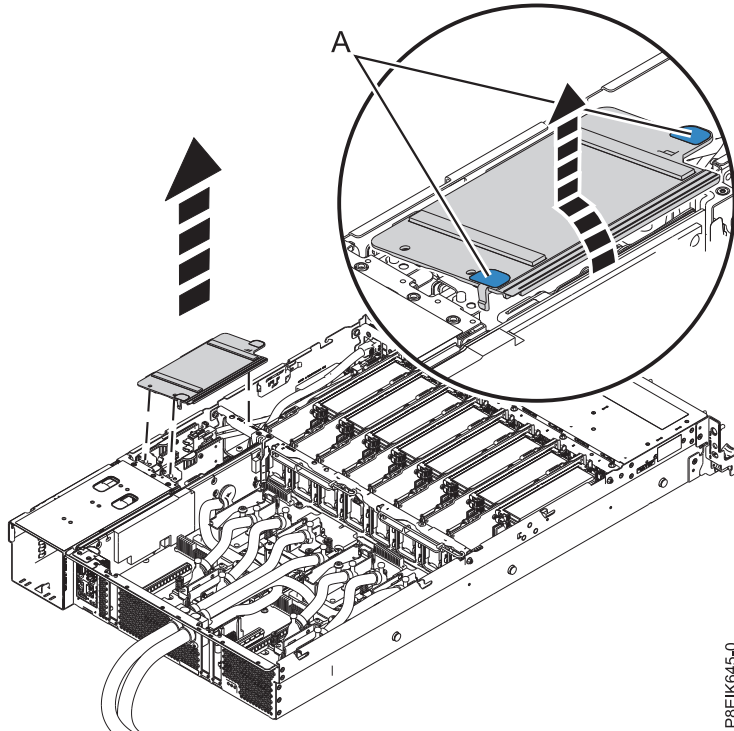
Figure 142. Removing the power riser air baffle

3. Label and remove the fan power cable from the power distribution card. For instructions, see "Removing the fan power cable from the 8335-GTB" on page 48.

4. Remove the power distribution cards. For instructions, see "Removing a power riser from the 8335-GTB" on page 81.

5. Remove the BMC card. For instructions, see "Removing the BMC card from the 8335-GTB" on page 93.

6. Label and remove the PCIe adapters. For instructions, see "Removing a PCIe adapter from the system backplane in the 8335-GTB" on page 79.

7. Label and remove the memory risers. For instructions, see "Removing memory risers from the 8335-GTB" on page 75.

8. Label and remove the disk and fan signal cable from the system backplane. For instructions, see "Removing the disk and fan signal cable from the 8335-GTB system" on page 43.

9. Label and remove the front USB cable from the system backplane. For instructions, see "Removing the front USB cable and connector in the 8335-GTB" on page 53.

10. Label and remove the power switch and cable from the system backplane. For instructions, see "Removing the power switch and cable from the 8335-GTB system" on page 86

11. Remove the cold plates. For instructions, see "Removing the cold plates from the 8335-GTB system" on page 3.

12. Label and remove all the graphics processing units (GPUs). For instructions, see "Removing the graphics processing unit from a water-cooled 8335-GTB system" on page 62. You will need to place them on an ESD surface.

13. Label and remove all the system processor modules. For instructions, see "Removing a system processor module from a water-cooled 8335-GTB system" on page 155. You will need to place them in module carriers on an ESD surface.

14. Remove the middle support **(C)**. See Figure 143 on page 124.

   a. Remove the screw **(B)** from each side of the system.

b. Remove the four screws **(A)** that connect the middle support to the system backplane.

c. Lift out the middle support **(C)**.
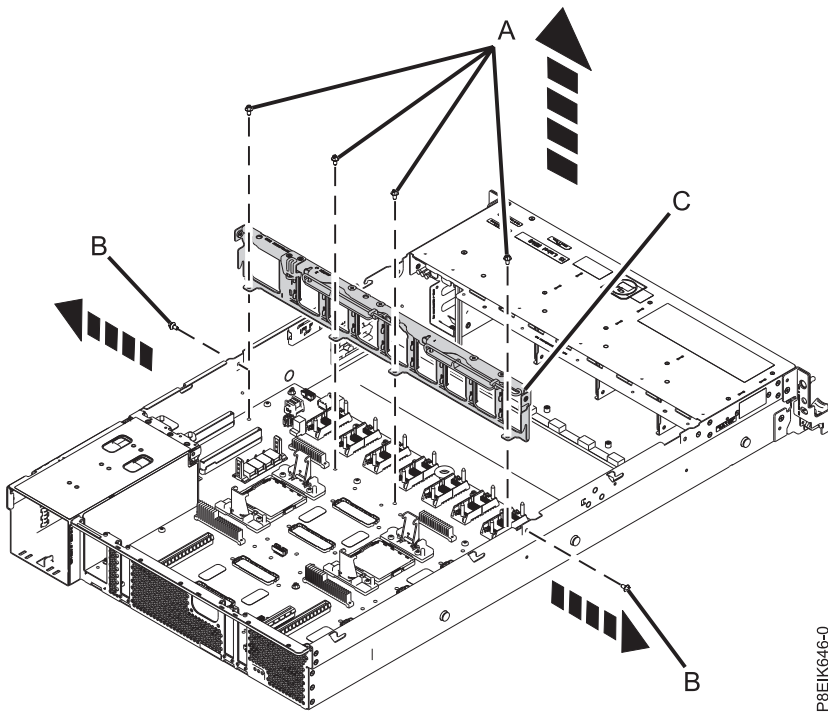
Figure 143. Remove the middle support and screw locations

15. Unscrew and remove 10 black hex screws **(D)** from the system backplane. The screw locations are shown in Figure 144 on page 125.

Front
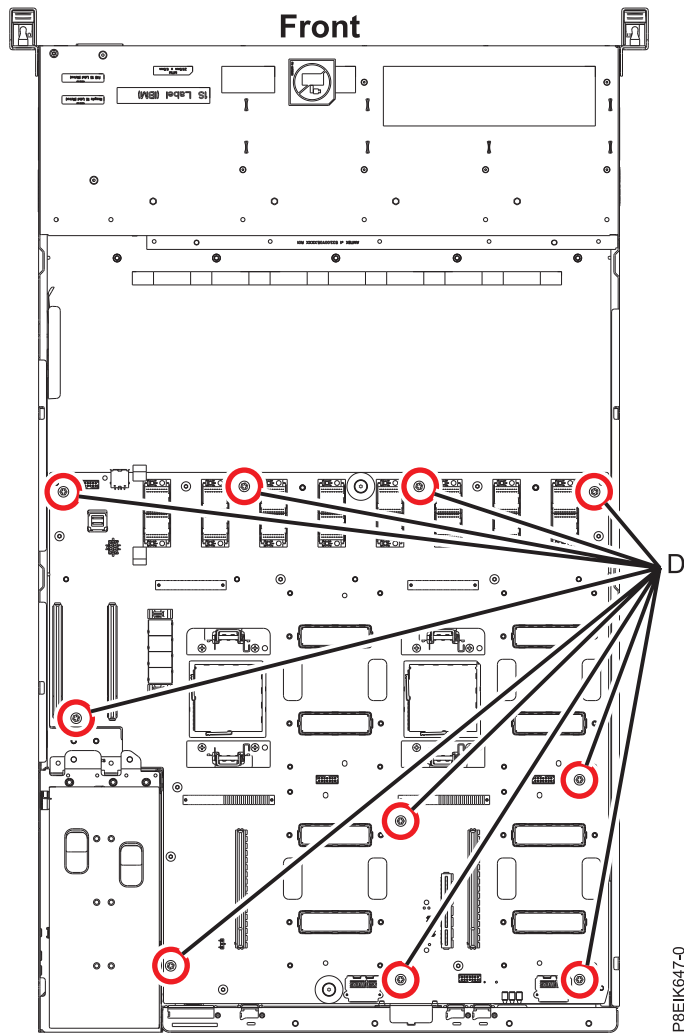
Figure 144. System backplane screw locations

16. As shown in Figure 145 on page 126, using the blue lift points **(A)**, slide the system backplane **(B)** towards the fans, then lift to remove it.
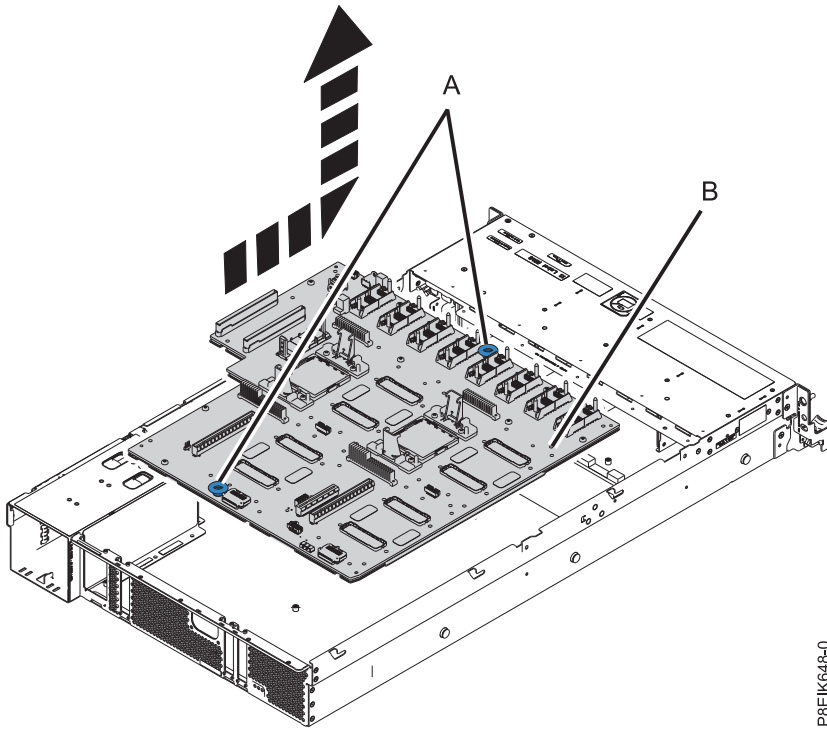
Figure 145. Lifting out the system backplane

17. Place the system backplane on the ESD mat.

Replacing the system backplane in a water-cooled 8335-GTB

Learn how to replace the system backplane in the water-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove the replacement system backplane from the static-protective package and place it on an ESD mat.
3. As shown in Figure 146 on page 127, using the blue lift points **(A)**, lower the system backplane **(B)** into the system, sliding it to the back of the system. Ensure that the connectors align and pass through the rear of the system.
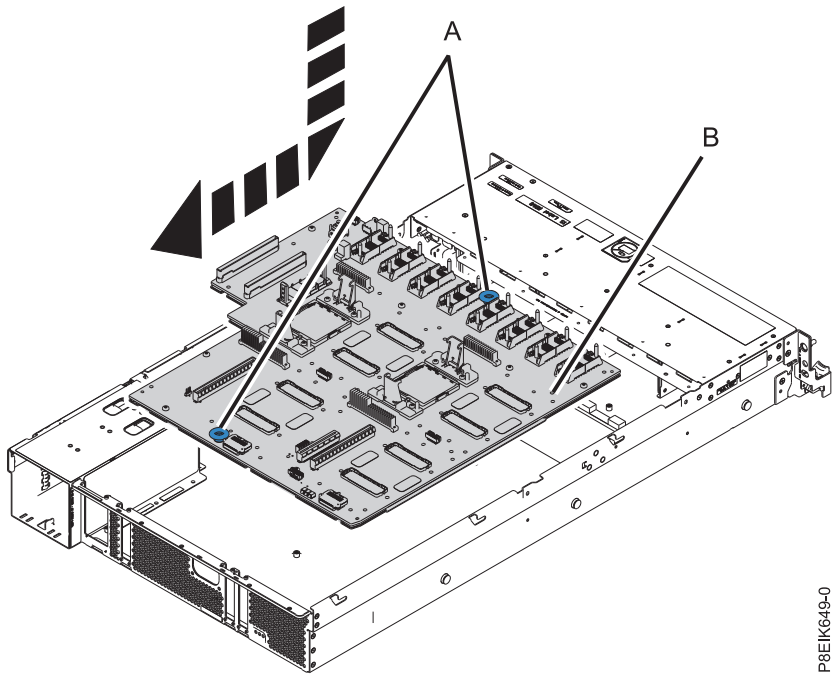
Figure 146. Lowering the system backplane into the system and sliding it to the back of the system.

4. Align and screw the 10 black hex screws **(B)** into the system backplane. The screw locations are shown in Figure 147 on page 128.
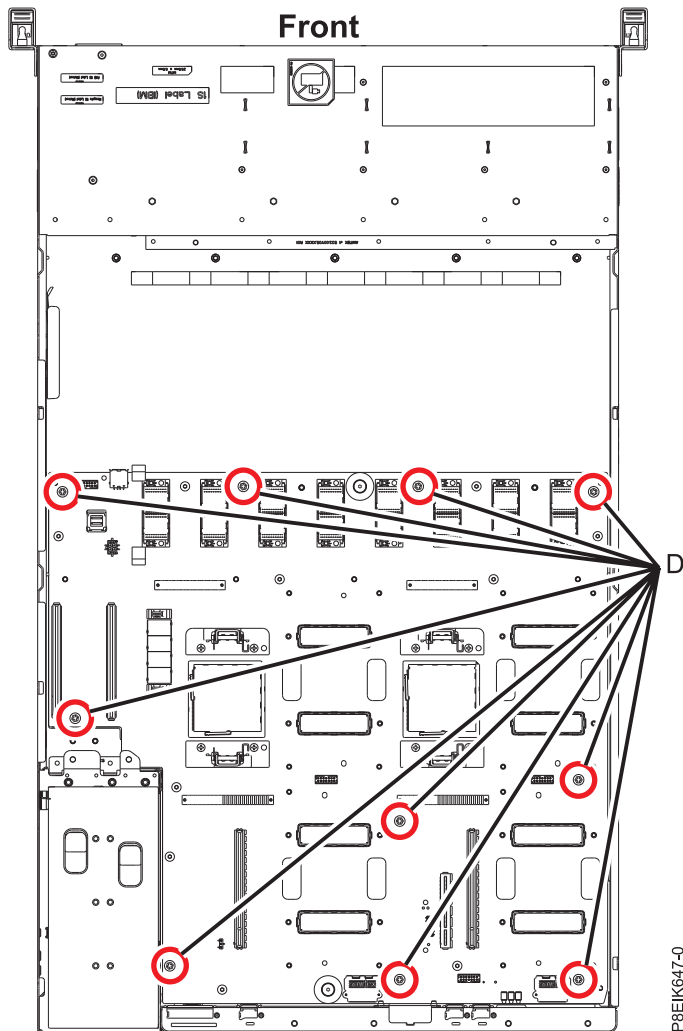
Figure 147. System backplane screw locations

The replacement system backplane is set-up for air cooling.

- The heat-sink hold-down brackets on the replacement system backplane are not long enough to properly secure the water-cooled processor cold plates. You will need to move the brackets from the old system backplane to the new system backplane.
- A jumper is set for the system backplane being air-cooled. You will need to change it to be water-cooled.

5. From the new system backplane, remove the four air-cooled heat-sink hold-down brackets. Each bracket has two screws. See Figure 148 on page 129. Set the brackets and the screws aside.
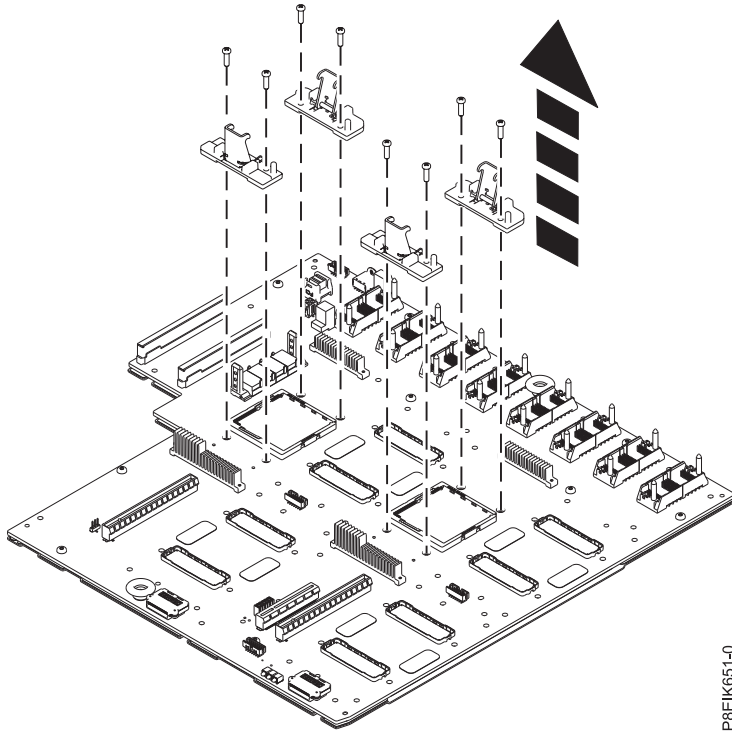
Figure 148. Removing the heat-sink hold-down clips

6. From the old system backplane, remove the four water-cooled cold-plate hold-down brackets. Each bracket has two screws. Keep this separate from the air-cooled brackets. The water-cooled brackets are slightly taller than the air-cooled brackets.
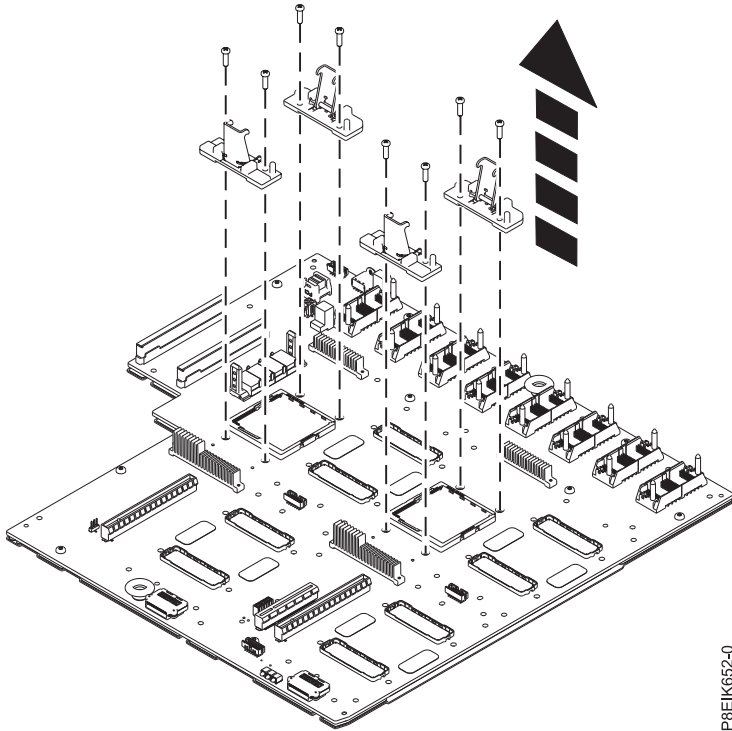
Figure 149. Removing the cold-plate hold-down clips

7. Install the water-cooled cold-plate hold-down brackets onto the new system backplane.
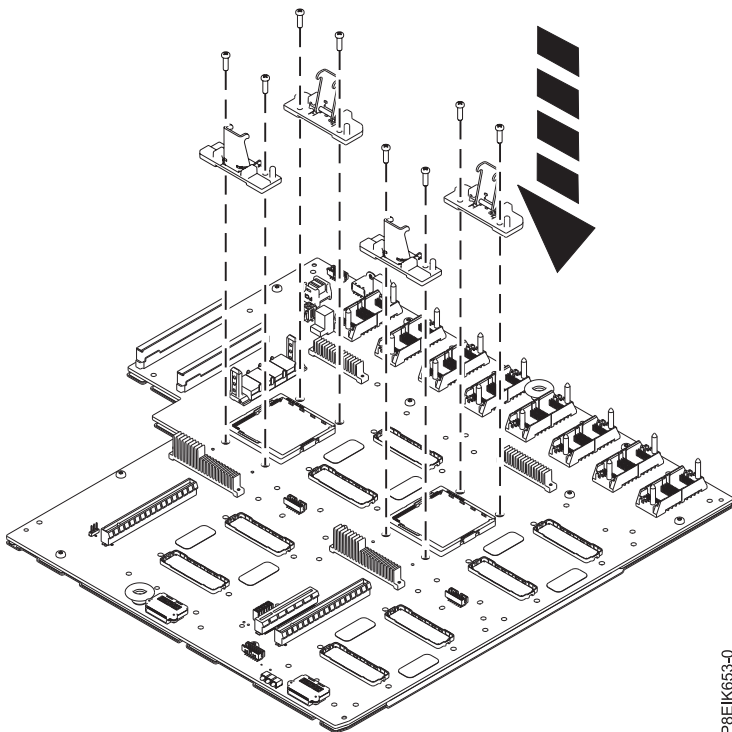
Figure 150. Installing the cold-plate hold-down clips

8. Ensure the jumper shown in Figure 151 is set to the water cooled position.
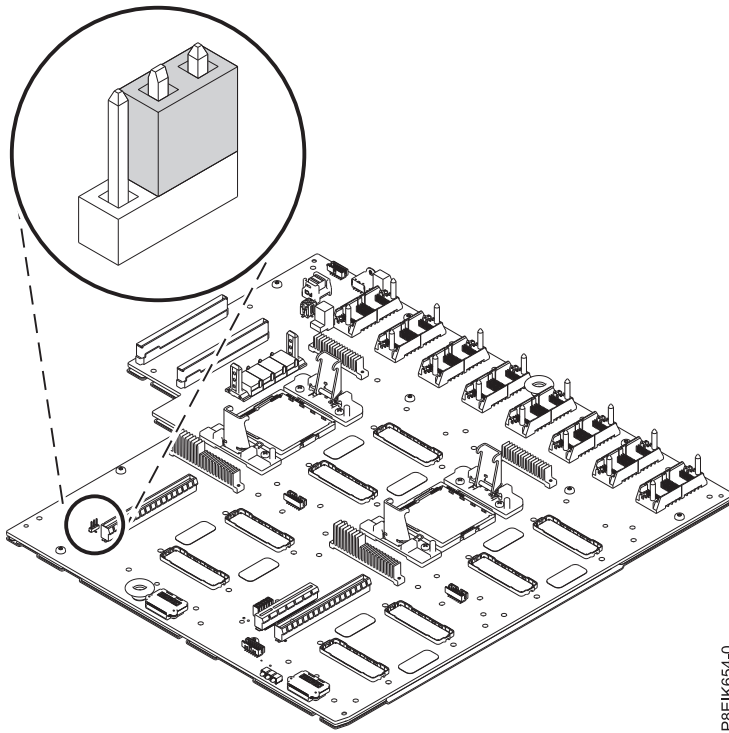
Figure 151. Jumper in water-cooled position

9. Replace the middle support **(C)**. See Figure 152 on page 132.
   a. Lower the middle support **(C)** into place.
   b. Replace the screw **(E)** on the side of the system; one on each side.
   c. Replace the four screws **(D)** that connect the middle support to the system backplane.
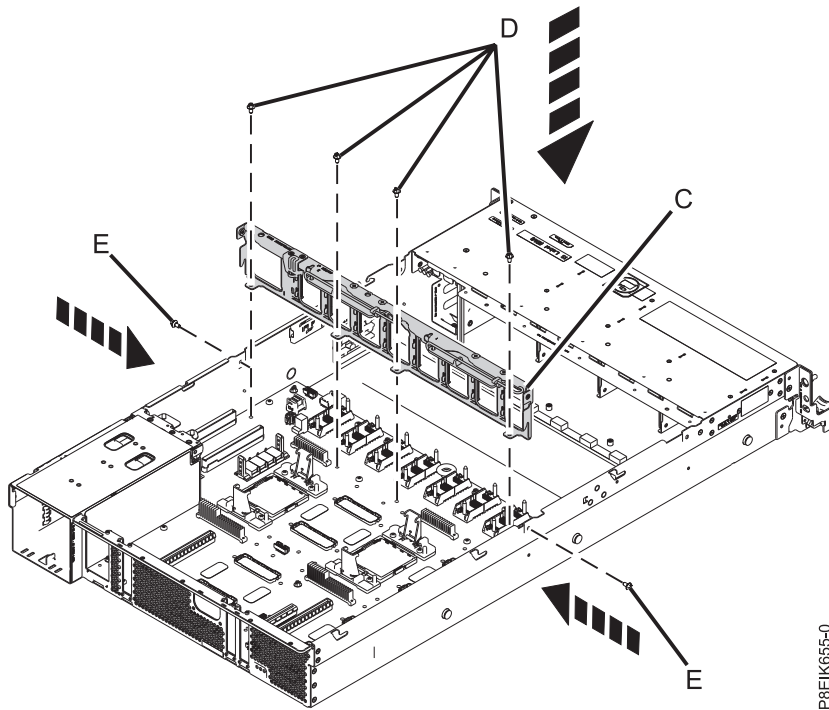
Figure 152. Replacing the middle support

10. Using your labels, replace the GPUs. For instructions, see "Replacing the graphics processing unit in a water-cooled 8335-GTB system" on page 67.

11. On the new system backplane, remove the socket cover from a system processor socket.

12. Using your labels, replace the system processor modules. For instructions, see "Replacing a system processor module in a water-cooled 8335-GTB system" on page 163.

13. Replace the cold plates. For instructions, see "Replacing the cold plates in the 8335-GTB system" on page 24.

14. Replace the power distribution cards. For instructions, see "Replacing a power riser in the 8335-GTB" on page 84.

15. Using your labels, replace the fan power cable into that connector in the power distribution card. For instructions, see "Replacing the 8335-GTB fan power cable" on page 51.

16. Using your labels, replace the front USB cable into that connector in the system backplane. For instructions, see "Replacing the front USB cable and connector in the 8335-GTB" on page 57.

17. Using your labels, replace the power switch and cable into that connector in the system backplane. For instructions, see "Replacing the power switch and cable in the 8335-GTB system" on page 90.

18. Using your labels, replace the disk and fan signal cable into that connector in the system backplane. For instructions, see "Replacing the disk and fan signal cable in the 8335-GTB system" on page 45.

19. Using your labels, replace the memory cards For instructions, see "Replacing memory risers in the 8335-GTB" on page 77.

20. Using your labels, replace the PCIe adapter cards. For instructions, see "Replacing a PCIe adapter in the system backplane in the 8335-GTB" on page 80.

21. Replace the BMC card. For instructions, see "Replacing the BMC card in the 8335-GTB" on page 94.

22. Install the power riser air baffle. Ensure that the holes in the baffle align with the pins on the system. Using the blue tabs **(C)**, insert the edge **(A)** of the baffle into the side of the system **(B)**. Then snap the baffle down into place. See Figure 153 on page 133.
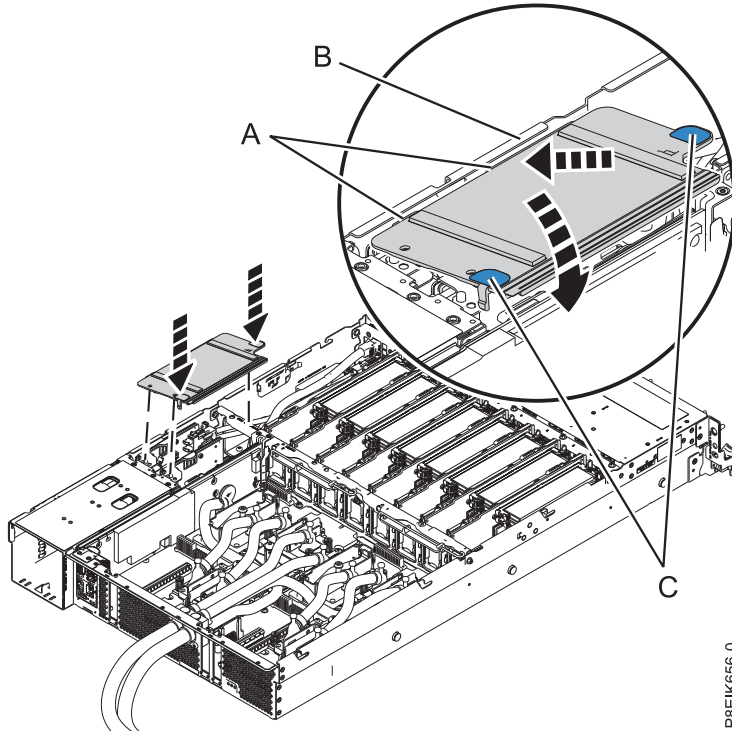
Figure 153. Installing the power riser air baffle

Preparing the system for operation after removing and replacing the system backplane in a water-cooled 8335-GTB

To prepare a water-cooled system for operation after replacing a system backplane, complete the steps in this procedure.

About this task

Procedure

1. Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

2. Verify that the jumper is set to water-cooled by using the `ipmitool` command:

```
ipmitool -I lanplus -U <username> -P <password> -H <bmc ip or hostname> sensor list | grep "Water Cooled"
```

   The value for the water-cooled jumper setting is `0x0180`:

```
Water Cooled | 0x0 | discrete | 0x0180| na | na | na | na | na | na
```

   If the value returned is **not** `0x0180`, you must correct the jumper setting as shown in "Replacing the system backplane in a water-cooled 8335-GTB" on page 126.

3. Set the system serial number in the system backplane.

   After you replace the system backplane, you must set the system serial number in the system backplane by using the vital product data (VPD) update tool. To download the tool, complete the following steps:

   a. Go to the IBM Support Portal website(www.ibm.com/support/entry/portal/product/power/scale-out_lc).

   b. In the search field, enter your machine type and model. Then, click the correct product support entry for your system.

c. From the Downloads list, click Scale-out LC system VPD update tool.

d. Follow the directions that are provided with the tool to update the VPD.

4. Restore the BMC network settings by completing the following steps:

   a. Access the BMC GUI from a browser. The user needs Administrator privilege. You can use either Google Chrome or Mozilla Firefox browsers.

   b. Navigate to **HMC Management** > **Console Settings** > **Change BMC/IPMI Network Settings**

   c. Set the following values:

   ```
   IP address
   Subnet mask
   Gateway
   ```

5. Update the BMC firmware.

   After you replace a system backplane, you must update the BMC firmware. To download the update, go to the Fix Central website (www.ibm.com/support/fixcentral/). Follow the instructions provided with the update.

Removing and replacing a system processor module for the 8335-GTB

Learn how to remove and replace a system processor module in the IBM Power System S822LC (8335-GTB) system.

Removing a system processor module from an air-cooled 8335-GTB system

Learn how to remove a system processor module from the air-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

About this task

As part of the system processor module replacement, the heat sink is removed. The system can use two types of thermal interface materials (TIMs); silver with trimmed corners, or gray with square corners.

- When the heat sink is removed from the system processor module, the silver-colored thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the silver-colored TIM is damaged, do not reuse the removed heat sink. Before you begin the removal and replacement procedure, ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.

- If a gray-colored TIM is used and needs replacing, ensure that you have a spare TIM, part number 01AF742, on hand. Alternatively, have a spare TIM and heat sink, part number 01AF286, on hand.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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 packaging of the new system processor module, and place the cover upside down next to the tray, as shown in Figure 154. The cover is used for the system processor module that you are replacing.
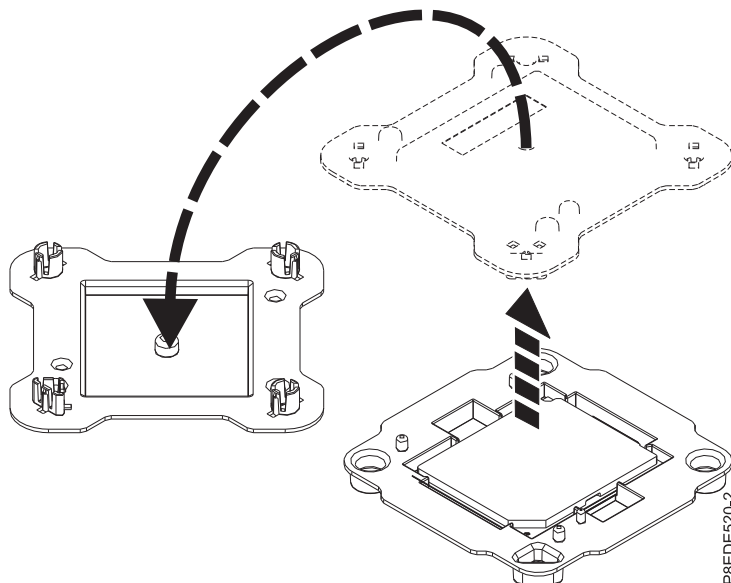
Figure 154. Opening the system processor module packaging

3. Remove the heat sink from the system processor module:

   a. Loosen the heat sink actuation screw by turning the supplied hex key counterclockwise **(A)**. Loosen the screw until it moves freely. See Figure 155 on page 136.

   b. Grip the heat sink **(B)** on opposing sides and remove the heat sink by lifting it upward. Set the heat sink aside with the module side facing upward.

   Note: If you plan to remove dust or debris from the heat sink, this operation must be done in another room that is greater than 7.6 m (24.9 ft) away from the work area.
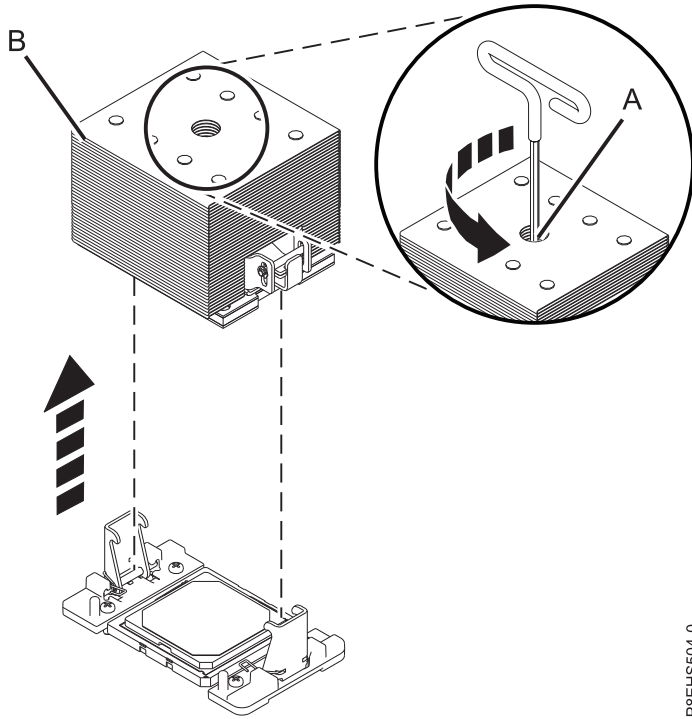
Figure 155. Removing the heat sink

4. If the system uses the gray-colored thermal interface material (TIM): Using the tweezers, remove the gray-colored TIM from the top of the processor and place it in a clean, dry area as shown in Figure 156 on page 137. The system can use two types of TIMs. One TIM is silver-colored with trimmed corners and typically adheres to the heat sink. The other is TIM is dark gray with square corners and does not adhere. The gray-colored TIM needs to be removed before the processor is removed.
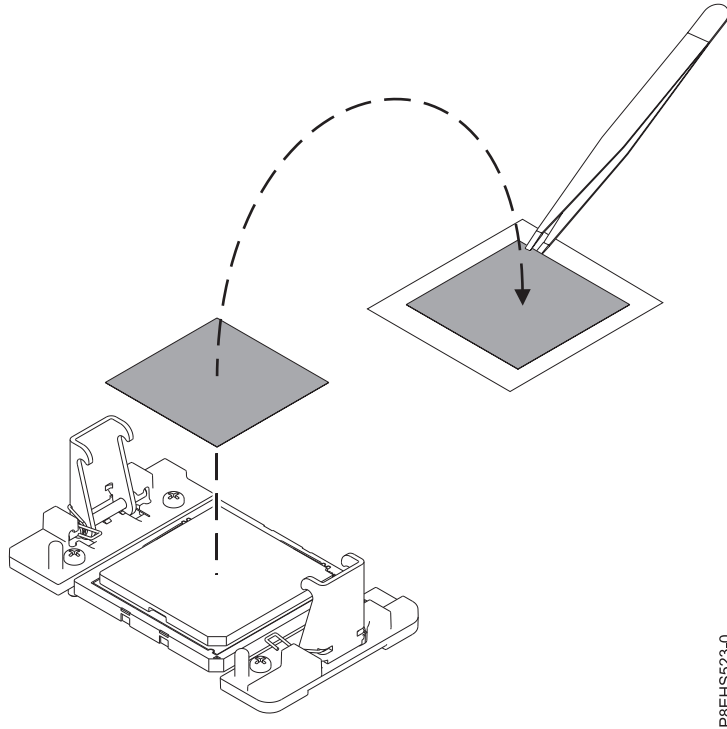
Figure 156. Removing the gray-colored TIM from the processor

5. Remove dust and debris from the system processor module area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor module area. Blow small bursts of air from the center toward the sides of the system processor module as shown in Figure 157 on page 138. If your air pump is not assembled as shown in Figure 157 on page 138, fasten the tip onto the bulb.
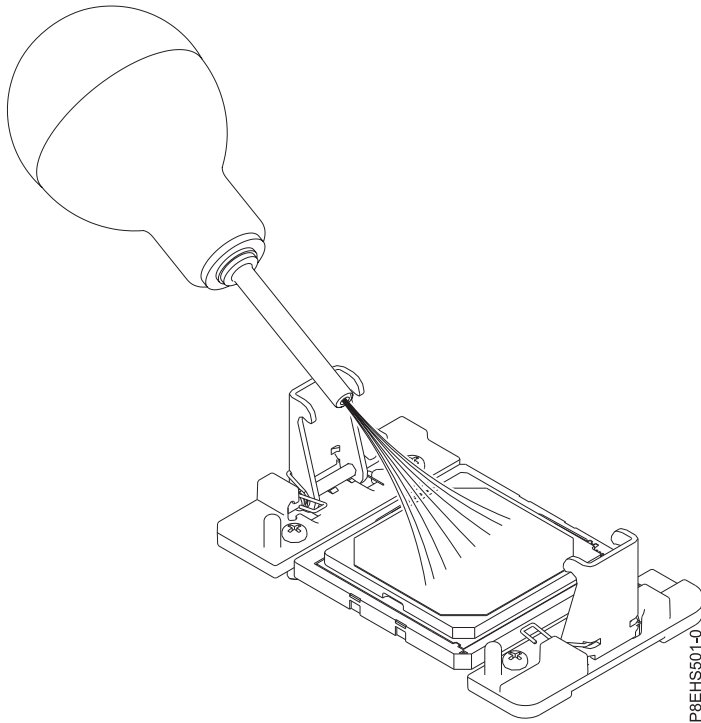
Figure 157. Removing dust and debris from the system processor module area

6. Prepare the system processor module for removal.

   a. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the system processor module as shown in Figure 158 on page 139.

   b. Lower the tool over the system processor module by ensuring the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool.
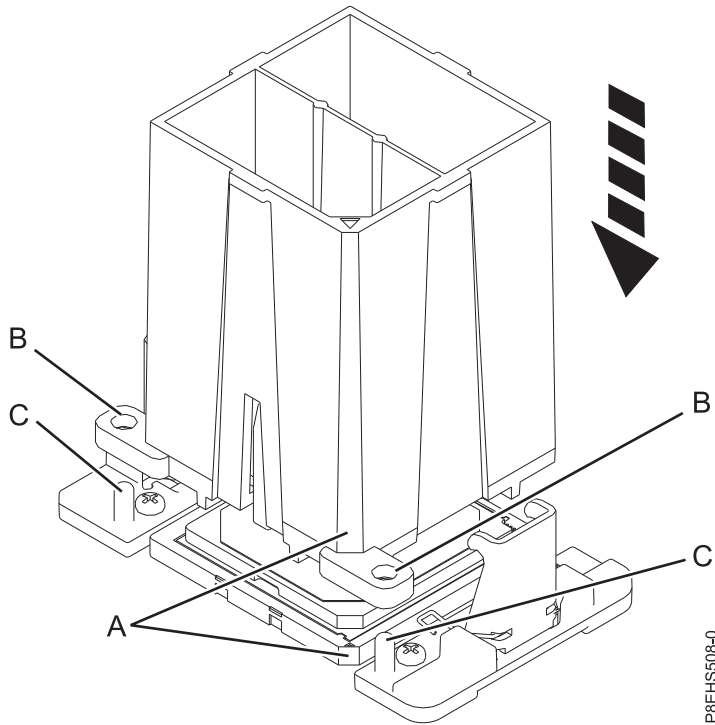
Figure 158. Lowering the removal tool onto the system processor module

c. With the removal tool **(A)** sitting on top of the system processor module, push down on the tool to lock the system processor module into the tool as shown in Figure 159 on page 140. Make sure that both of the tool jaws are locked on the system processor module. Do not press the blue release tabs until directed to do so later.

Note: The tool drops slightly when you push down on the processor module so that the jaws can grab the bottom of the module.
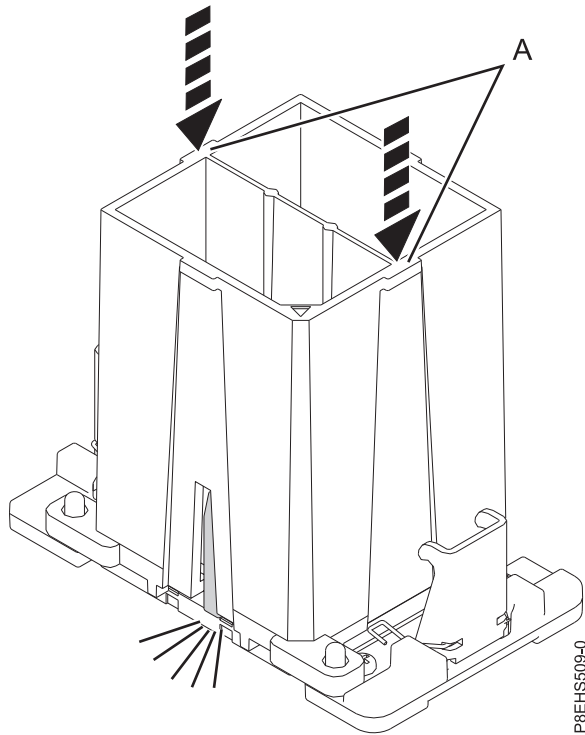
Figure 159. Locking the system processor module into the tool

7. Holding the outside of the tool, lift the tool and system processor module from the socket. Place them at an angle in the top cover of the system processor module packaging, as shown in Figure 160 on page 141.

   Note: Setting the tool and system processor module at an angle on the top cover of the system processor module packaging will make it easier to pick up and place in the packaging after you replace the system processor module.
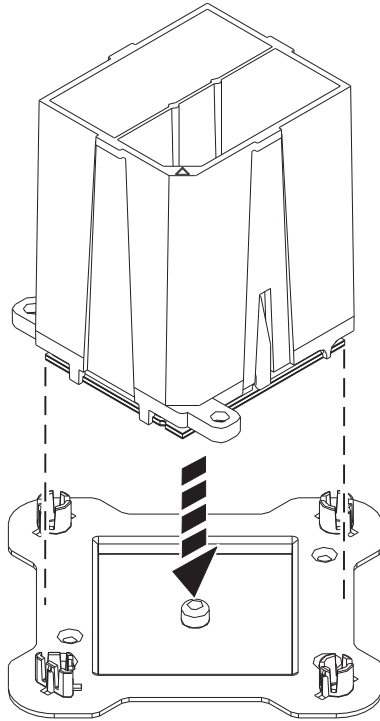
Figure 160. Placing the tool at an angle on the top cover of the packaging

8. Squeeze the two blue tabs to release the system processor module from the tool. See Figure 161 on page 142.

   Note: To prevent the system processor module from falling, do not squeeze the two tabs before you place the tool on the top cover of the system processor module packaging.
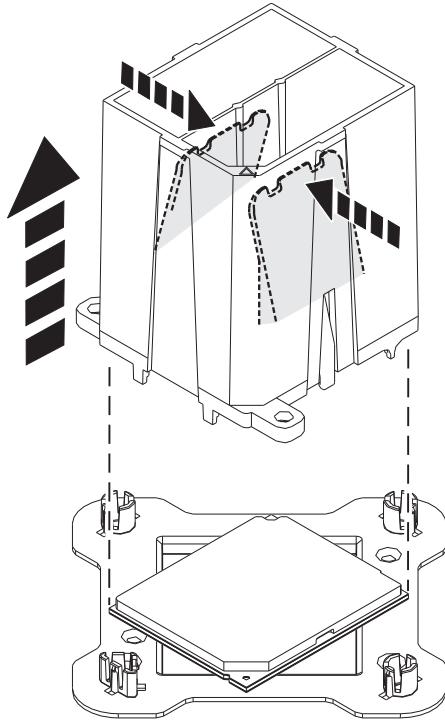
Figure 161. Releasing the system processor module from the tool

Replacing a system processor module in an air-cooled 8335-GTB system

Learn how to replace a system processor module in the air-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove dust and debris from the system processor socket area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor socket area.
3. Prepare the system processor module for installation:
   a. Remove the replacement processor module from the shipping tray. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the module as shown in Figure 162 on page 143.
   b. Lower the tool over the system processor module by ensuring that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool as shown in Figure 162 on page 143. Then, push down on the tool to lock the system processor module into the tool as shown in Figure 163 on page 143. Do not press the blue release tabs until directed to do so later.
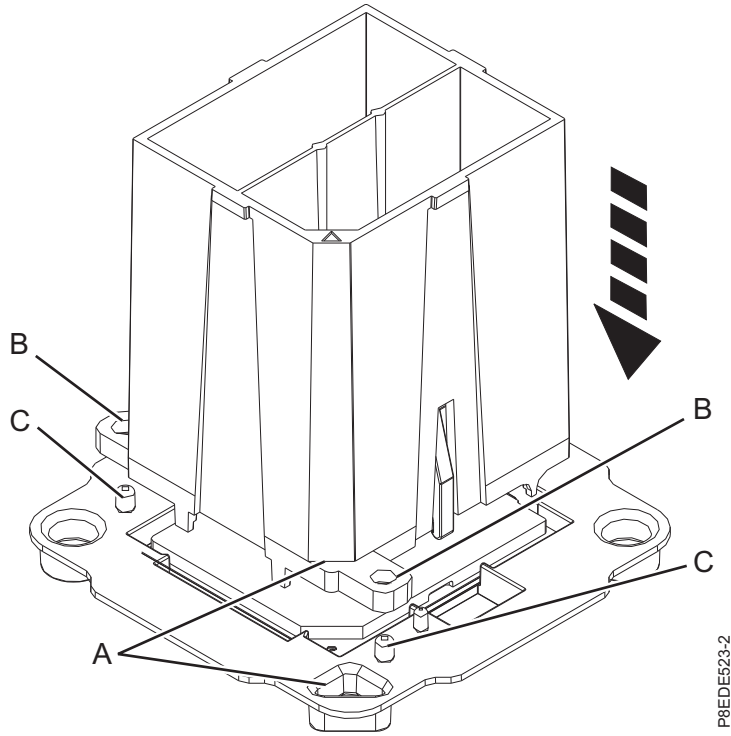
Figure 162. Aligning the removal tool
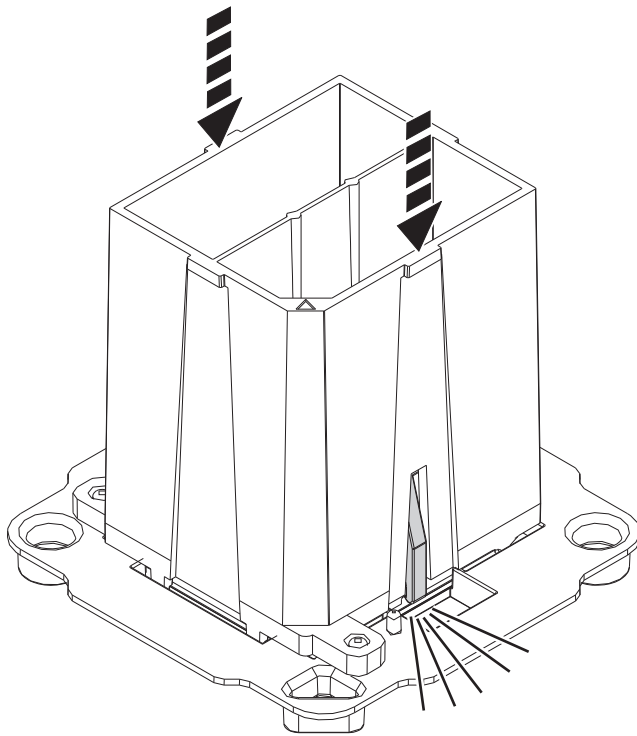
Figure 163. Locking the system processor module into the tool

4. Prepare for system processor module installation:

a. Grasping the sides of the tool and system processor module, carefully lift it slightly out of the system processor module tray. Then, turn it over so that the system processor module side is up.

b. Ensure that both jaws **(A)** are firmly grabbing the system processor module, as shown in Figure 164.

   Note: If both jaws are not firmly grabbing the system processor module, press down on the corner of the system processor module closest to the jaw until it locks into place. Do not touch any part of the system processor module other than the corners.
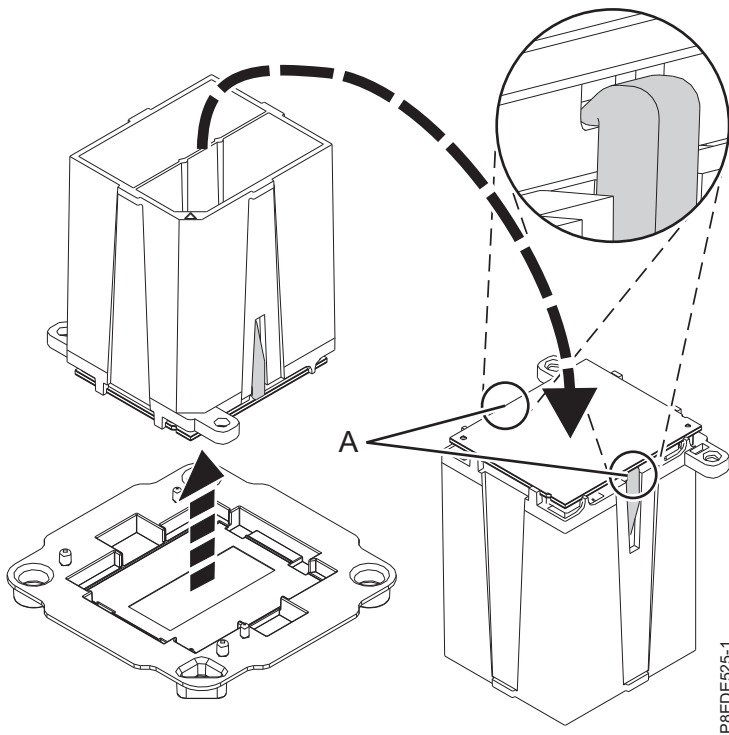
Figure 164. Preparing for system processor module installation

5. Install the system processor module:

   a. If dust or debris is present on the system processor socket, use the supplied air pump (part number 45D2645) to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown Figure 165 on page 145.
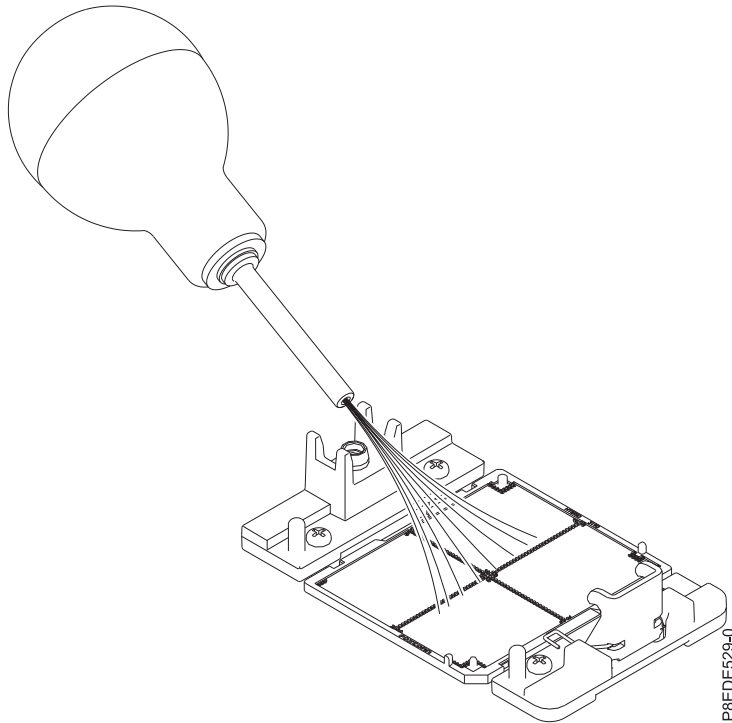
Figure 165. Removing dust and debris from the system processor socket

    b. Lower the tool and system processor module onto the socket. Align the beveled corner **(A)** of the tool with the beveled corner on the socket. Ensure that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool. See Figure 166 on page 146.

       Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.
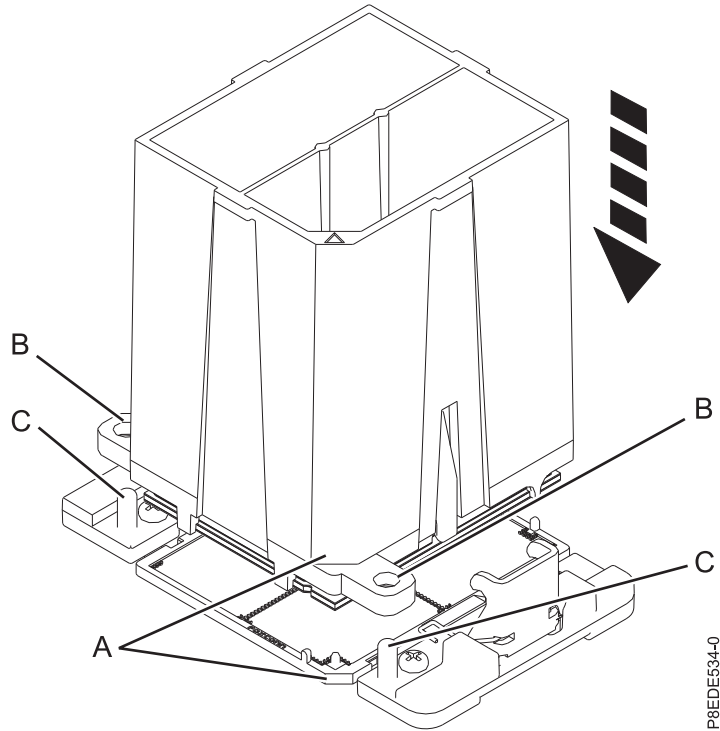
Figure 166. Installing the system processor module

    c. After the tool and system processor module holes and guide pins are properly aligned, squeeze and hold the two blue release tabs **(A)** together until a firm stop is reached, as shown in Figure 167 on page 147. Then, lift the tool off the system processor module.
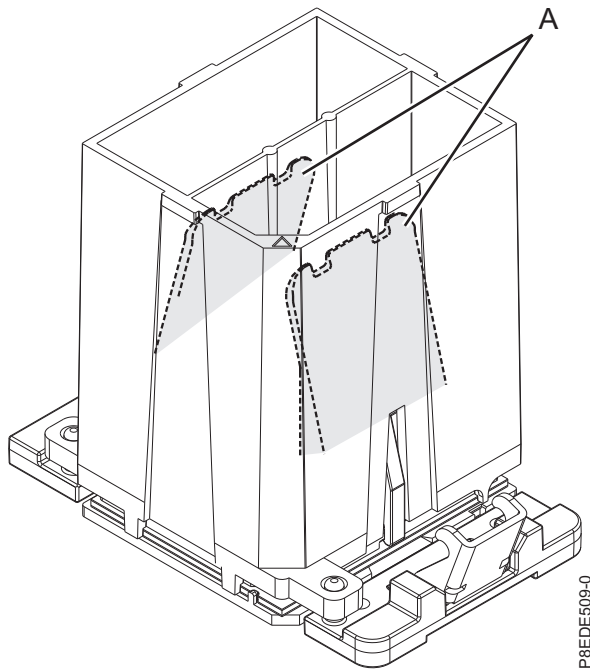
Figure 167. Removing the system processor module tool

6. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in Figure 168 on page 148 or Figure 169 on page 148. If you see folds, tears, bends, or if you have doubts about the TIM, replace it.

   The system can use two types of thermal interface materials (TIMs).

   • One TIM is silver-colored with trimmed corners and a red line, part number 44V8038.

   The silver-colored TIM is typically adhered to the heat sink. Unless damaged, the silver-colored TIM that is adhered to the heat sink can be reused. If the silver-colored TIM is damaged, use the supplied scraper to remove the TIM. If you cannot remove the damaged TIM from the heat sink, you will need to replace both the silver TIM and heat sink. Ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.

   • The other is TIM is dark gray with square corners, part number 01AF742.

   The dark gray TIM can be reused unless it is damaged. You will need to move it to the new system processor module.

Figure 168. Inspecting the silver-colored thermal interface material
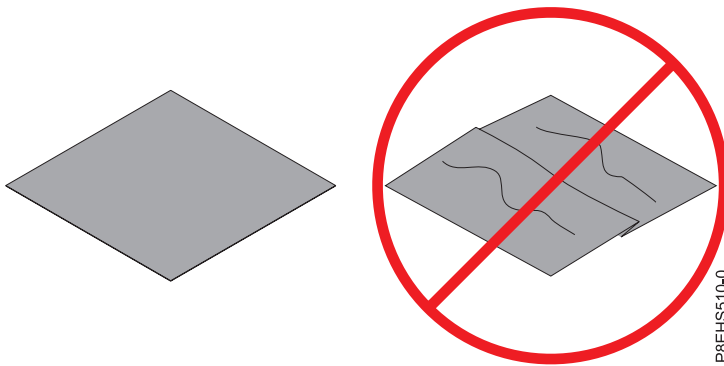
Figure 169. Inspecting the gray-colored thermal interface material

7. Choose one of the following repair options:

Option	Description
Is the silver-colored TIM damaged?	It is damaged. Proceed to step 8 on page 149 to replace both the silver-colored TIM and heat sink.
Is the silver-colored TIM not damaged?	It is not damaged and can be reused. Proceed to step 9 on page 150 to install the existing silver-colored TIM and heat sink.
Is the gray-colored TIM damaged?	It is damaged. Proceed to step 10 on page 151 to replace the gray-colored TIM and install the existing heat sink.
Is the gray-colored TIM not damaged?	It is not damaged and can be reused. Proceed to step 11 on page 153 to move the gray-colored TIM and install the existing heat sink.

8. Use this step to install a new silver-colored TIM and heat sink.

    a. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

    b. Remove the protective film from the clear carrier strip by using the supplied tweezers.

       Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

    c. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The silver-colored TIM must have the red stripe up. Align the beveled edges of the silver-colored TIM and the system processor module **(A)**, as shown in Figure 170.

Figure 170. Installing the silver-colored TIM onto the processor. The red stripe must be up.

    d. Place the new heat sink on the TIM as shown in Figure 171 on page 150.
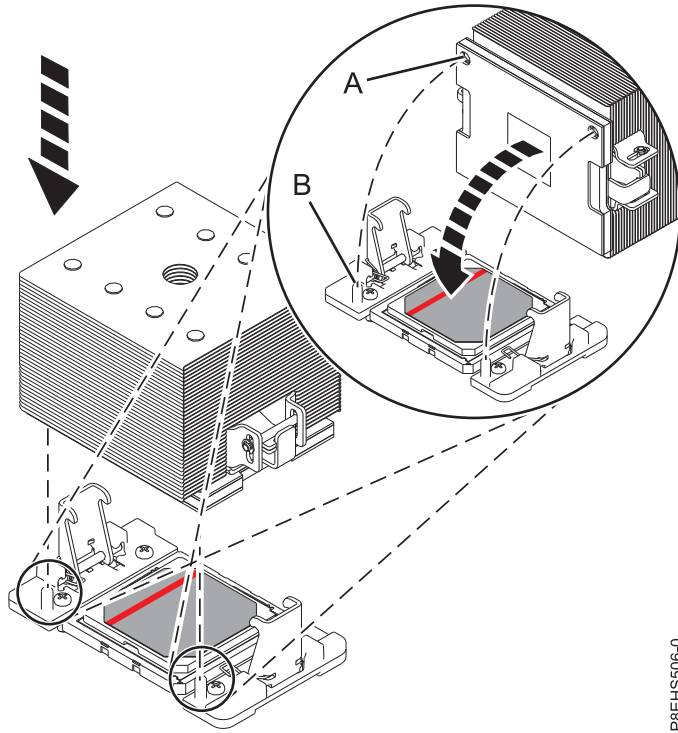
Figure 171. Installing the new heat sink on the silver-colored TIM

Continue with step 12 on page 154.

9. Use this step to reuse the existing undamaged silver-colored TIM and heat sink. The undamaged silver TIM is adhered to the heat sink. Both need to be placed on the processor as shown in Figure 172 on page 151.
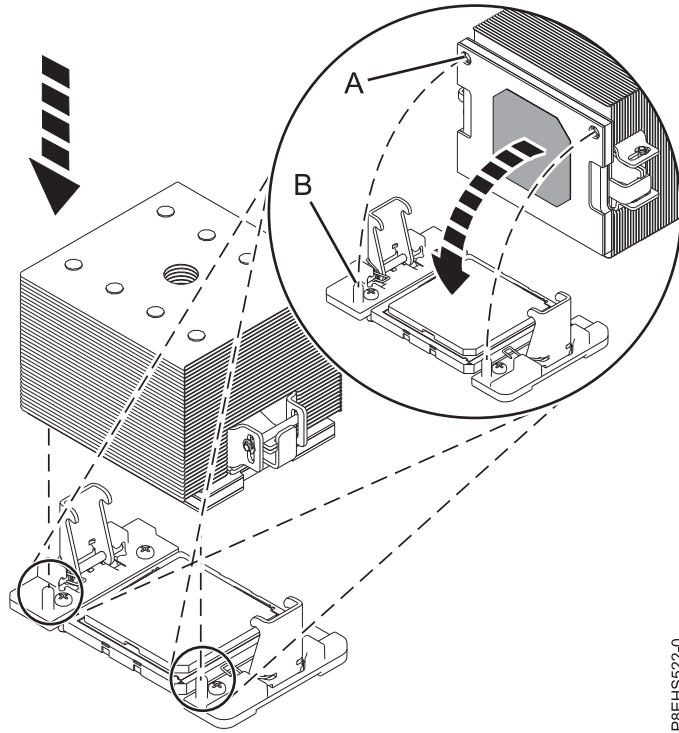
Figure 172. Reusing the undamaged silver-colored TIM and heat sink

Continue with step 12 on page 154.

10. Use this step to install a new gray-colored TIM and reuse the existing heat sink.

   a. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

   b. Remove the protective film from the clear carrier strip by using the supplied tweezers.

   Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

   c. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The gray-colored TIM has no preferred up side. The gray-colored TIM can be placed on the processor and centered as shown in Figure 173 on page 152.
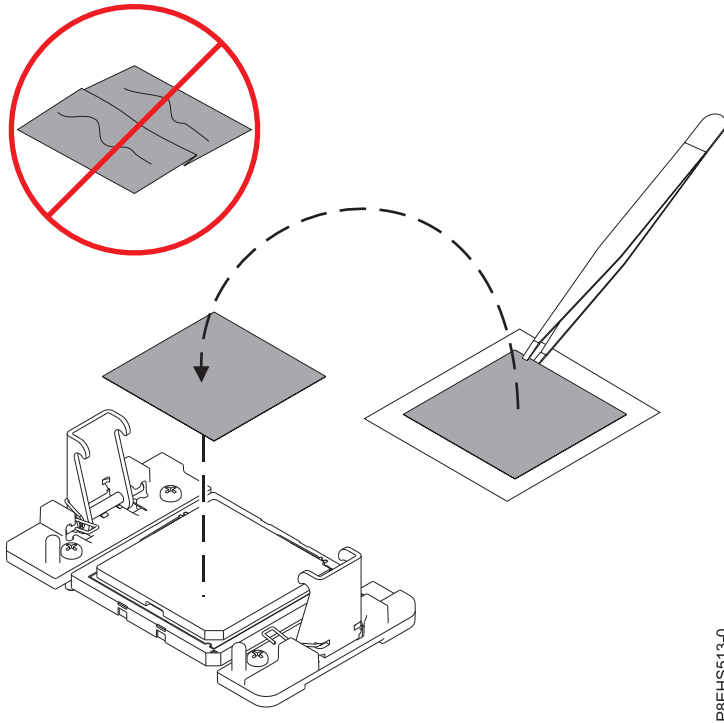
Figure 173. Installing a new gray-colored TIM onto the processor. The gray colored TIM has no preferred up side.

    d. Place the heat sink on the TIM as shown in Figure 174.
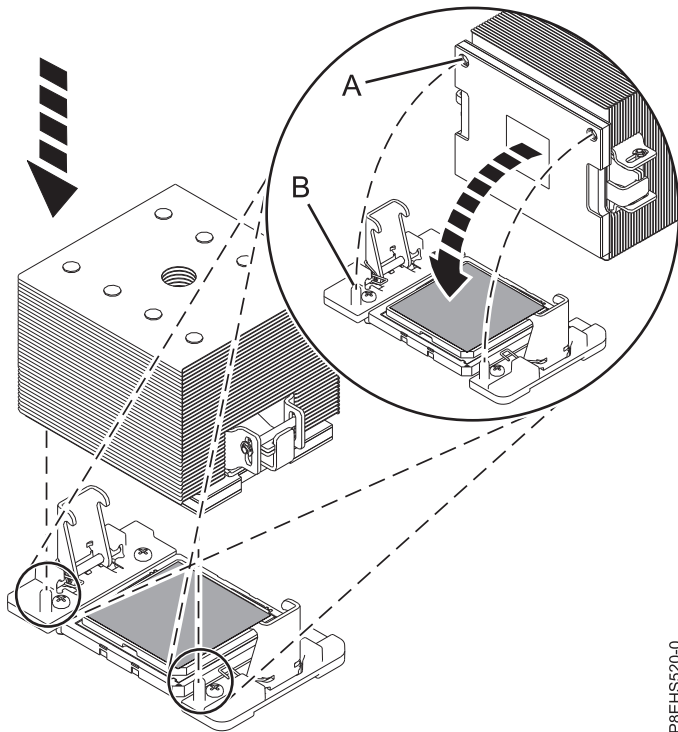
Figure 174. Installing the heat sink on the gray-colored TIM

Continue with step 12 on page 154.

11. Use this step to reuse the existing undamaged gray-colored TIM and heat sink.

   a. Using the tweezers, move the old processor's TIM from the clean, dry surface and center it onto the new system processor module. The gray-colored TIM has no preferred up side. The gray-colored TIM can be placed on the processor and centered as shown in Figure 175.
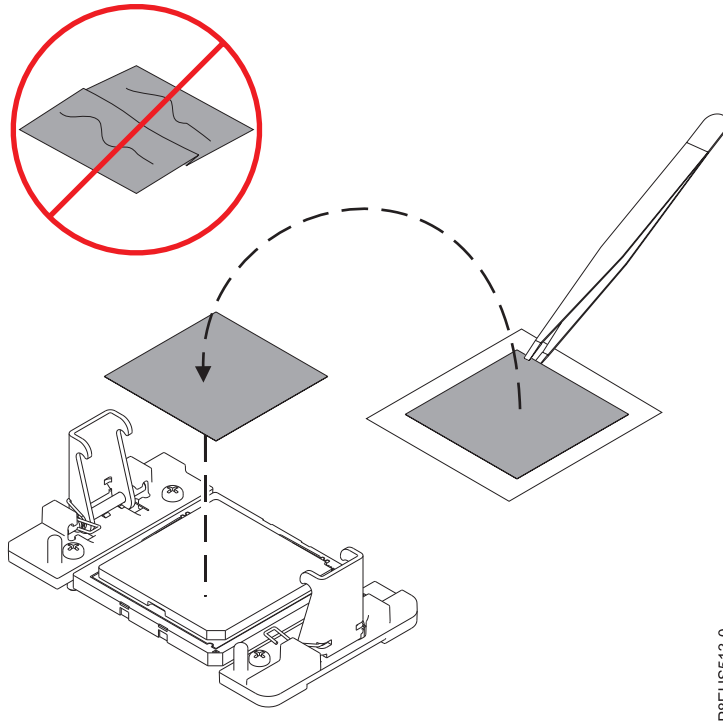
Figure 175. Moving the gray-colored TIM onto the processor. The gray colored TIM has no preferred up side.

   b. Place the heat sink on the TIM as shown in Figure 176 on page 154.
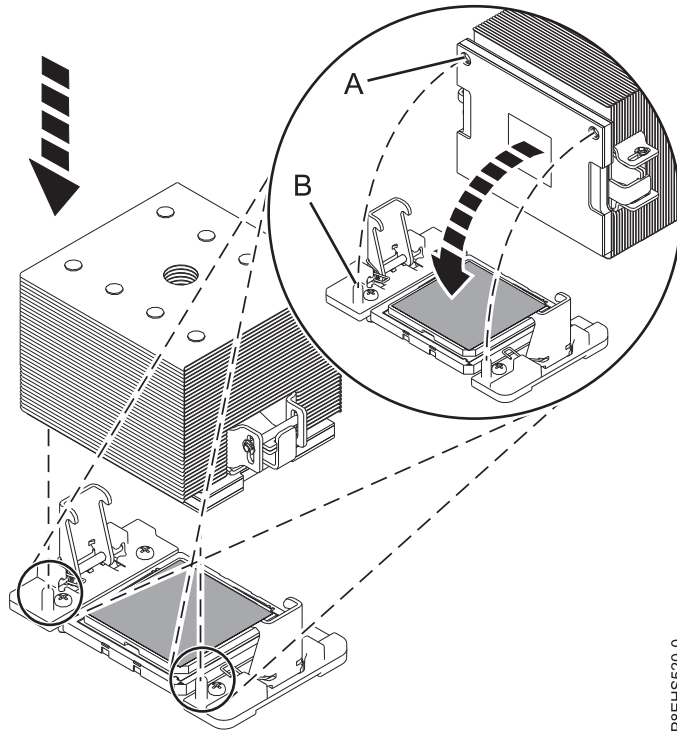
Figure 176. Installing the heat sink on the gray-colored TIM

Continue with step 12.

12. Secure the TIM and heat sink to the processor socket.

    a. Ensure that the heat sink load arms are engaged as shown by **(A)** in Figure 177.

    b. Tighten the center load screw clockwise by using the supplied hex key as shown by **(B)** in Figure 177 until a firm stop is reached. If the heat sink moves noticeably, the load arms are not engaged. Unscrew the center load screw and repeat this step again.
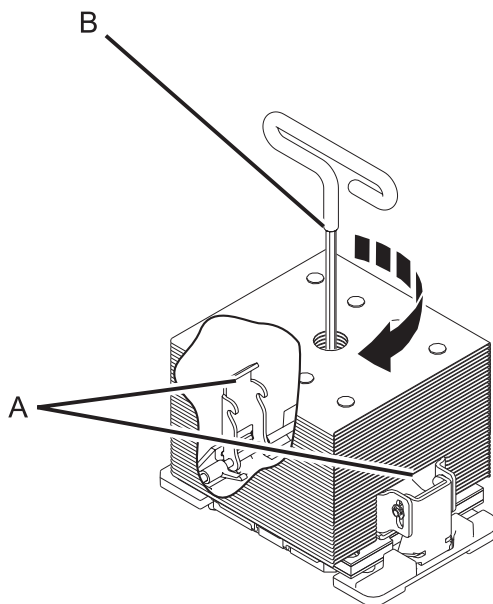
Figure 177. Tightening the center load screw on the heat sink

13. Lightly grip the system processor module that you replaced by the edges and lift it off of the packaging cover. Align the beveled corner of the module **(A)** to the corner of the packaging with triangle **(B)** and place it in the packaging, as shown in Figure 178. Close the packaging cover.
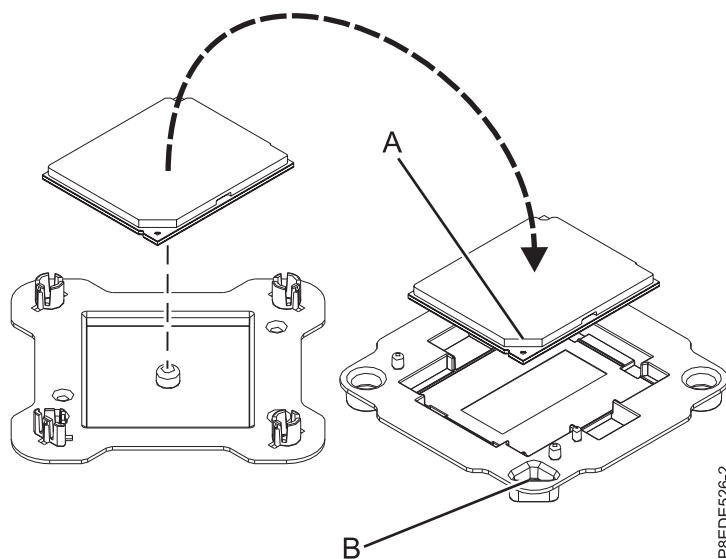
Figure 178. Placing the system processor module into the packaging

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing a system processor module from a water-cooled 8335-GTB system

Learn how to remove a system processor module from the water-cooled IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

About this task

As part of the system processor module replacement, the cold plate is removed. When the cold plate is removed from the system processor module, the thermal interface material (TIM) is typically adhered to the cold plate. Unless damaged, the TIM that is adhered to the cold plate can be reused. If the TIM is damaged, it will need to be replaced. Before you begin the processor removal and replacement procedure, ensure that you have a spare TIM, part number 01EM029, on hand.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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 packaging of the new system processor module, and place the cover upside down next to the tray, as shown in Figure 179. The cover is used for the system processor module that you are replacing.
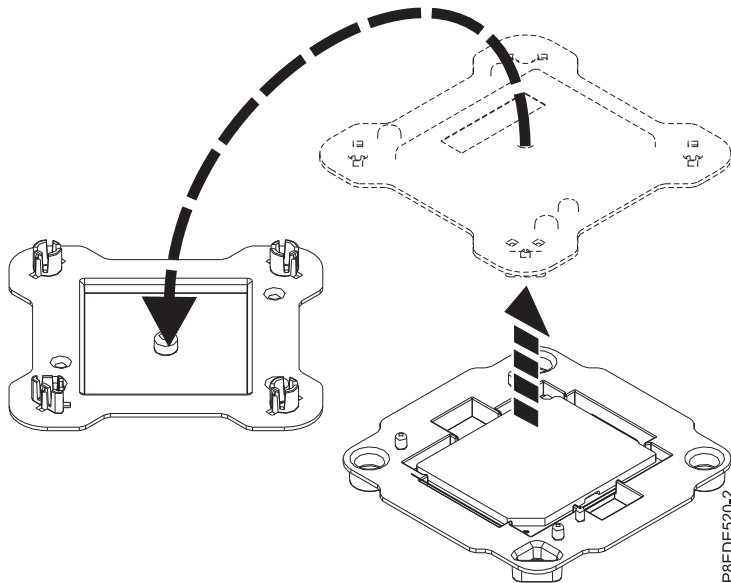
Figure 179. Opening the system processor module packaging

3. Remove the cold plate from the system processor module.

   a. Loosen the cold plate retainer screw by turning the supplied hex key counterclockwise as shown in Figure 180 on page 157. Loosen the screw until it moves freely.
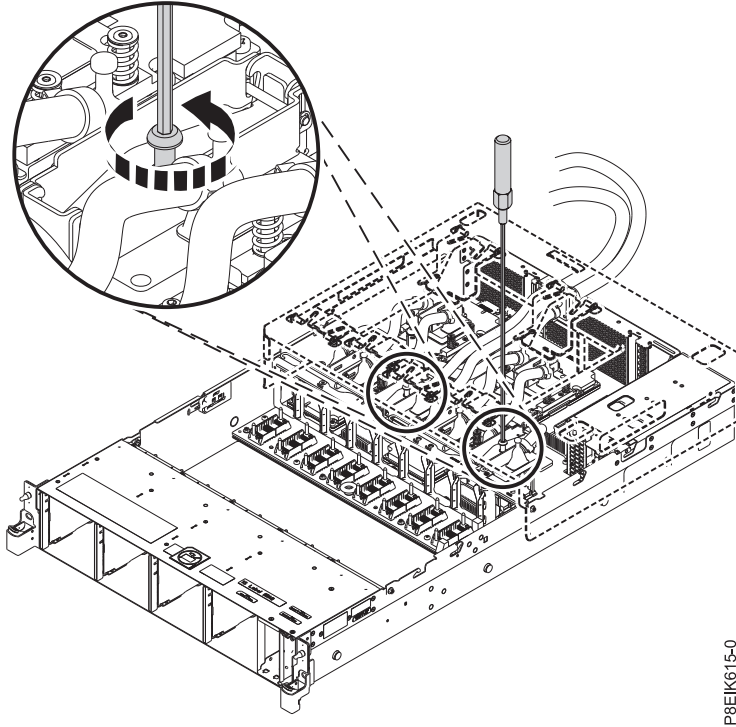
Figure 180. Loosening the cold plate retainer screw

   b. Lift the cold plate **(A)** off the system processor that you are removing and attach it to the service hook **(B)** as shown in Figure 181 on page 158.
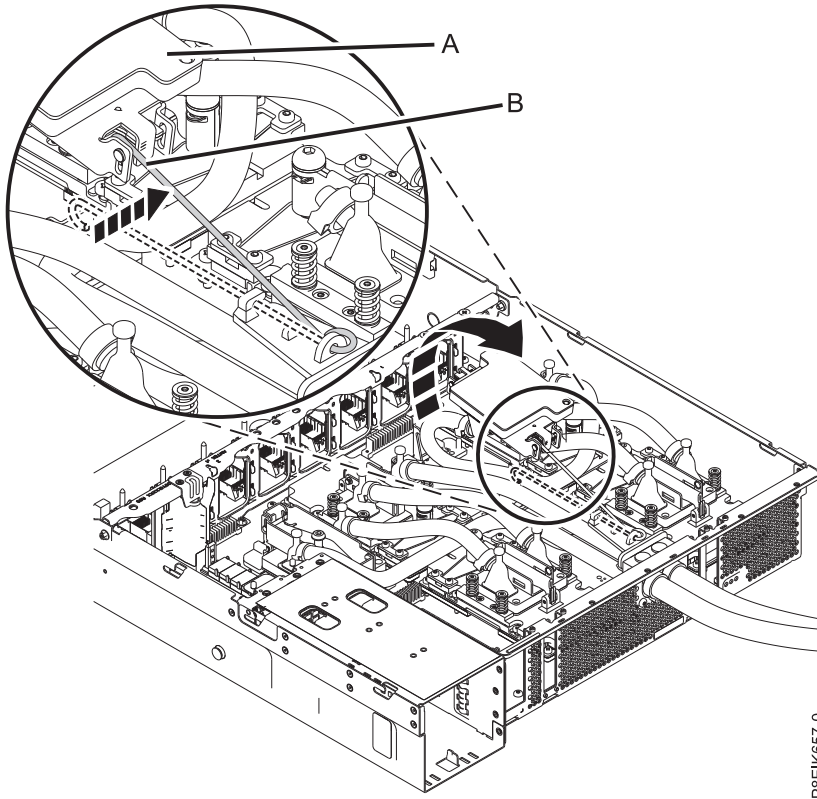
Figure 181. Removing the cold plate

4. Remove dust and debris from the system processor module area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor module area. Blow small bursts of air from the center toward the sides of the system processor module as shown in Figure 182 on page 159. If your air pump is not assembled as shown in Figure 182 on page 159, fasten the tip onto the bulb.
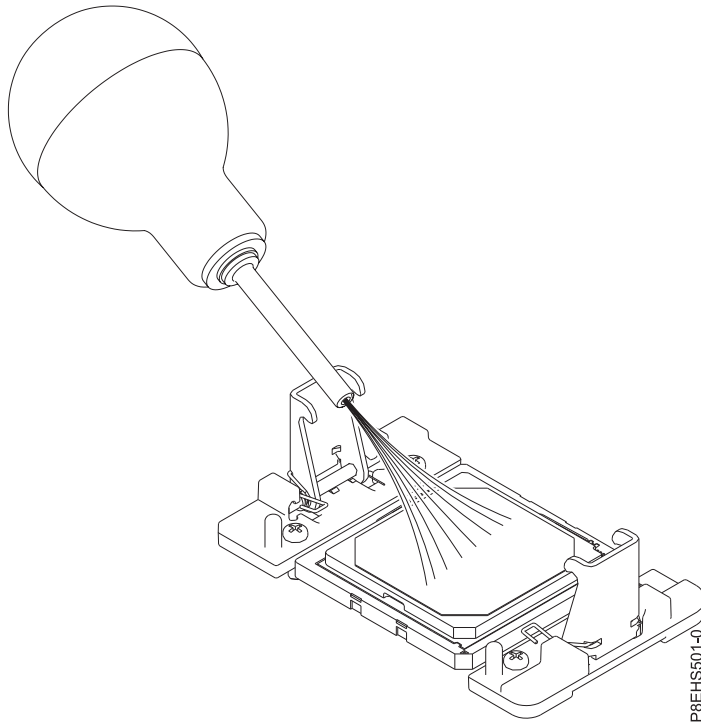
Figure 182. Removing dust and debris from the system processor module area

5. Prepare the system processor module for removal.

   a. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the system processor module as shown in Figure 183 on page 160.

   b. Lower the tool over the system processor module by ensuring the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool.
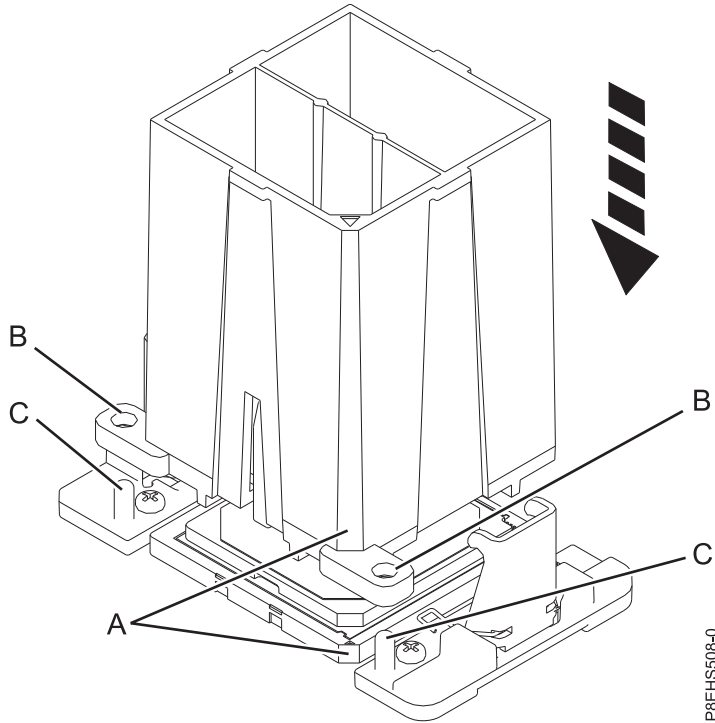
Figure 183. Lowering the removal tool onto the system processor module

   c. With the removal tool **(A)** sitting on top of the system processor module, push down on the tool to lock the system processor module into the tool as shown in Figure 184 on page 161. Make sure that both of the tool jaws are locked on the system processor module. Do not press the blue release tabs until directed to do so later.

   Note: The tool drops slightly when you push down on the processor module so that the jaws can grab the bottom of the module.
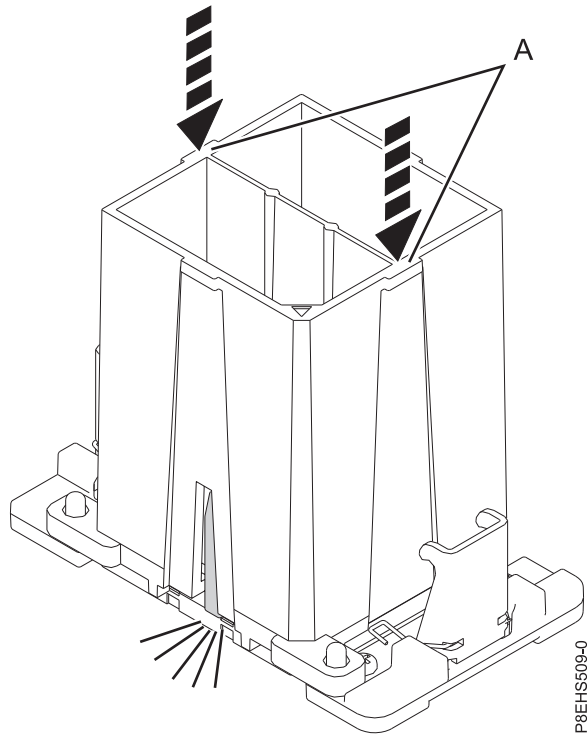
Figure 184. Locking the system processor module into the tool

6. Holding the outside of the tool, lift the tool and system processor module from the socket. Place them at an angle in the top cover of the system processor module packaging, as shown in Figure 185 on page 162.

Note: Setting the tool and system processor module at an angle on the top cover of the system processor module packaging will make it easier to pick up and place in the packaging after you replace the system processor module.
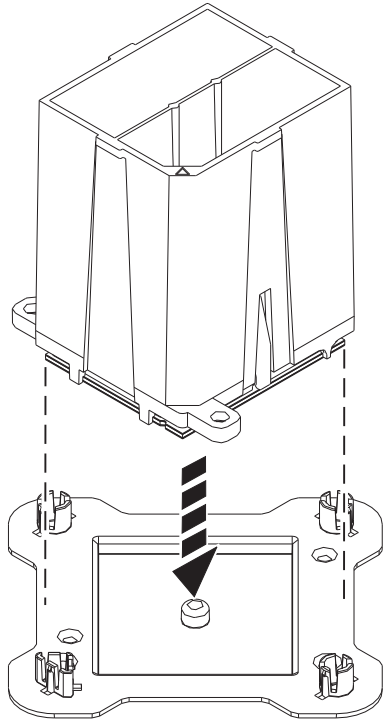
Figure 185. Placing the tool at an angle on the top cover of the packaging

7. Squeeze the two blue tabs to release the system processor module from the tool. See Figure 186 on page 163.

   Note: To prevent the system processor module from falling, do not squeeze the two tabs before you place the tool on the top cover of the system processor module packaging.
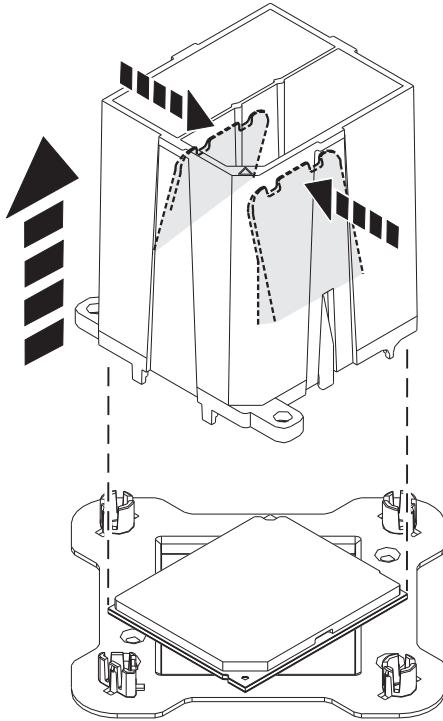
Figure 186. Releasing the system processor module from the tool

Replacing a system processor module in a water-cooled 8335-GTB system

Learn how to replace a system processor module in the water-cooled IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Remove dust and debris from the system processor socket area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor socket area.

3. Prepare the system processor module for installation:

   a. Remove the replacement processor module from the shipping tray. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the module as shown in Figure 187 on page 164.

   b. Lower the tool over the system processor module by ensuring that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool as shown in Figure 187 on page 164. Then, push down on the tool to lock the system processor module into the tool as shown in Figure 188 on page 164. Do not press the blue release tabs until directed to do so later.
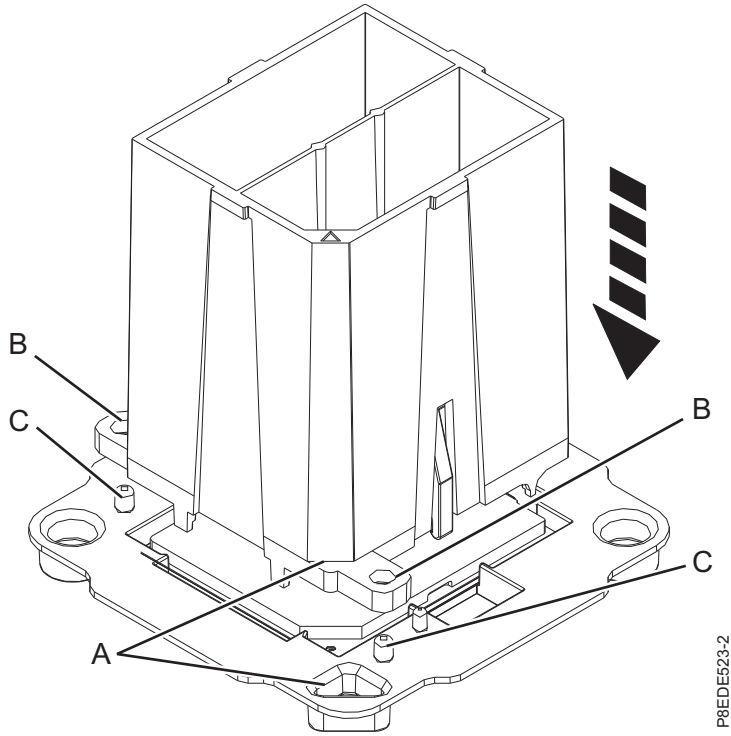
Figure 187. Aligning the removal tool
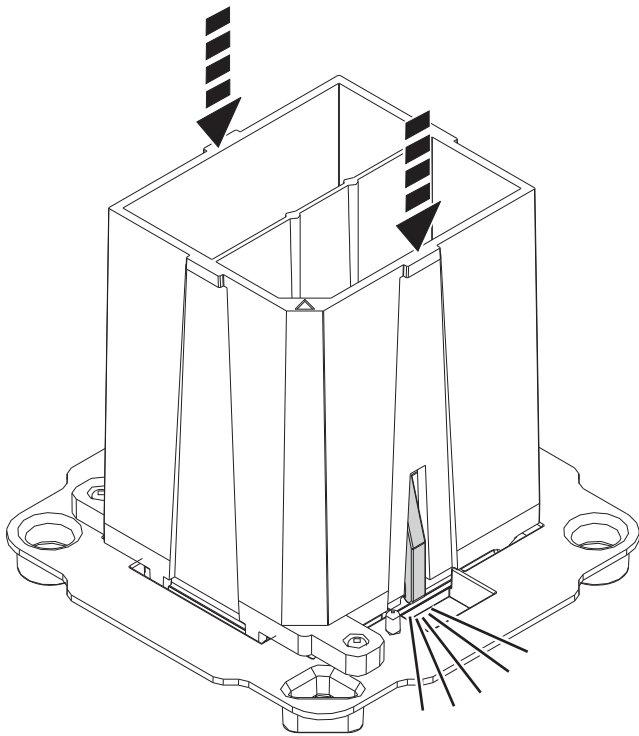
Figure 188. Locking the system processor module into the tool

4. Prepare for system processor module installation:

a. Grasping the sides of the tool and system processor module, carefully lift it slightly out of the system processor module tray. Then, turn it over so that the system processor module side is up.

b. Ensure that both jaws **(A)** are firmly grabbing the system processor module, as shown in Figure 189.

Note: If both jaws are not firmly grabbing the system processor module, press down on the corner of the system processor module closest to the jaw until it locks into place. Do not touch any part of the system processor module other than the corners.
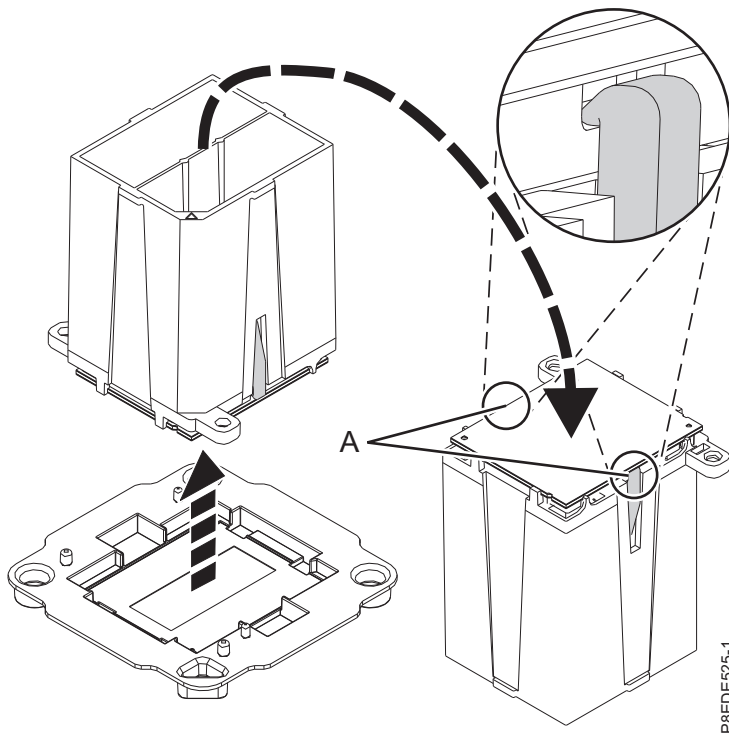
Figure 189. Preparing for system processor module installation

5. Install the system processor module:

a. If dust or debris is present on the system processor socket, use the supplied air pump (part number 45D2645) to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown Figure 190 on page 166.

P8EDE529-0

Figure 190. Removing dust and debris from the system processor socket

b. Lower the tool and system processor module onto the socket. Align the beveled corner **(A)** of the tool with the beveled corner on the socket. Ensure that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool. See Figure 191 on page 167.

Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.
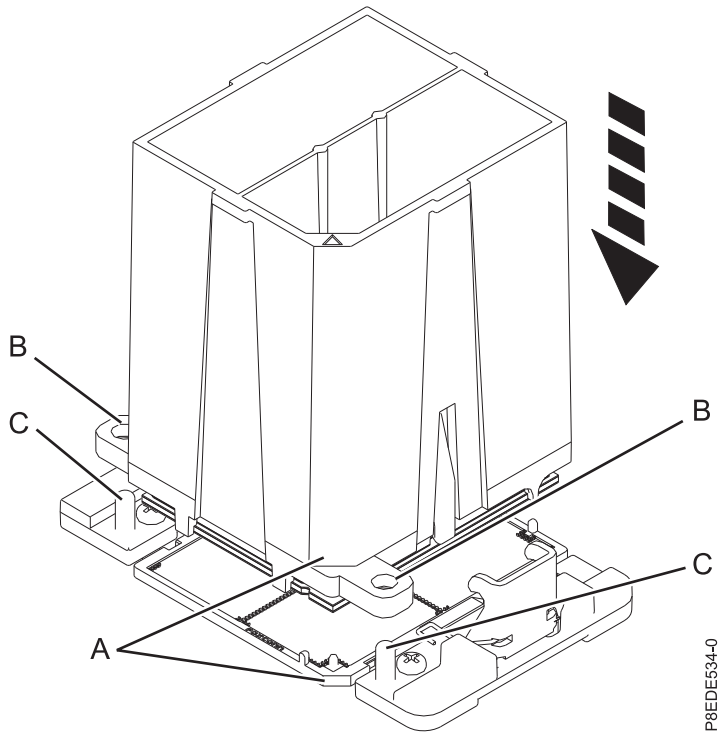
Figure 191. Installing the system processor module

   c. After the tool and system processor module holes and guide pins are properly aligned, squeeze and hold the two blue release tabs **(A)** together until a firm stop is reached, as shown in Figure 192 on page 168. Then, lift the tool off the system processor module.
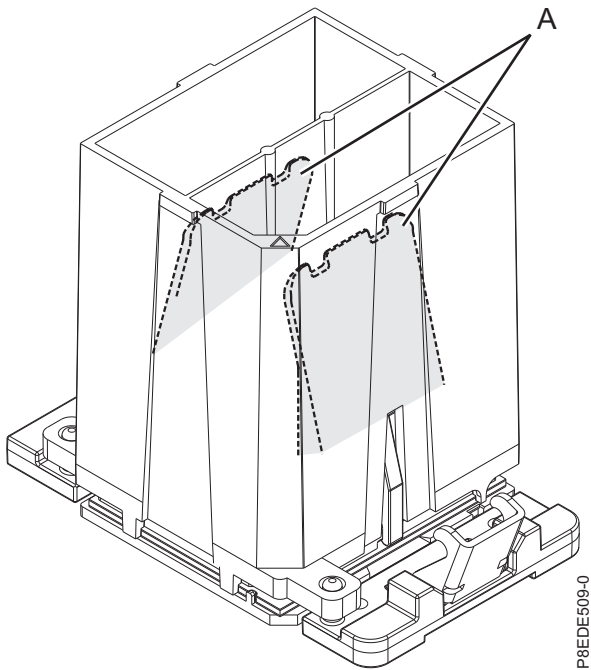
Figure 192. Removing the system processor module tool

6. Inspect the thermal interface material (TIM) for visible signs of damage as shown in Figure 193.

   The thermal interface material (TIM) is typically adhered to the cold plate. Unless damaged, the TIM that is adhered to the cold plate can be reused.
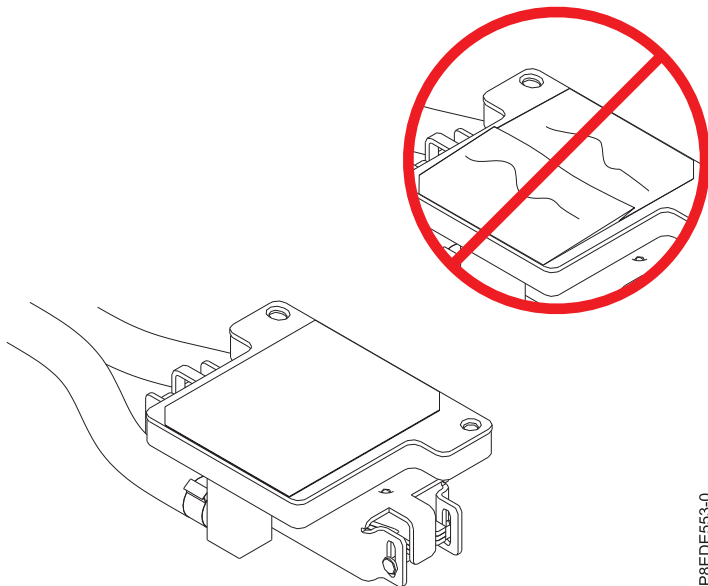
Figure 193. Inspecting the thermal interface material

7. Are you replacing the TIM?

   Yes: Continue with step 8 on page 169.

   No: Go to step 9 on page 169.

8. Install a new TIM pad:

   a. Use the supplied scraper to remove the old TIM from the cold plate.

   b. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

   c. Remove the protective film from the clear carrier strip by using the supplied tweezers.

      Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

   d. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The side with the red stripe must be facing up. Align the beveled edges of the TIM and the system processor module **(A)** as shown in Figure 194.
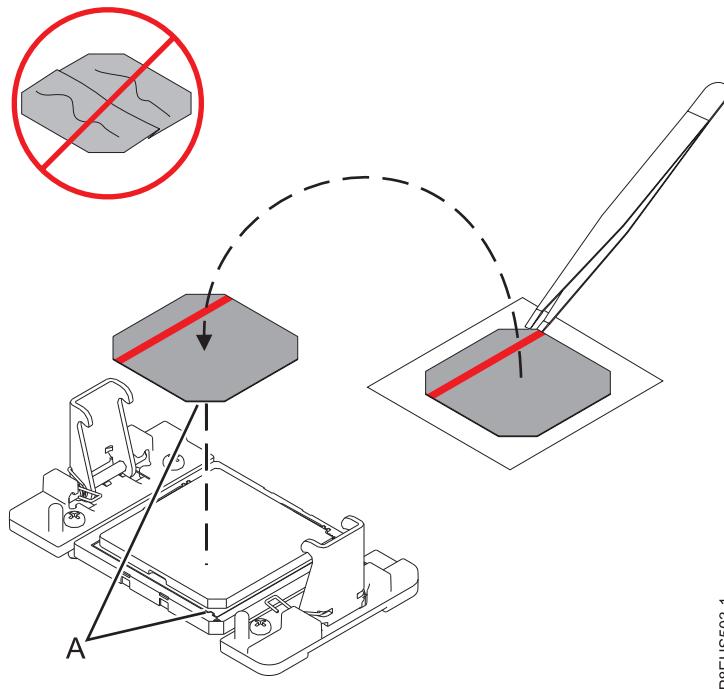
Figure 194. Installing the TIM onto the processor lid

9. Install the cold plate.

   a. Unhook the cold plate **(A)** from the service hook **(B)** and carefully align the cold plate onto the system processor module as shown in Figure 195 on page 170.
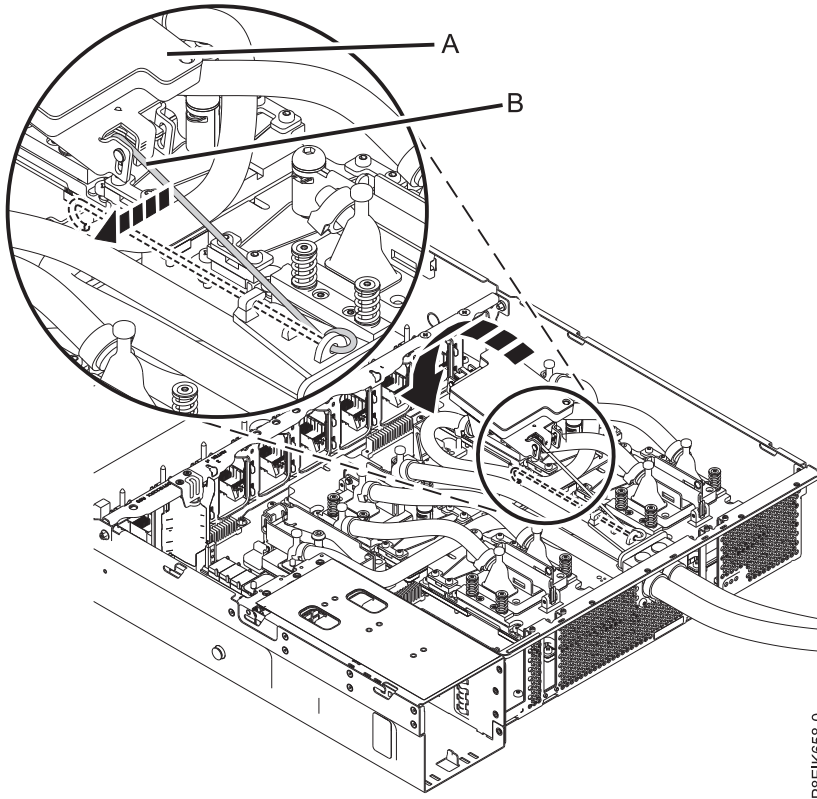
Figure 195. Aligning the cold plate on the system processor module

   b. Tighten the cold plate retainer screw with the supplied hex key as shown in Figure 196 on page
      171.
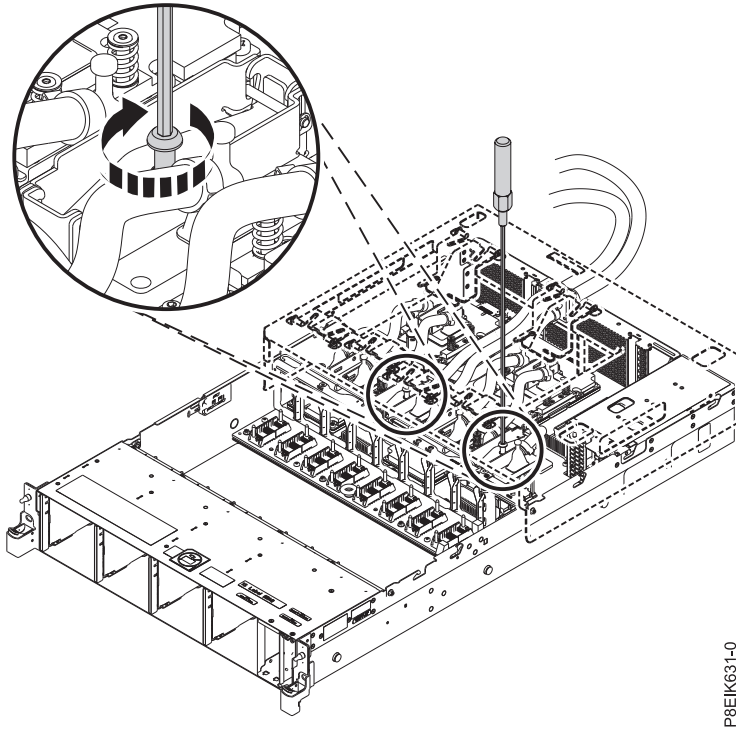
Figure 196. Tightening the cold plate retainer screw

    c. Return the service hook to its latched position in the bracket.

10. Lightly grip the system processor module that you replaced by the edges and lift it off of the packaging cover. Align the beveled corner of the module **(A)** to the corner of the packaging with triangle **(B)** and place it in the packaging, as shown in Figure 197. Close the packaging cover.
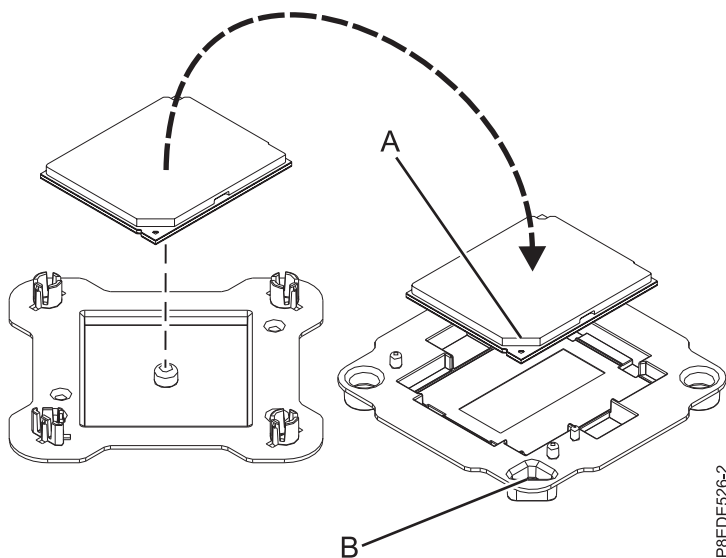
Figure 197. Placing the system processor module into the packaging

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the time-of-day battery in the 8335-GTB

Learn how to remove and replace a time-of-day battery in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the 8335-GTB system to remove and replace internal parts" on page 195.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

Remove:

2. Remove the power riser air baffle. Using the blue tabs **(A)**, unsnap the baffle and lift it from the system. See Figure 198.
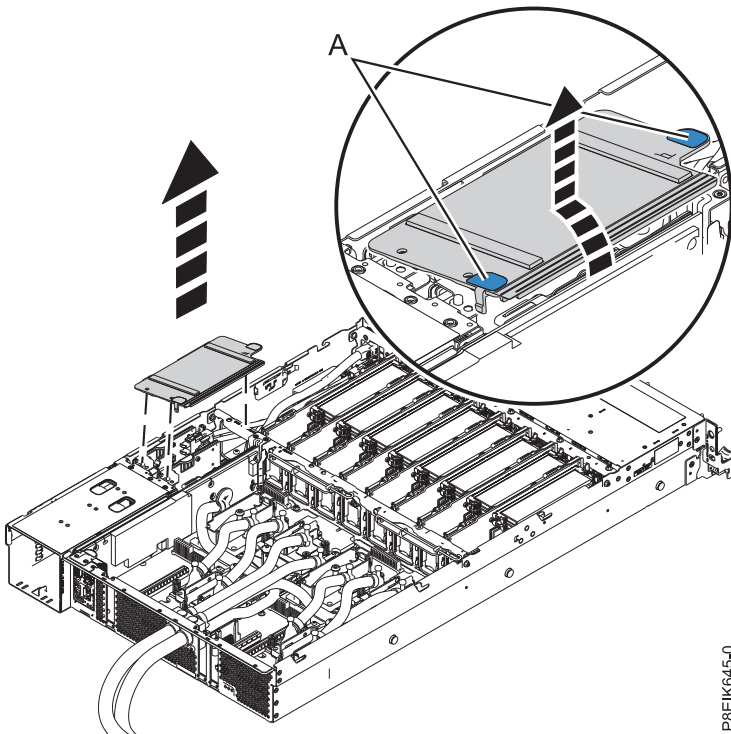
Figure 198. Removing the power riser air baffle

3. Locate the time-of-day battery on the power riser nearest to the side of the system as shown by **A** in Figure 199.
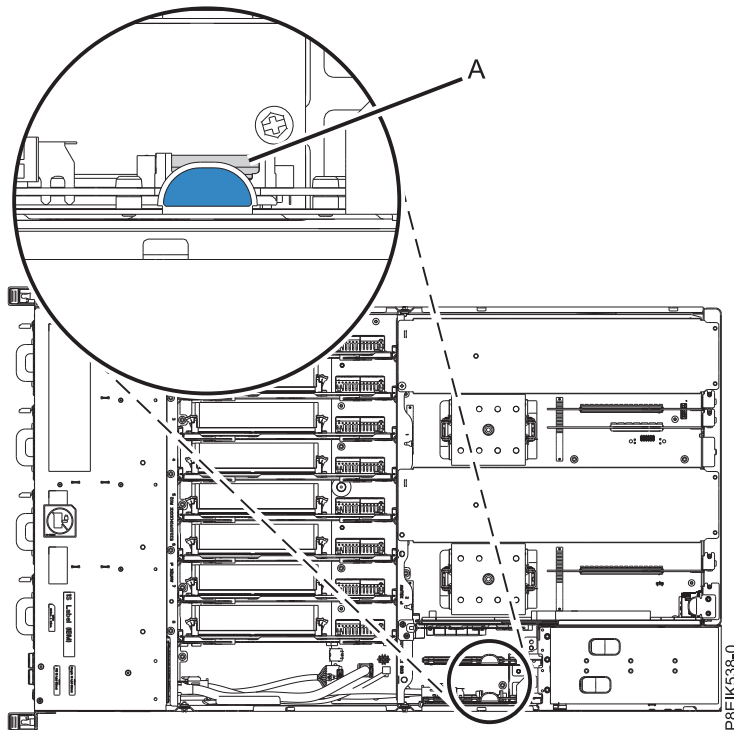
Figure 199. Location of the time-of-day battery

4. Remove the power riser that contains the time-of-day battery.
   a. Grasp the connector end of the fan power cable that is connected to the power riser. See **(A)** in Figure 200 on page 174.
   b. While you press the latch release lever with your thumb, disconnect the cable from the connector.

      Note: The latch release on the connector must be depressed before you unplug the cable. Failure to do so might damage the cable and the connector.
   c. Pull the power riser from the slot by holding the blue tab. See **(B)** in Figure 200 on page 174.
   d. Place the power riser on an ESD mat.
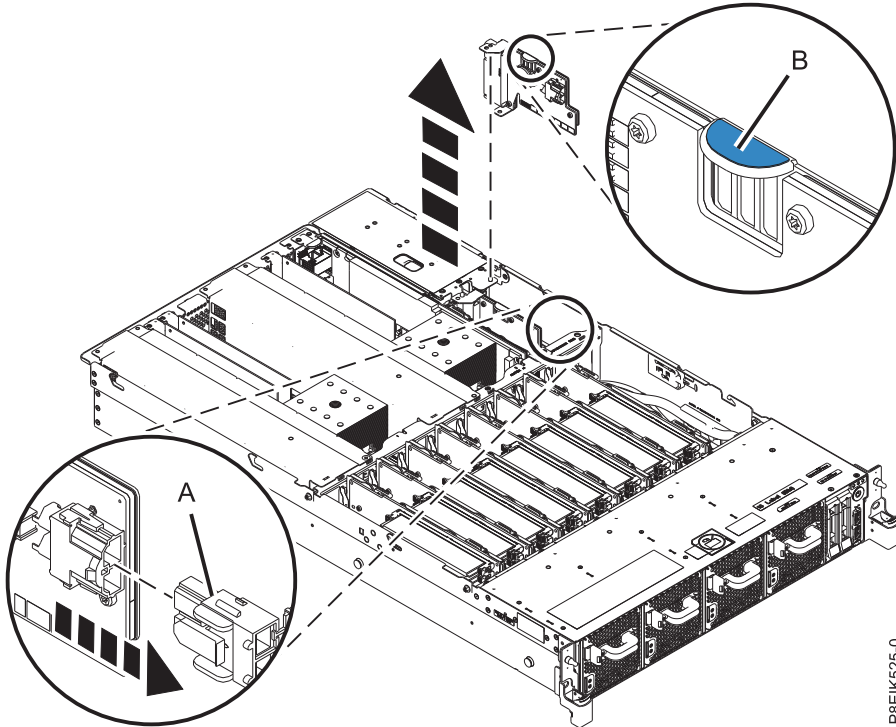
Figure 200. Removing the power riser from the system

5. Remove the time-of-day battery from its slot on the power riser as shown in Figure 201. Ensure to record the orientation of the polarity of the battery so that you can insert it with the same orientation later.

Replace:
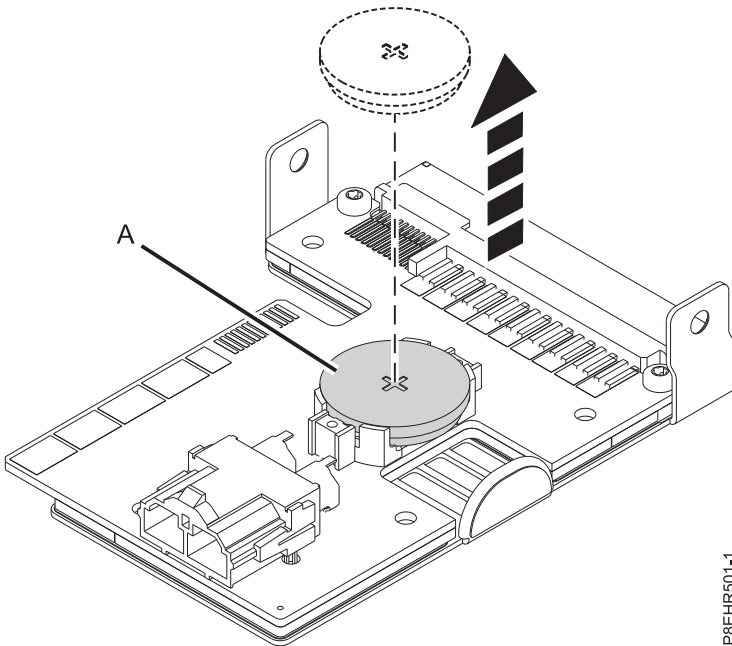
Figure 201. Removing the time-of-day battery from the power riser

6. Insert the time-of-day battery in the slot on the power riser as shown in Figure 202. Ensure to insert the battery with the correct polarity as recorded during removing of the battery.
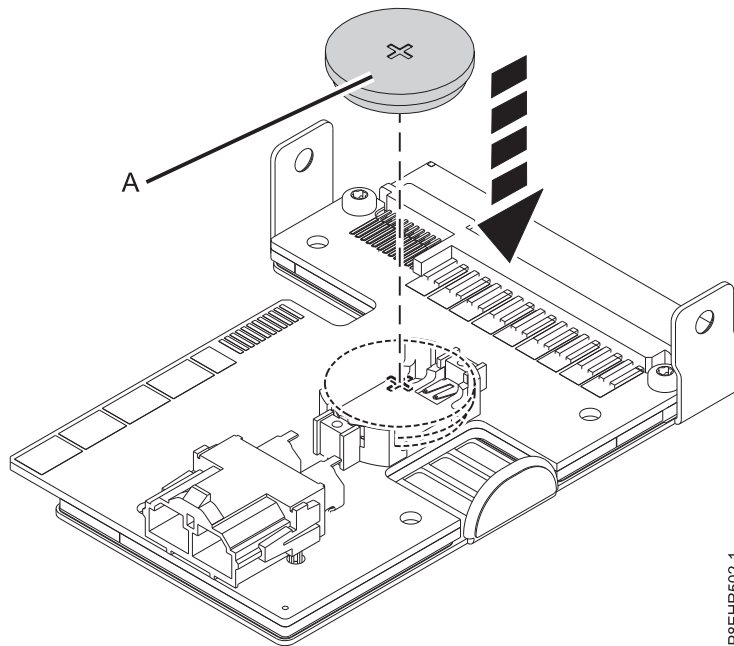
Figure 202. Replacing the time-of-day battery on the power riser

7. To replace a power riser, complete the following steps:
   a. Hold the power riser by the blue tab.
   b. Using the alignment pins **(A)**, insert the power riser into the slot. See Figure 203 on page 176.
   c. Reconnect the fan power cable to the power riser. See **(C)** in Figure 203 on page 176.
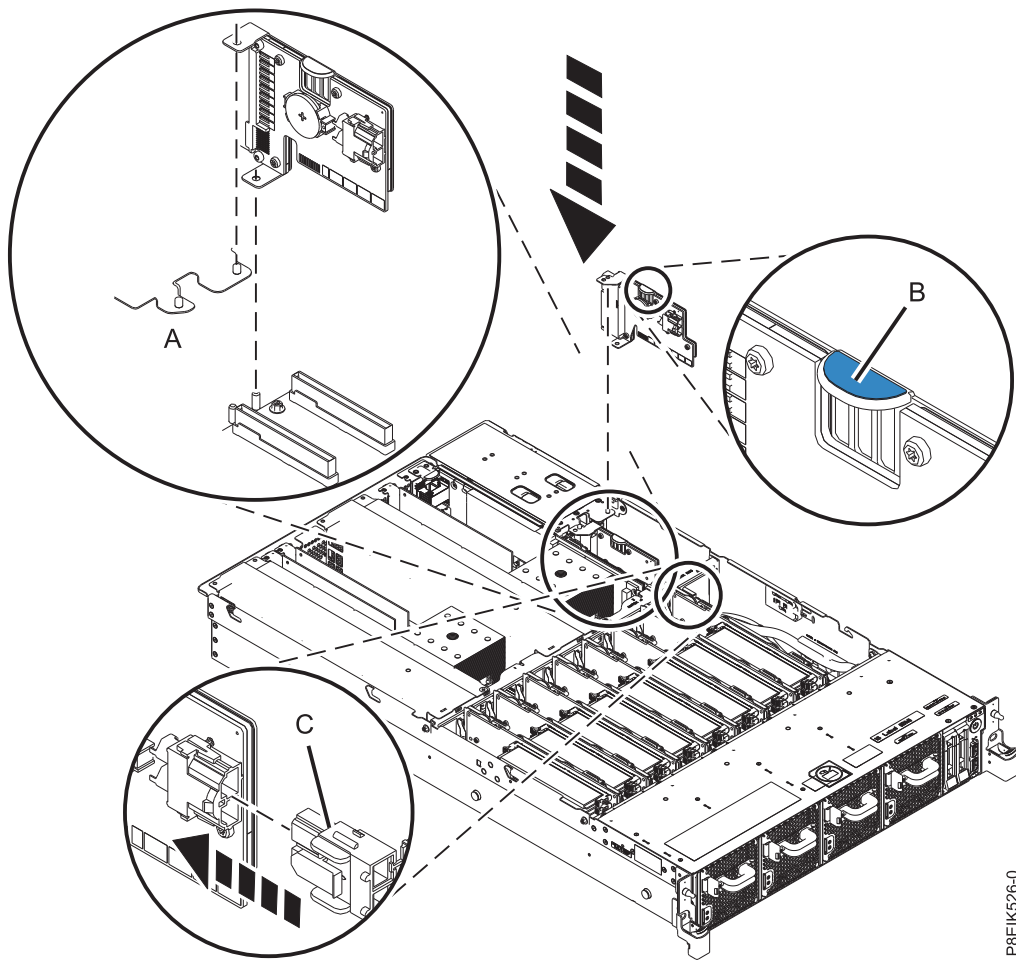
Figure 203. Replacing a power riser in the system

8. Install the power riser air baffle. Ensure that the holes in the baffle align with the pins on the system. Using the blue tabs **(C)**, insert the edge **(A)** of the baffle into the side of the system **(B)**. Then snap the baffle down into place. See Figure 204 on page 177.
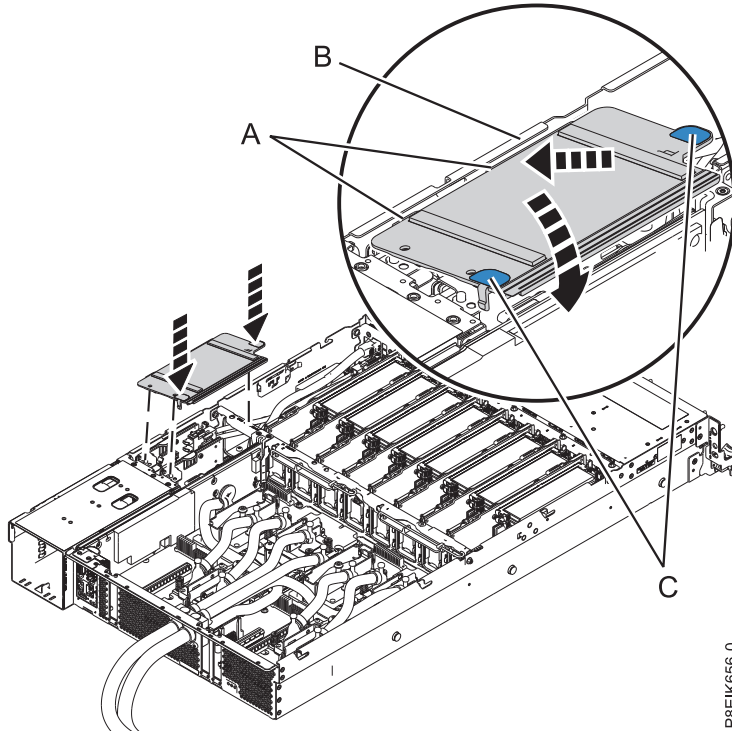
Figure 204. Installing the power riser air baffle

What to do next

Prepare the system for operation. For instructions, see "Preparing the 8335-GTB system for operation after you remove and replace internal parts" on page 198.

Removing and replacing the water manifold in the 8335-GTB

Learn how to remove and replace the water manifold in the IBM Power System S822LC (8335-GTB) system.

Preparing the 8335-GTB system to remove the water manifold

Learn how to prepare to remove the water manifold for the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Complete the prerequisite tasks. For instructions, see "Before you begin" on page 189.
2. Stop the system. For instructions, see "Stopping the 8335-GTB system" on page 199.
3. Repeat step 2 for all the systems in the rack.
4. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
- When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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 source from the system by unplugging the system. For instructions, see "Disconnecting the power cords from an 8335-GTB system" on page 211.

Note: The system might be equipped with redundant power supply. Before you continue with this procedure, ensure that all power to your system is disconnected.

(L003)

or

or

or

or
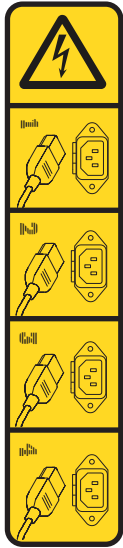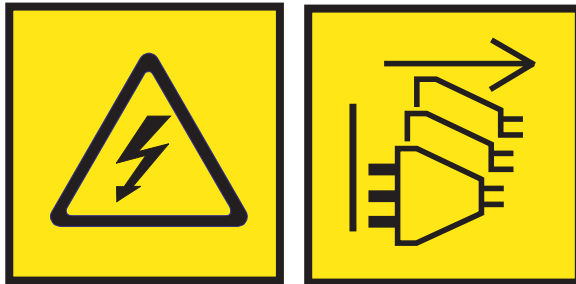
DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L005)

CAUTION: Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)

6. Repeat step 5 on page 178 for all the systems in the rack.

7. Label and disconnect the external cables that are connected to the systems that are in the rack.

8. Label and disconnect the water hoses at the manifold for each server in the rack. Pull the coupling toward you to disconnect the water hoses as shown in Figure 205 on page 180.
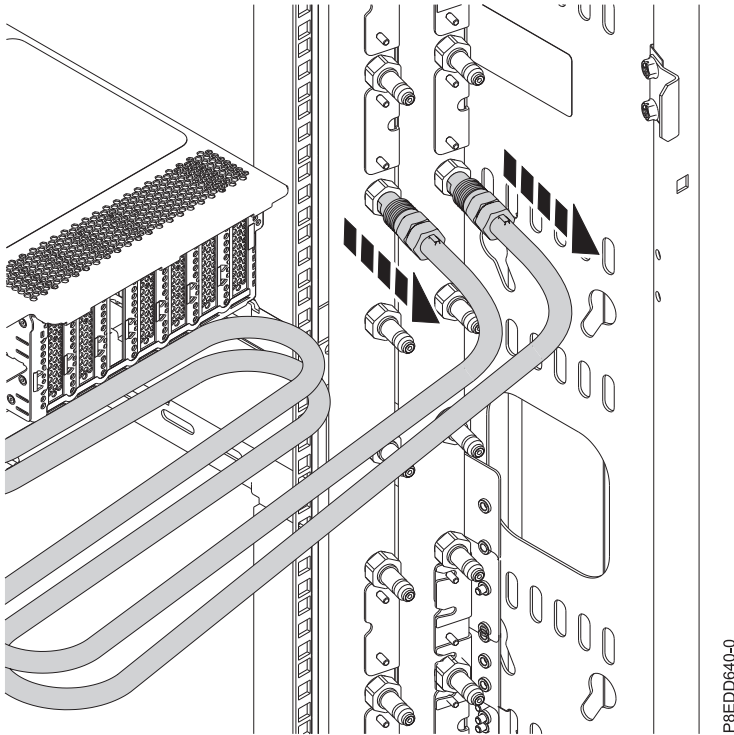
Figure 205. Disconnecting the water hoses

9. Remove the system from the rack.

   CAUTION:

   This system requires two people to remove the system from the rack.
   For instructions, see "Placing an 8335-GTB system into the service position" on page 205. If your rack has slider rails; remove the system from the rails.

10. Remove the rack rail on the side of the rack where the manifold is mounted.

11. Repeat step 7 on page 179 through step 10 for each system in the rack.

Removing the water manifold from the 8335-GTB

Learn how to remove the water manifold for the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is connected to an unpainted metal surface. If not, do so now.

2. To close the valves, rotate the lever of the quick connect ball valve fittings of the manifold hose and the facility water supply hose in the direction that is shown. Press the pin on the valve lever while you rotate it 90 degrees to close it.
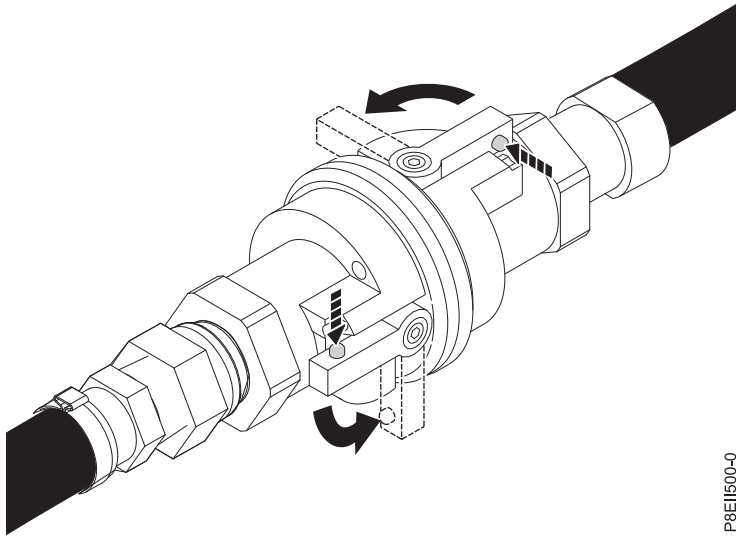
Figure 206. Closing the manifold and facility water hose valves

3. Repeat step 2 on page 180 to close the valve of the facility water return hose.

4. Twist the quick connect ball valve fittings on the manifold hose and on the facility water supply hose a quarter-turn in the direction shown. Then, disconnect the hoses.
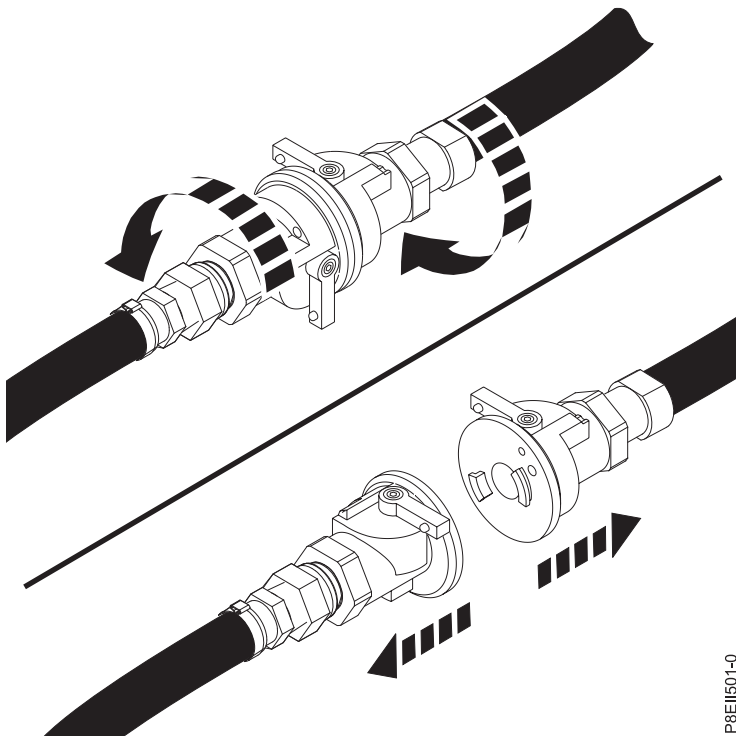
Figure 207. Disconnecting the hoses

5. Repeat step 4 to disconnect the facility water return hose.

6. Loosen the four nuts that attach the manifold to the mounting brackets by using a 7 mm nut driver. Then, remove the manifold.
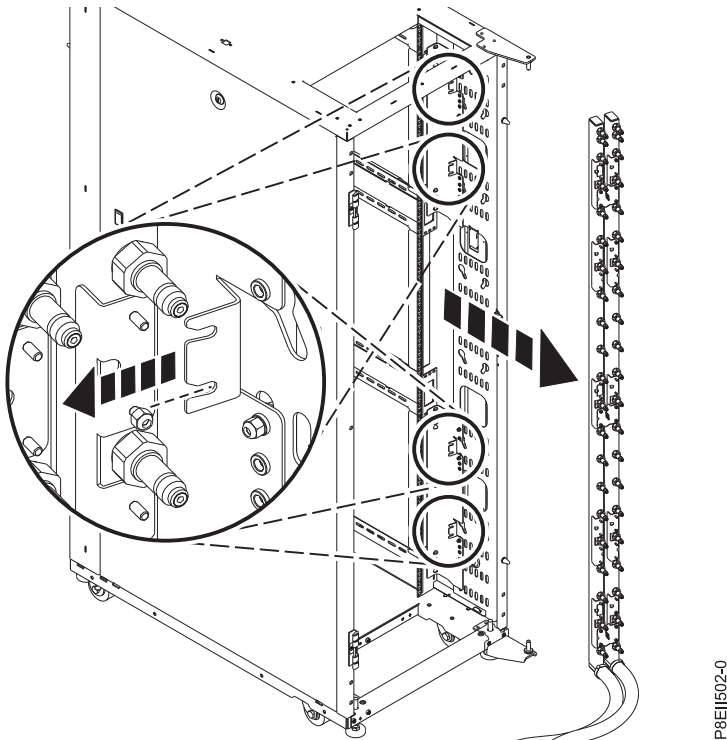
P8EII502-0

Figure 208. Removing the manifold

7. Drain the remaining water in the manifold by completing the following steps:

   Note: Two people are needed to properly drain the manifold.
   a. Have a bucket ready to collect the water of at least 2 gallons.
   b. Hold the manifold upright, with the hoses facing down.
   c. Take one of the manifold quick connect valves and hold it over the bucket.
   d. To open the ball valve, press the pin on the face of the fitting, then press the pin on the lever and turn the lever 90 degrees.
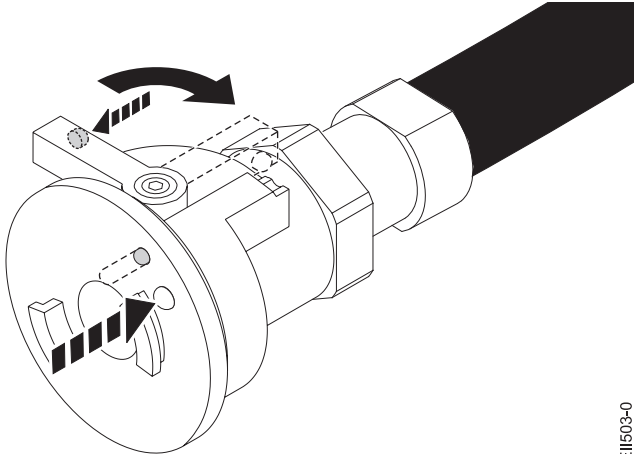
P8EII503-0

Figure 209. Opening the ball valve

e. A second person is needed to raise the manifold assembly above the hose and the bucket so that the water can drain from the manifold and the hose into the bucket.

f. Repeat step 7 on page 182 for the remaining water hose.

Replacing the water manifold in the 8335-GTB

Learn how to replace the water manifold for the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is connected to an unpainted metal surface. If not, do so now.

2. If the original manifold FRU had the facility supply and return water hoses exiting the top of the rack, complete this step to reconfigure the replacement manifold FRU. Otherwise, skip this step.

   a. Unscrew and remove the four nuts of each manifold z bracket by using a 7 mm nut driver. Remove the three manifold z brackets and separate the manifold halves.
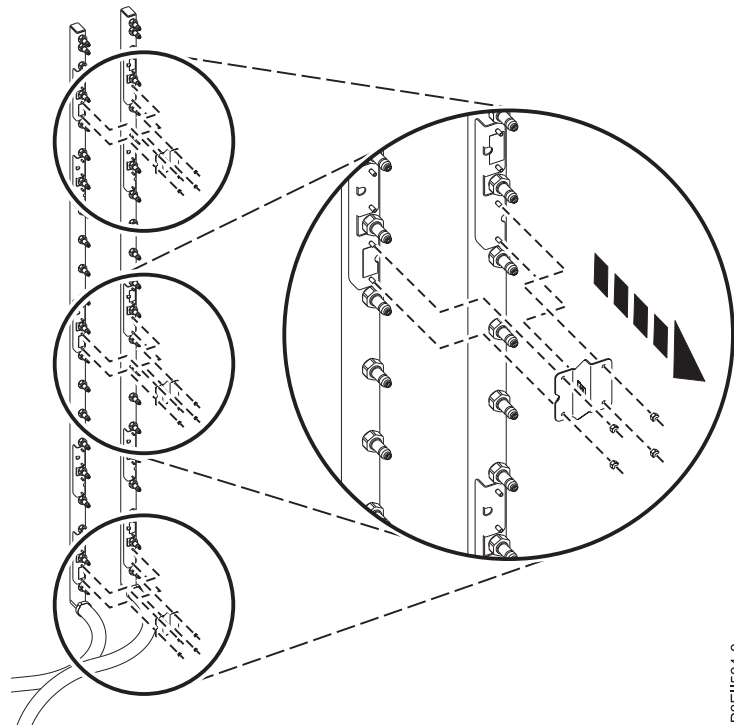
Figure 210. Removing the manifold z brackets

   b. Flip the manifold halves so that the hoses are at the top of the manifold. Ensure that the following criteria are met:

   - The supply manifold half is toward the inside of the rack.
   - The return manifold half is toward the outside of the rack.
   - Align the manifold halves such that the supply manifold half is lower than the return manifold half.

   Align the z brackets to the manifold. Use the labels on the bracket and the manifold to properly align the brackets. Then, by using a 7 mm nut driver, reattach the manifold z brackets by installing and tightening the four nuts of each bracket.

   Note: The z brackets are installed on different studs when the manifold is configured with the water hoses exiting the top of the rack than when the manifold is configured with the water hoses

exiting the bottom of the rack.
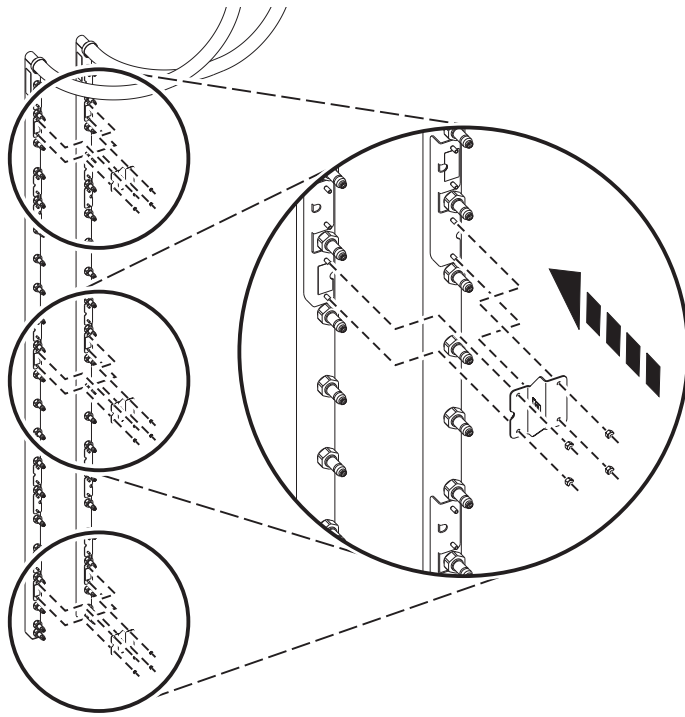
P8EII505-0

Figure 211. Installing the manifold z brackets

3. Align the manifold to the mounting bracket slots, then attach the manifold by using a 7 mm nut driver.
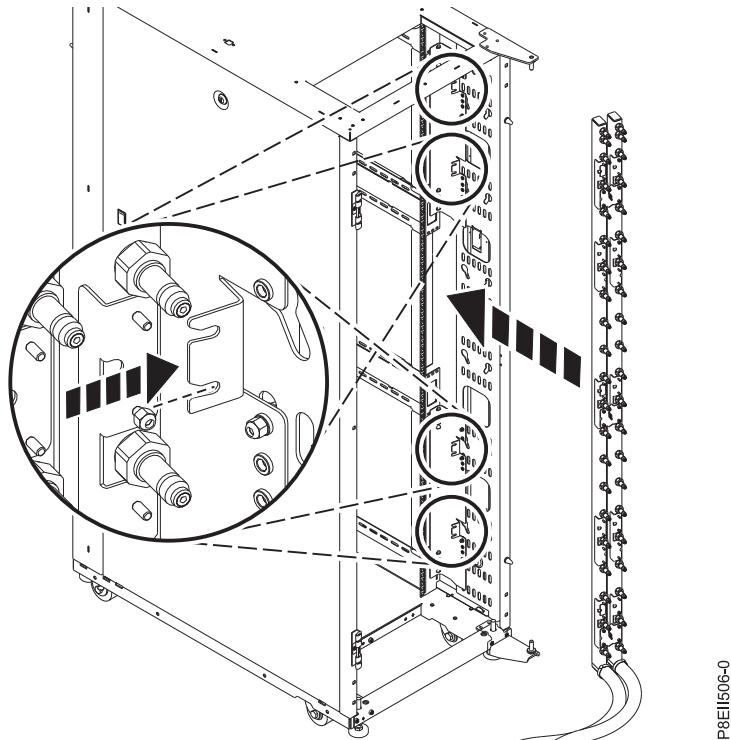
Figure 212. Installing the manifold with the hoses exiting the bottom of the rack

4. Connect the facility water supply hose to the manifold hose. Align the two quick connect ball valve fittings, then turn the fittings a quarter-turn to lock the fittings. Then, press the pin on the lever and turn the lever 90 degrees to open one side of the valve. Then, press the pin on the other lever and turn the lever 90 degrees to open the other side of the valve.
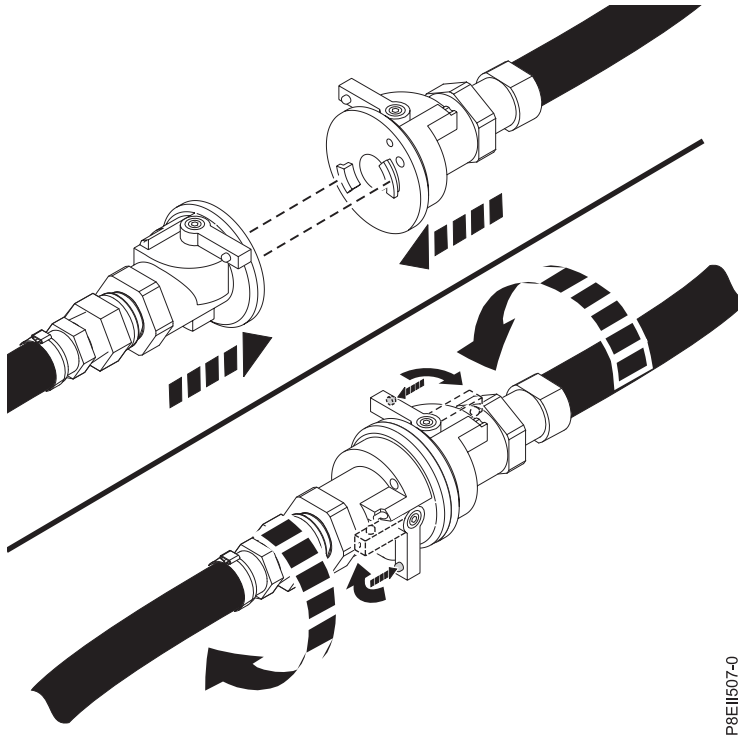
P8EII507-0

Figure 213. Connecting the hoses and opening the valves

5. Repeat step 4 on page 185 to connect the facility water return hose to the manifold hose.

Preparing the 8335-GTB system for operation after you replace the water manifold

Learn how to prepare the IBM Power System S822LC (8335-GTB) system for operation after you replace the water manifold.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is connected to an unpainted metal surface. If not, do so now.
2. Replace the rack rail on the side of the rack where the manifold is mounted.
3. Replace the system into the rack.

   CAUTION:

   This system requires two people to replace the system into the rack.
   If your rack has slider rails; replace the system on the rails. Place the system into the operating position. For instructions, see "Placing an 8335-GTB system into the operating position" on page 207.
4. Using your labels, reconnect the external cables to the system.
5. Reconnect the water hoses at the rear of the rack, as shown in Figure 214 on page 187.
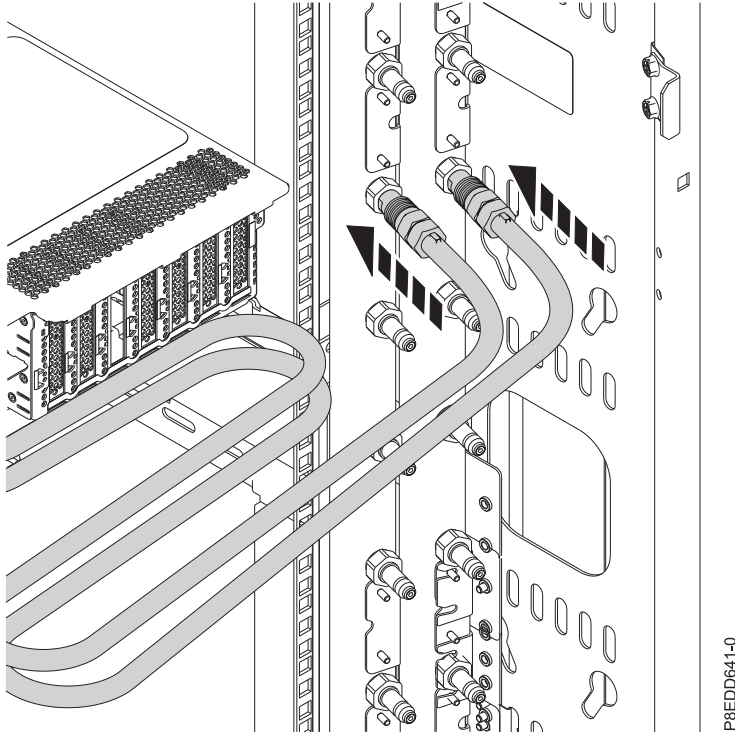
Figure 214. Reconnecting the water hoses

6. Repeat step 2 on page 186 through step 5 on page 186 for each system in the rack.
7. Reconnect the power cords to the system. For instructions, see "Connecting the power cords to an 8335-GTB system" on page 213.
8. Repeat step 7 for all the systems in the rack.
9. Start the system. For instructions, see "Starting the 8335-GTB system" on page 199.
10. Repeat step 9 for all the systems in the rack.
11. Verify the installed part. See Verifying a repair (www.ibm.com/support/knowledgecenter/ POWER8//p8ei3/p8ei3_verifyrepair.htm).

Common procedures for servicing or installing features in the 8335-GTB

Learn about the common procedures related to installing, removing, and replacing features in the IBM Power System S822LC (8335-GTB) system.

Before you begin

Observe these precautions when you are installing, removing, or replacing features and parts.

About this task

These precautions are intended to create a safe environment to service your system and do not provide steps for servicing your system. The installation, removal, and replacement procedures provide the step-by-step processes that are required to service your system.

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

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:
- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

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. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).

- Each rack cabinet might have more than one power cord.
  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, 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.

(R001 part 2 of 2):

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.

(L003)

or
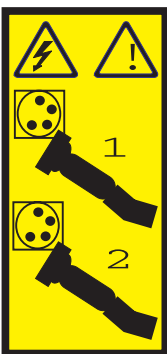
or

or

or

DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L005)

CAUTION: Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)

Procedure

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

1. If you are installing a new feature, ensure that you install the required software to support the new feature. See IBM Prerequisite.
2. If you are installing or replacing something that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).

3. Review the installation or replacement procedure for the feature or part.

4. Note the significance of color on your system.

   Blue or terracotta 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. Terracotta 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, a Phillips screwdriver, and a pair of scissors.

6. If parts are incorrect, missing, or visibly damaged, do the following steps:
   - If you are replacing a part, contact the provider of your parts or next level of support.
   - If you are installing a feature, contact one of the following service organizations:
     – The provider of your parts or next level of support.
     – In the United States, the IBM Rochester Manufacturing Automated Information Line (R-MAIL) at 1-800-300-8751.

   In countries and regions outside of the United States, use the following website 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. For the IBM Power System S822LC (8335-GTB) systems, ensure that the top cover is on when the system is running for thermal performance.

Identifying the system that contains the part to replace

Learn how to determine which server or enclosure has the part you want to replace.

About this task

If the part does not have problem indicator LED, you will need to use a troubleshooting program such as **impitool** to identify the issue.

LEDs on the 8335-GTB system

Use this information as a guide to the LEDs on the IBM Power System S822LC (8335-GTB) system.

The LEDs indicate various system status. These LEDs are at the front (as shown in Figure 215 on page 194 and Figure 216 on page 194) and at the rear of the system (as shown in Figure 217 on page 194).

- The green LED indicates the power status.
  – A constant light indicates full system power to the unit.
  – A flashing light indicates standby power to the unit.
- The amber LED indicates a problem in the system. After a part is repaired, the amber LED takes a minute to turn off.
- The blue LED is used to identify the system that requires service.
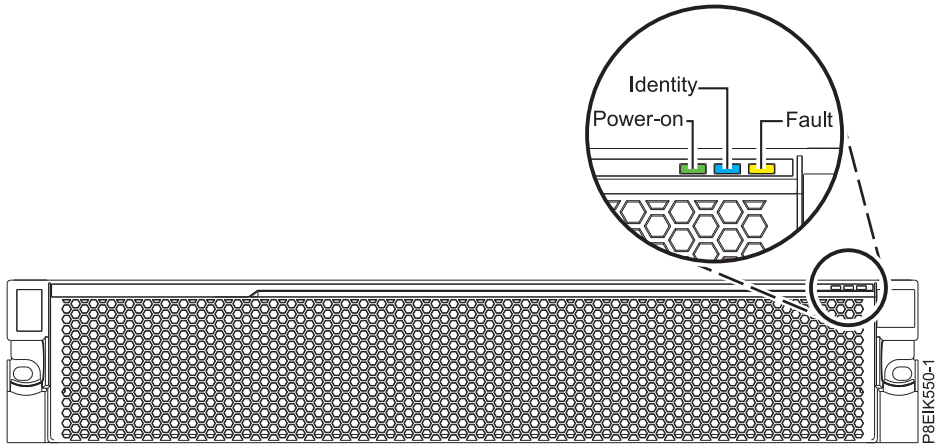
Figure 215. Front LEDs with bezel on
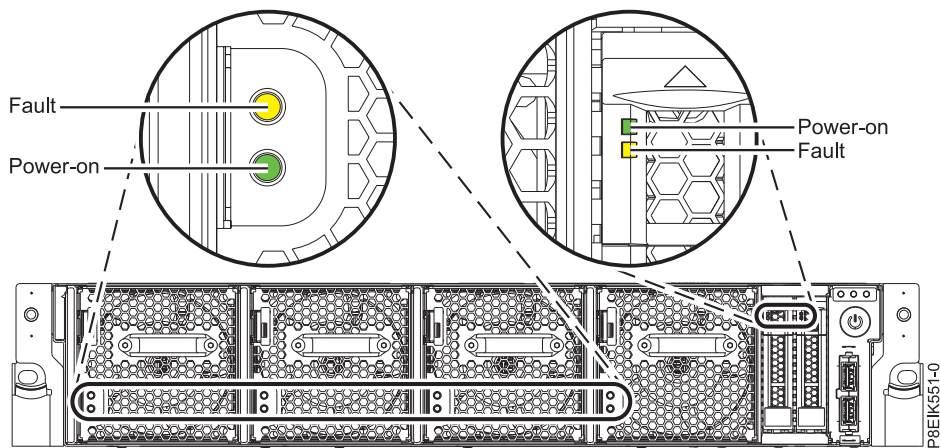
Figure 216. Front LEDs with bezel off
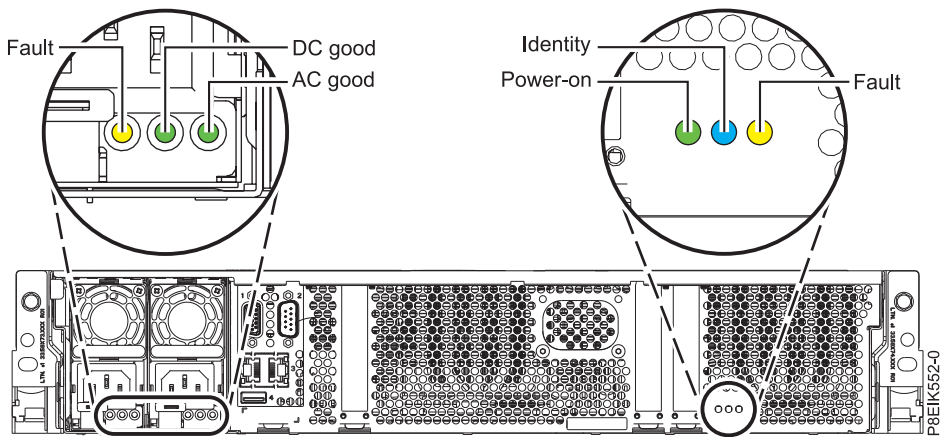
Figure 217. Rear LEDs

LED indicators are on the following parts:
- At the front of the system:

- Disk drives (green LED indicates activity; amber LED indicates a problem)
- Fans (green LED indicates activity; amber LED indicates a problem)
- At the rear of the system:
  - Backplane, near the rightmost PCIe slot port: Green, amber, and blue (same as on the front next to the power button)
  - Power supplies (Two green LEDs indicate AC and DC power; amber LED indicates a problem)

Identifying the 8335-GTB that needs servicing

Use the Intelligent Platform Management Interface (IPMI program to turn on the blue identify LED to help you find the IBM Power System S822LC (8335-GTB) system that needs servicing.

Procedure

Use the **ipmitool** command to activate the blue system identify LED.
For in-band networks, the chassis identify command is:

```
ipmitool -I <interface> chassis identify <interval>
```

Where:

interface
> Is the interface that you are using to connect to the system; for example, `usb`.

interval
> Is the time to turn on the identify LED in seconds. The default is 15; meaning the LED is on for 15 seconds then turns off. A value of zero (0) turns off the LED. A value of `force` turns on the LED and leaves it on until turned off.

To run the command remotely over the LAN, the chassis identify command to enter is:

```
ipmitool -I lanplus -H <hostname> -U <username> -P <password> chassis identify <interval>
```

Preparing the 8335-GTB system to remove and replace internal parts

To prepare the IBM Power System S822LC (8335-GTB) system to remove and replace internal parts, complete the steps in this procedure.

Procedure

1. Complete the prerequisite tasks. For instructions, see "Before you begin" on page 189.
2. Identify the part and the system that you will be working on. For instructions, see "Identifying the system that contains the part to replace" on page 193.
3. If applicable, open the rack front door.
4. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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 front cover. For instructions, see "Removing the front cover from an 8335-GTB system" on page 204.

(L007)

CAUTION: A hot surface nearby. (L007)

6. Stop the system. For instructions, see "Stopping the 8335-GTB system" on page 199.
7. If applicable, open the rack door at the rear of the system.
8. Disconnect the power source from the system by unplugging the system. For instructions, see "Disconnecting the power cords from an 8335-GTB system" on page 211.

   Note: The system might be equipped with redundant power supply. Before you continue with this procedure, ensure that all power to your system is disconnected.

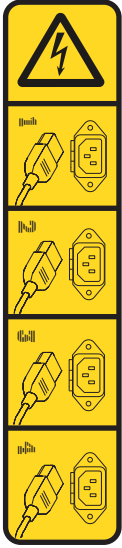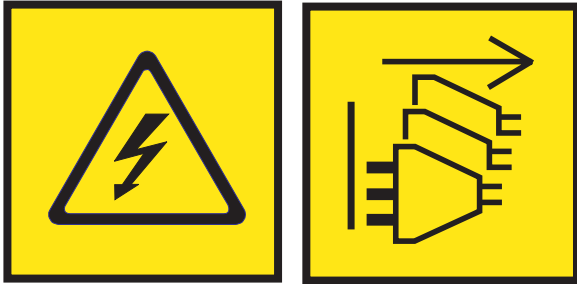   **(L003)**

   or

   or

   or

or
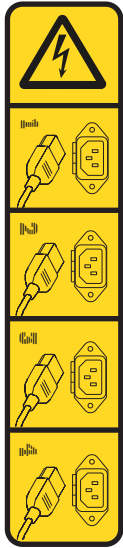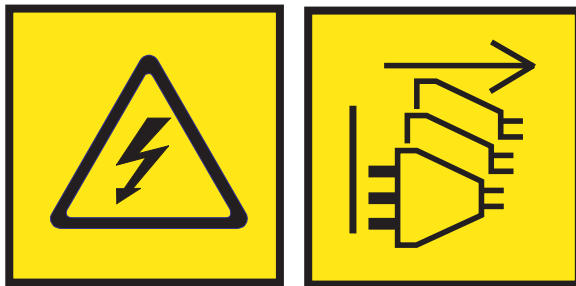
DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L005)

CAUTION: Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)

9. Remove the two power supplies from the system. For instructions, see "Removing a power supply from the 8335-GTB" on page 209.

10. Place the system into the service position. For instructions, see "Placing an 8335-GTB system into the service position" on page 205.

   CAUTION:
   Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf. (R008)

   (L012)

CAUTION: Pinch hazard. (L012)

11. Remove the service access cover. For instructions, see "Removing the service access cover from an 8335-GTB system" on page 202.

Preparing the 8335-GTB system for operation after you remove and replace internal parts

To prepare the IBM Power System S822LC (8335-GTB) system for operation after you remove and replace internal parts, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Replace the service access cover. For instructions, see "Installing the service access cover on an 8335-GTB system" on page 203.

3. Place the system into the operating position. For instructions, see "Placing an 8335-GTB system into the operating position" on page 207.

   (L012)

   CAUTION: Pinch hazard. (L012)
   Attention: For a water cooled system, before powering on the system, ensure that cooling water is circulating through the system.

4. Install both of the power supplies into the system. For instructions, see "Replacing a power supply in the 8335-GTB" on page 210.

5. Reconnect the power cords to the system. For instructions, see "Connecting the power cords to an 8335-GTB system" on page 213.

6. If applicable, close the rack door at the rear of the system.

7. Start the system. For instructions, see "Starting the 8335-GTB system" on page 199.

8. Replace the front cover. For instructions, see "Installing the front cover on an 8335-GTB system" on page 204.

9. If applicable, close the rack front door.

10. Verify the installed part. See Verifying a repair (www.ibm.com/support/knowledgecenter/POWER8//p8ei3/p8ei3_verifyrepair.htm).

Starting and stopping the 8335-GTB

Learn how to start and stop the IBM Power System S822LC (8335-GTB) system to do a service action or system upgrade.

Starting the 8335-GTB system

You use the power button to start the IBM Power System S822LC (8335-GTB) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated prior to powering the system on.

Attention: For a water cooled system, before powering on the system, ensure that cooling water is circulating through the system.

You can use this procedure to power on the system; or you can use a console and the IPMI tool to power on the system.

Procedure

1. Open the front rack door, if necessary.
2. Before you press the power button, ensure that the power supplies are connected to the system unit and verify the following items:
   - All system power cables are connected to a power source.
   - The power-on LED as shown in Figure 218, is flashing. A flashing light indicates standby power to the unit.
3. Press the power button shown in Figure 218. The power-on light stops flashing and remains on, indicating that the system power is on. The system cooling fans run at a high speed, and after approximately 30 seconds, return to operating speed.
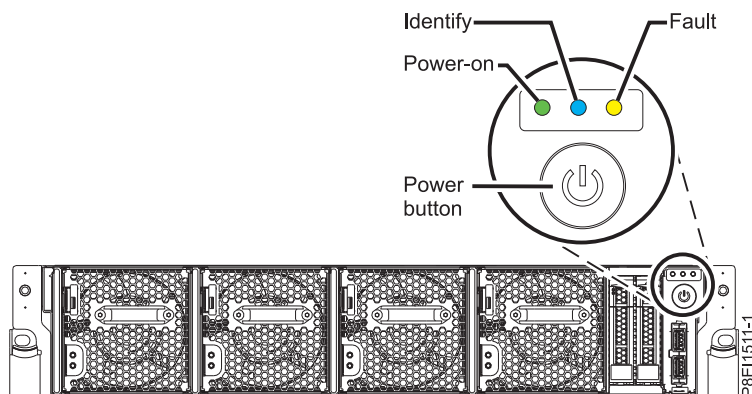
Figure 218. Power button

What to do next

If you press the power button and the system does not start, contact your next level of support or your service provider.

Stopping the 8335-GTB system

Learn how to stop the IBM Power System S822LC (8335-GTB) system to complete another task.

Procedure

You can use the Linux **shutdown** command to stop and power down the system.
For example, the following command will shut down the system in 10 minutes and send the message
"Repairs coming." to the users.

```
shutdown -P +10 "Repairs coming."
```

The **-P** setting instructs the system to shut down and then power down. The + indicates the time in
minutes before the shutdown occurs.

Event sensor status GUI display

The event sensor status GUI display is a way to quickly determine the general health status of the server
without having to look at the detailed system event log (SEL) information.

To view the event sensor status GUI display, log in to the BMC web interface. The sensors and values
appear on the first page (the dashboard).

Some occurrences of errors in the system might not appear in the event sensor GUI. After you view the
event sensor status GUI display, use the SEL logs to view any active SEL events that indicate a service
action event.

Event sensor status display operation

Most sensors are initially gray, then change status and color during the boot process when the FRU is
initialized and either determined to be good (green) or faulty (red). No sensor display is available until
you can get to the sensor display selection on the BMC, which means that the system attains a certain
power level or that the BMC finishes initializing. The indicator color of the sensor is determined based on
the sensor status at time of invocation of the display. The sensor display maintains the sensor status
indicator color until the display is refreshed, which updates the sensor value with the latest status.
Changes to SEL events changes color of sensor indicator when you refresh or restart the display. Sensor
status display also starts over with a reboot or a power cycle with a few exceptions, indicated in Table 3
on page 201.

Event sensor status indicator descriptions

Gray indicator:
• FRU not plugged
• Sensor not initialized
• Sensor function is not initialized

Red (faulty) indicator:
• Critical threshold exceeded (an event requires a service action)
• Service action required for hard fail
• Partial function failure that reached a "service action required" state
• A deconfigured resource requires service action

Green (good) indicator:
• FRU or sensor is plugged in and fully operational
• Recoverable event is below the critical "service action required" threshold
• FRU or sensor returned to "normal" operating range (for threshold sensors)

Sensor state values during boot process

The key stages of operation.

Initial power on to BMC ready state
> In this stage, some indicator values might not reflect the status of the physical sensor. In some instances, the state is not available because the sensor is not initialized; in this case, the sensor color is gray. In other cases (typically associated with Host Boot sensors), the value of the sensor shows the state when the system was operational. These sensors update to indicate the current status if the display is refreshed when the system reaches the Petitboot stage of operation. Table 3 shows the affected indicators.

BMC ready to PetitBoot or Host operation state
> When the system reaches the Petitboot menu stage, and you refresh the display, all of the indicators reflect their operational state.

Table 3. Sensors and values during the stages of system operation

Sensor Name	Value at BMC Ready	Value at Petitboot or Later
Mem Buf Temp x (x = 0 - 7)	Not Available	Current
CPUx Temp (x = 0 - 1)	Not Available	Current
CPU Core Temp x (x = 0 - 23)	Not Available	Current
DIMMx Temp (x = 0 – 31)	Not Available	Current
GPU Temp x (x = 1 – 4)	Not Available	Current
CPU Diode x (x = 1 – 2)	Current	Current
Ambient Temp	Current	Current
CPU VDD Volt	Not Available	Current
CPU VDD Current	Not Available	Current
Fan x (x = 0 – 5)	Not Available	Current
Mem Buf Func x (X = 0 – 7)	From Previous IPL	Current
DIMM Func x (x = 0 – 31)	From Previous IPL	Current
GPU Func x (x = 1 – 4)	Not Available	Current
CPU Core Func x (x = 0 – 23)	From Previous IPL	Current
CPU Func x (X = 0 – 1)	From Previous IPL	Current
Checkstop	Current	Current
Quick Power Drop	Current	Current
OCC x Active (x = 1 – 2)	Current	Current
PSU Fault x (x = 1 – 2)	Current	Current
All Pgood	Current	Current
FW Boot Progress	From Previous IPL	Current
Host Status	Current	Current
Watchdog	From Previous IPL	Current
System Event	From Previous IPL	Current
OS Boot	From Previous IPL	Current
PCI	From Previous IPL	Current
Mem ProcX Pwr (x = 0 – 3)	Not Available	Current
Procx Power (x = 0 – 1)	Not Available	Current
PCIE Procx Pwr (x = 0 – 1)	Not Available	Current

Table 3. Sensors and values during the stages of system operation (continued)

Sensor Name	Value at BMC Ready	Value at Petitboot or Later
Fan Power A (Fan Power)	Not Available	Current
Mem Cache Power	Not Available	Current
12V Sense	Not Available	Current if applicable
GPU Sense (GPU Power)	Not Available	Current
IO (A-B) Power	From Previous IPL	Current
Storage Power (A-B)	From Previous IPL	Current
Motherboard Flt	From Previous IPL	Current
Ref Clock Fault	From Previous IPL	Current
PCI Clock Fault	From Previous IPL	Current
TOD Clock Fault	From Previous IPL	Current
APSS Fault	From Previous IPL	Current
BMC Golden Side	Current	Current
BIOS Golden Side	Current	Current
Boot Count	Current	Current
Activate Pwr Lt	From Previous IPL	Current
PS Derating Fac	Current	Current
NxtPwr Redundant	Current	Current
CurPwr Redundant	Current	Current
System Power	Not Applicable	Current if applicable
Freq Limit OT x (x = 1 - 2)	Current	Current if applicable
Freq Limit Pwr x (x = 1 - 2)	Current	Current if applicable
CPU x VDD Temp (x = 1 - 2)	Not Applicable	Current if applicable

Removing and replacing covers on an 8335-GTB system

Learn how to remove and replace the covers for an IBM Power System S822LC (8335-GTB) system so that you can access the hardware parts or service the system.

Removing the service access cover from an 8335-GTB system

Learn how to remove the service access cover from an IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have removed both power supplies from the system. For instructions, see "Removing a power supply from the 8335-GTB" on page 209.

   (L005)

CAUTION: Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)

2. At the rear of the system, loosen the cover screw **(A)** that fastens the cover to the chassis.
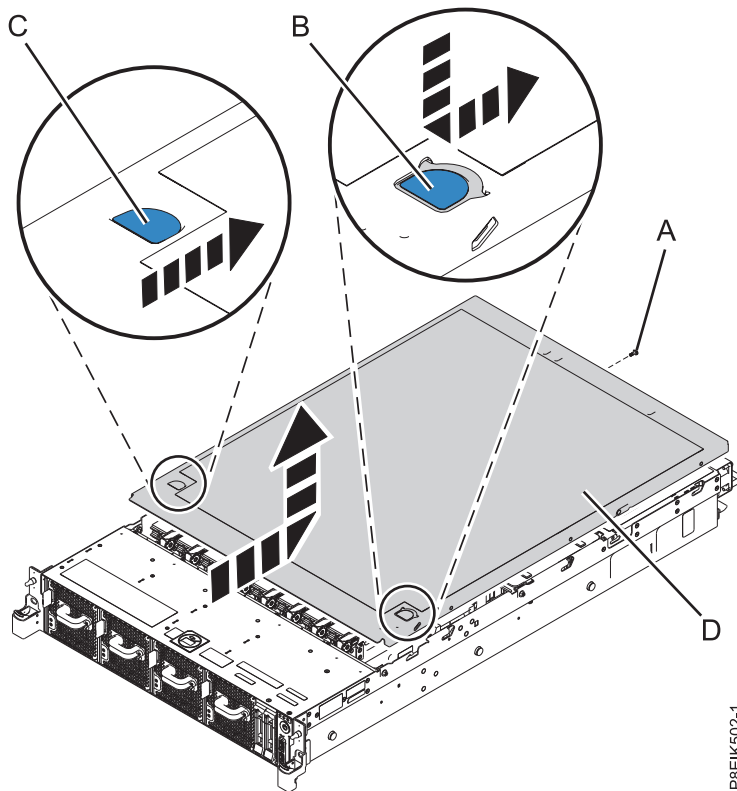
Figure 219. Removing the cover

3. While pressing down on latch **(B)** and touch point **(C)**, slide the cover **(D)** towards the rear 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, replace the cover before you power on the system.

Installing the service access cover on an 8335-GTB system

Learn how to install the service access cover on a rack-mounted IBM Power System S822LC (8335-GTB) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated prior to powering the system on.

Procedure

1. Place the cover **(A)** on the system unit such that the alignment pins on the cover are aligned to the slots on the chassis. Slide the cover to the front of the system until the blue release latch **(B)** locks in to place as shown in Figure 220 on page 204.
2. Fasten the cover screw **(C)** at the rear of the cover.
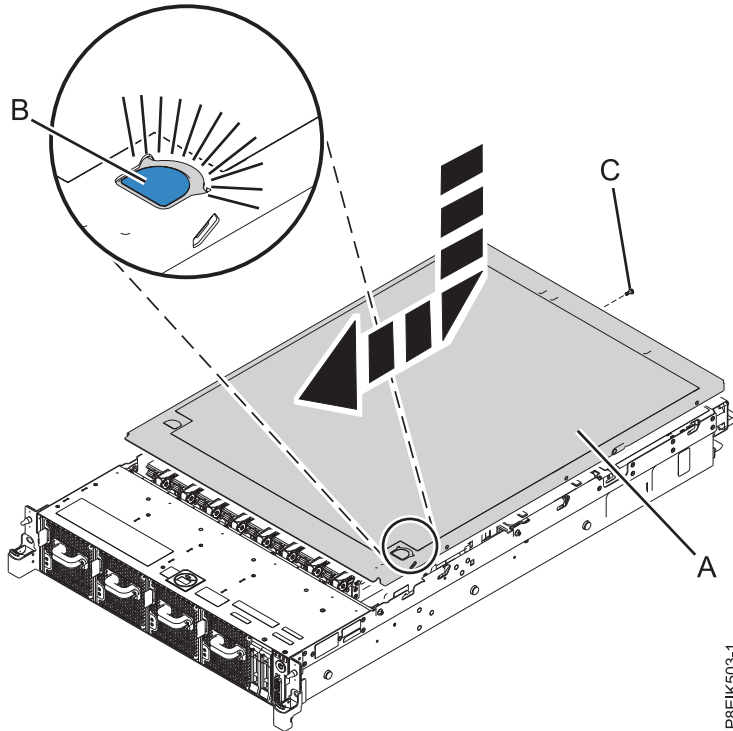
Figure 220. Installing the cover

Removing the front cover from an 8335-GTB system

Learn how to remove the cover from an IBM Power System S822LC (8335-GTB) system so that you can access the components or service the system.

Procedure

1. If necessary, open the front rack door.
2. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
3. If applicable, remove the screws that are on both sides of the cover to disengage the cover from the system unit.
4. Pull the cover away from the system.

Installing the front cover on an 8335-GTB system

Learn how to install the front cover on an IBM Power System S822LC (8335-GTB) system after you access the components or service the system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Position the cover on the front of the system unit so that the pins on the system match the holes at the rear of the cover.
3. Press the cover on to the system unit such that the pins engage with the holes and cover is firmly in place.
4. If applicable, replace the screws on each side of the cover to secure the system to the rack.
5. Close the front rack door.

Service and operating positions for 8335-GTB

Learn how to place on an IBM Power System S822LC (8335-GTB) system into the service or operating position.

Placing an 8335-GTB system into the service position

Learn how to place an IBM Power System S822LC (8335-GTB) system into the service position.

About this task

Pick the proper type of rails for your system:
- "Slide rails"
- "Fixed rails" on page 206

Slide rails

Use this procedure when your system is installed using slide rails.

Before you begin

Notes:
- When you place the system into the service position, you must ensure that all stability plates are firmly installed to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the system unit forward in the rack.
- When the slide rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

Procedure

1. Remove the screws on either side of the system that secure the system to the rack.
2. Push down the front latches **(A)** that secure the system unit to the rack.
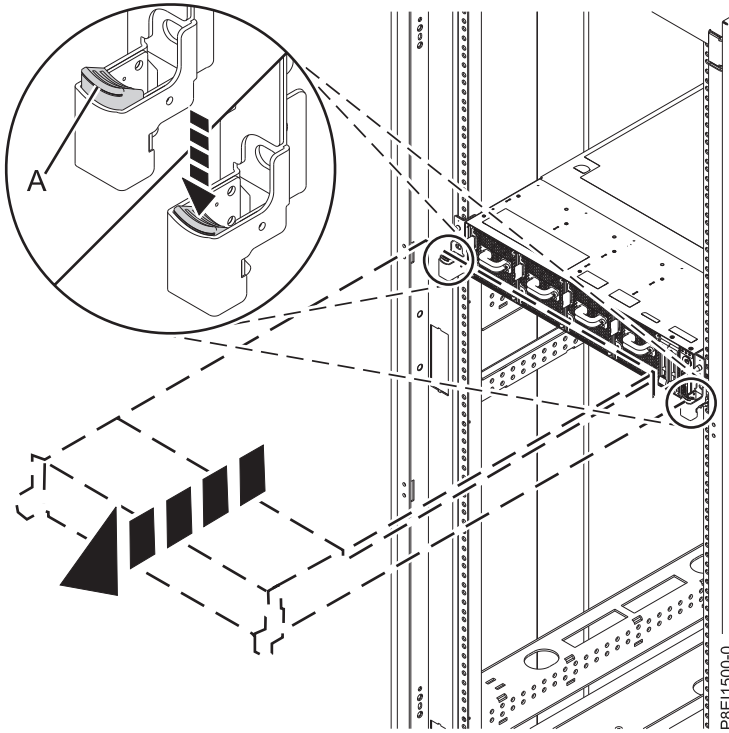
Figure 221. Placing the system into the service position

3. Pull the system unit out of the rack.

Fixed rails

Use this procedure when your system is installed using fixed rails.

Before you begin

CAUTION:
This system requires two people to remove the system from the rack. Do not begin this procedure unless physical assistance is available to remove the system from the rack.

Note: When you place the system into the service position, you must ensure that all stability plates are firmly installed to prevent the rack from toppling. Ensure that only one system unit is removed at a time.

Procedure

1. Label and disconnect the cables at the rear of the system unit.
2. For a water-cooled system, label and disconnect the water hoses at the manifold. Pull the coupling toward you to disconnect the water hoses as shown in Figure 222 on page 207.
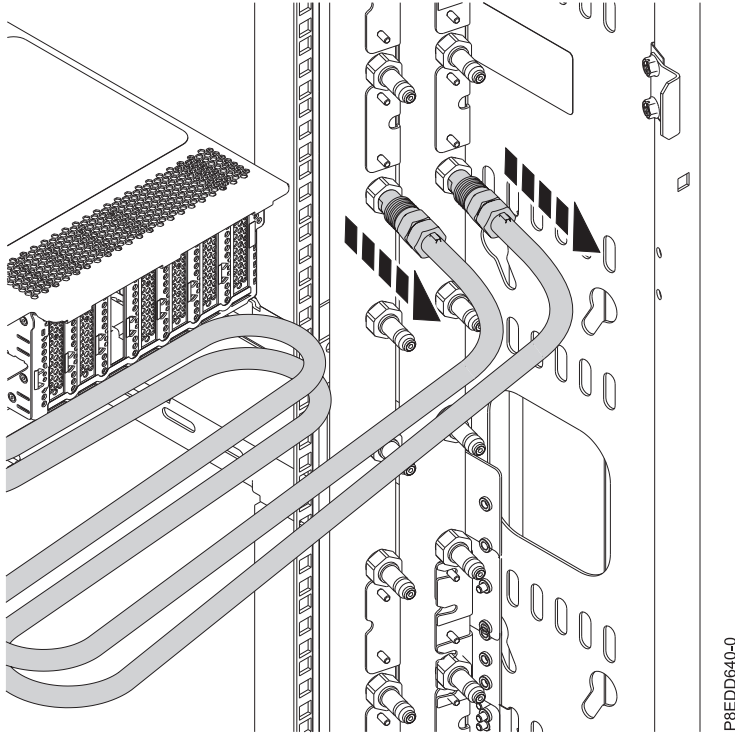
Figure 222. Disconnecting the water hoses

3. Remove the screws on either side of the system that secure the system to the rack.
4. While one person is supporting the weight of the front of the system, have the second person move to the rear of the system and push the system partially out of the rack.
5. Position one person on the left side of the system and one person on the right side of the system.
6. Tilt and lift the system from the rails.
7. Carefully set the system on a table with an appropriate ESD surface.

Placing an 8335-GTB system into the operating position

Learn how to place an IBM Power System S822LC (8335-GTB) system into the operating position.

About this task

Pick the proper type of rails for your system:
- "Slide rails"
- "Fixed rails" on page 208

Slide rails

Use this procedure when your system is installed using slide rails.

Before you begin

When you place the system in the operating position, ensure that the cables at the rear of the system do not catch or bind as you push the system unit back into the rack.

Procedure

1. Unlock the blue rail safety latches **(A)** by lifting them upward.

2. Align the system unit on to the rails and push the system unit back into the rack until both release latches lock into position. See Figure 223.
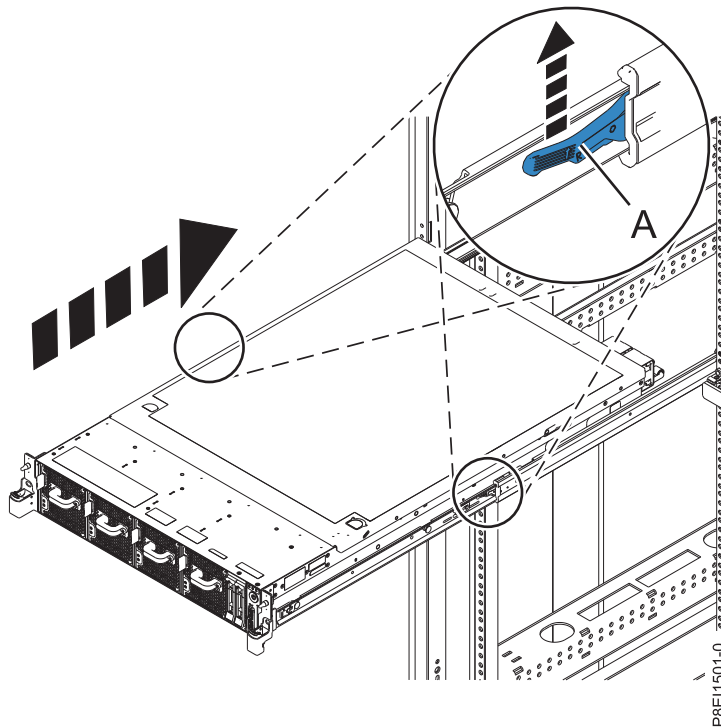
Figure 223. Placing the system into the operating position

3. Replace the screws on either side of the system that secure the system to the rack.

Fixed rails

Use this procedure when your system is installed using fixed rails.

Before you begin

CAUTION:
This system requires two people to replace the system into the rack. Do not begin this procedure unless physical assistance is available to replace the system into the rack.

Note: When you place the system into the operating position, you must ensure that all stability plates are firmly installed to prevent the rack from toppling. Ensure that only one system unit is replaced at a time.

Procedure

1. Position one person on the left side of the system and one person on the right side of the system.
2. Lift the system.
3. Tilt the system into position over the fixed rack rails.
4. Carefully lower the system until the rear of the system rests on the rails.
5. While one person is supporting the weight of the system, have the second person move to the front of the system and push the system all the way into the rack.
6. Using your labels, reconnect the cables at the rear of the system unit.
7. For a water-cooled system, connect the water hoses at the rear of the rack to the manifold, as shown in Figure 224 on page 209. Ensure that you plug the male hose into the female manifold plug, and plug the female hose into the male manifold plug.

Attention: Before powering on the system, ensure that cooling water is circulating through the system.
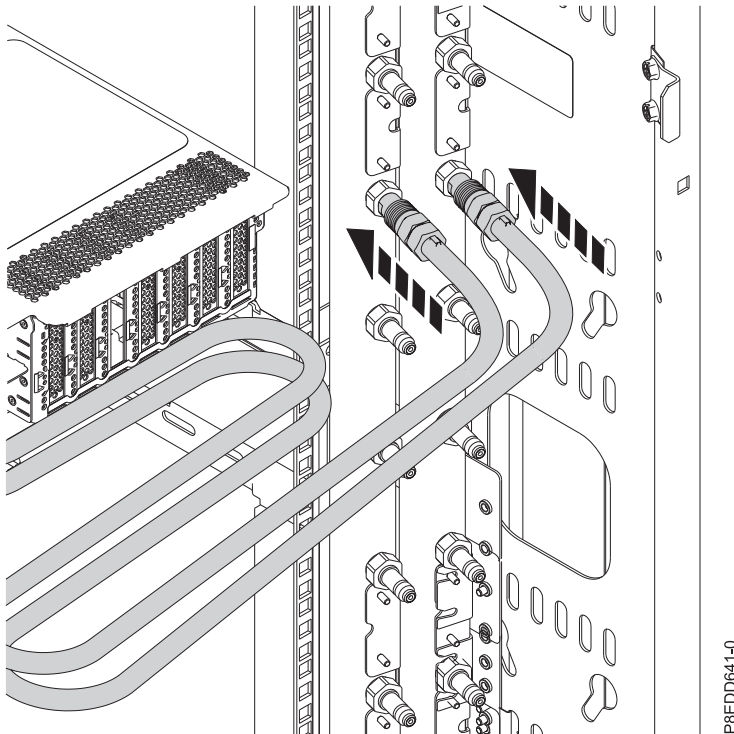
Figure 224. Connecting the water hoses

8. Replace the screws on either side of the system that secure the system to the rack.

Removing and replacing a power supply in the 8335-GTB

Find information about removing and replacing power supplies in the IBM Power System S822LC (8335-GTB) system.

Removing a power supply from the 8335-GTB

Find information about removing power supplies in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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. Stop the system. For instructions, see "Stopping the 8335-GTB system" on page 199.

3. Label and remove the power cord from the power supply to remove. For instructions, see "Disconnecting the power cords from an 8335-GTB system" on page 211.
4. Remove the power supply from the system.
   a. To unseat the power supply from its position in the system, pull up the terracotta locking-tab **(A)**. See Figure 225.
   b. Grasp the power supply handle with one hand, and pull the power supply **(B)** part of the way out of the system.
   c. Place your other hand underneath the power supply and pull the power supply out of the system and place it on an ESD mat.
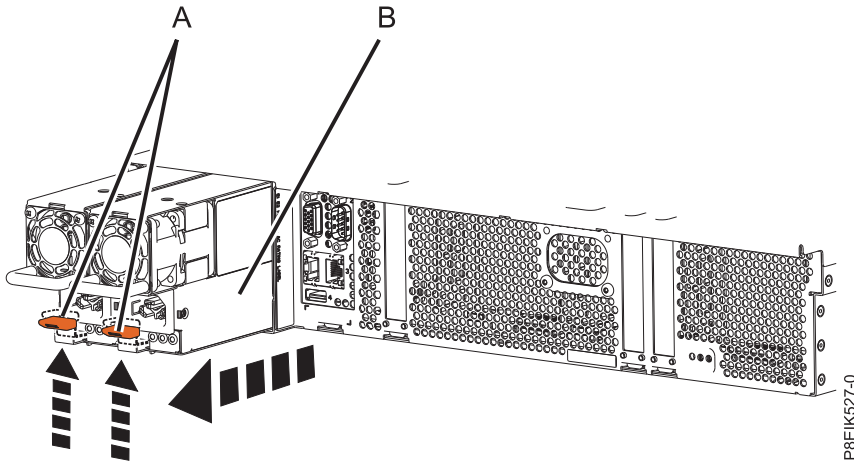
Figure 225. Removing a power supply from the system

Replacing a power supply in the 8335-GTB

Find information about replacing power supplies in the IBM Power System S822LC (8335-GTB) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Align the power supply **(A)** with the bay and slide the power supply into the system until the terracotta latch **(B)** locks in place. See Figure 226.
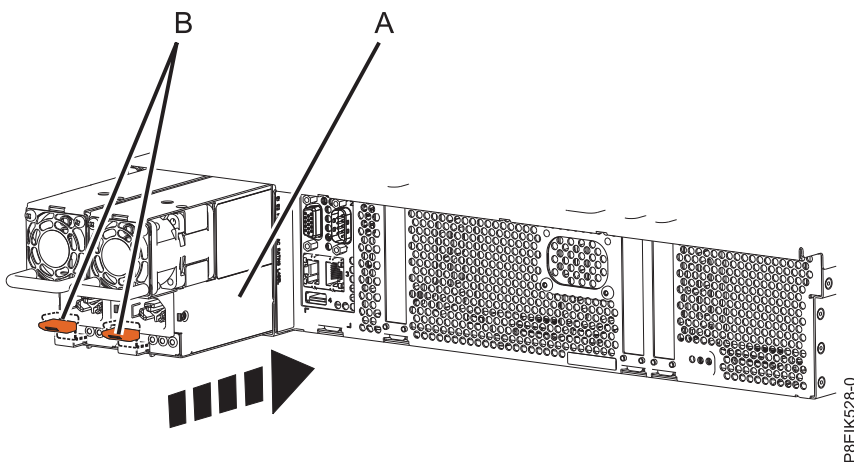
Figure 226. Replacing a power supply in the system

3. Reconnect the power cord. For instructions, see "Connecting the power cords to an 8335-GTB system" on page 213.
4. Start the system. For instructions, see "Starting the 8335-GTB system" on page 199.

Power cords

Learn how to disconnect and connect the power cords in an IBM Power System S822LC (8335-GTB) system.

Disconnecting the power cords from an 8335-GTB system

Learn how to disconnect the power cords from an IBM Power System S822LC (8335-GTB) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.
2. Identify the system unit that you are servicing in the rack.
3. Label and disconnect the power cords from the power supply handle. Unfasten the hook-and-loop fastener that ties the power cord to the power supply handle. Note how the power is looped; you will need to make that same loop when you reattach the power cords. You use two types of loops, detailed in Figure 227 and Figure 228 on page 212.
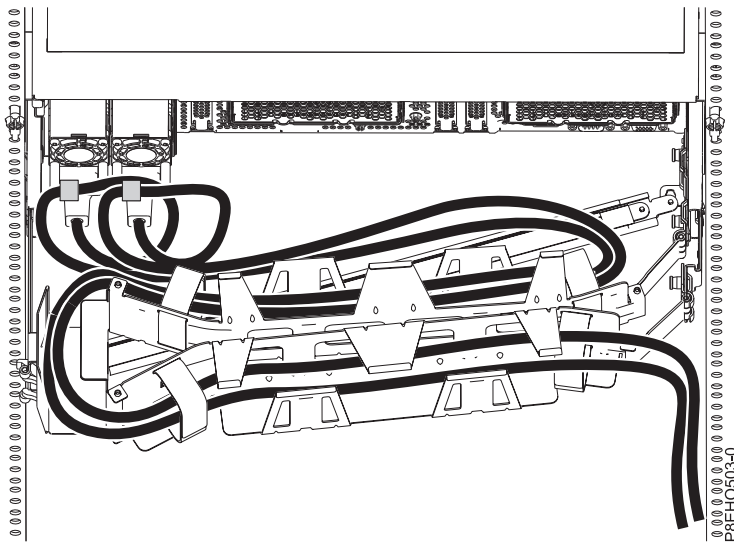
Figure 227. Power cord loop with cable management arm routing. The power cord loops counterclockwise to the right.
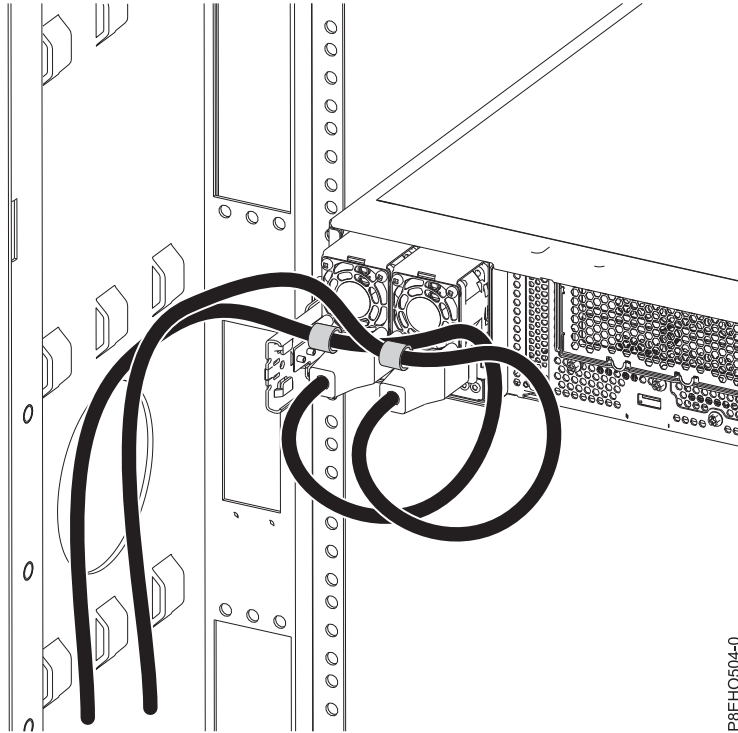
Figure 228. Power cord loop with sidewall routing. The power cord loops counterclockwise to the left.

4. Disconnect the power cords from the system unit. See figure Figure 229.

   Note: This system might be equipped with two or more power supplies. If the removing and replacing procedures require the power to be off, then ensure that all the power sources to the system are disconnected.
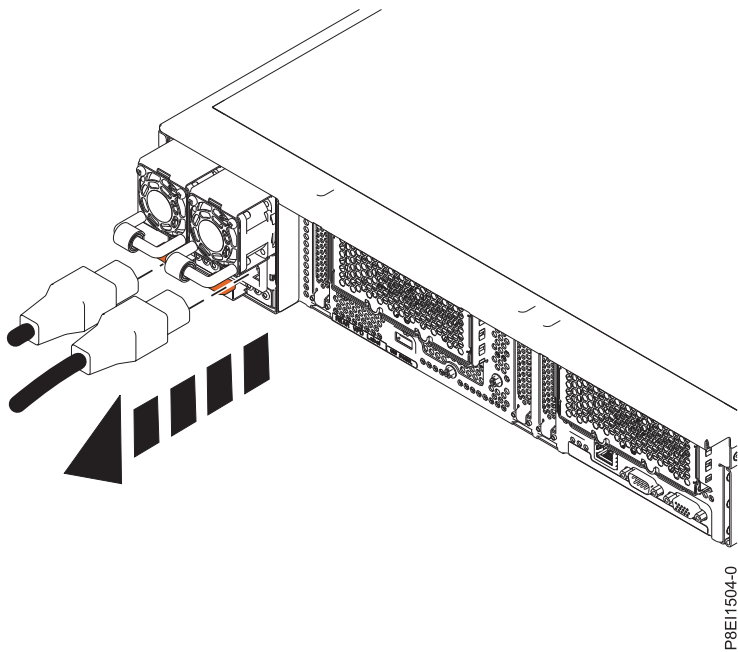
Figure 229. Removing the power cords from the system

Connecting the power cords to an 8335-GTB system

Learn how to connect the power cords to an IBM Power System S822LC (8335-GTB) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.
2. Using your labels, reconnect the power cords to the system unit. See figure Figure 230.
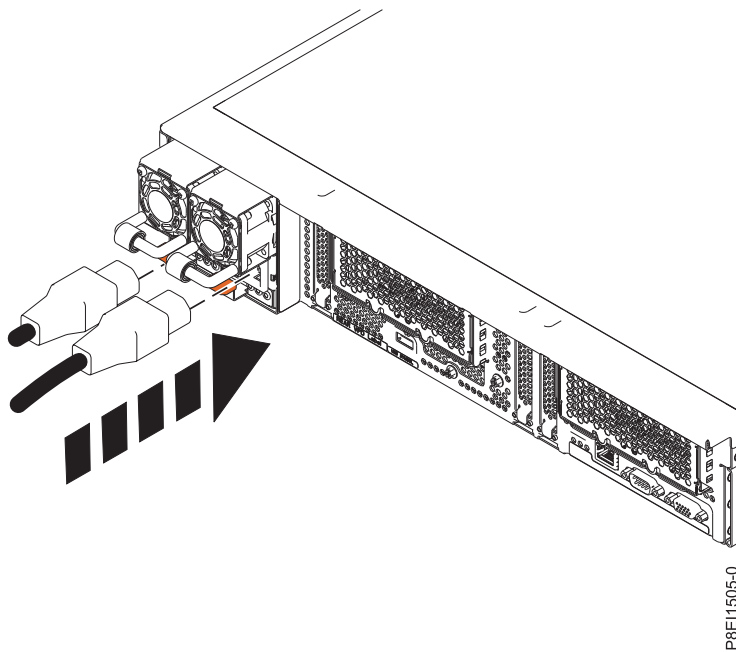
Figure 230. Connecting the power cords to the system

3. Loop and attach the power cords to the power supply handle. Note how the power is looped; be sure to maintain at least a 5 cm (2 in.) diameter loop. You use two types of loops, detailed in Figure 231 on page 214 and Figure 232 on page 214. Use the hook-and-loop fastener to tie the power cord to the power supply handle.
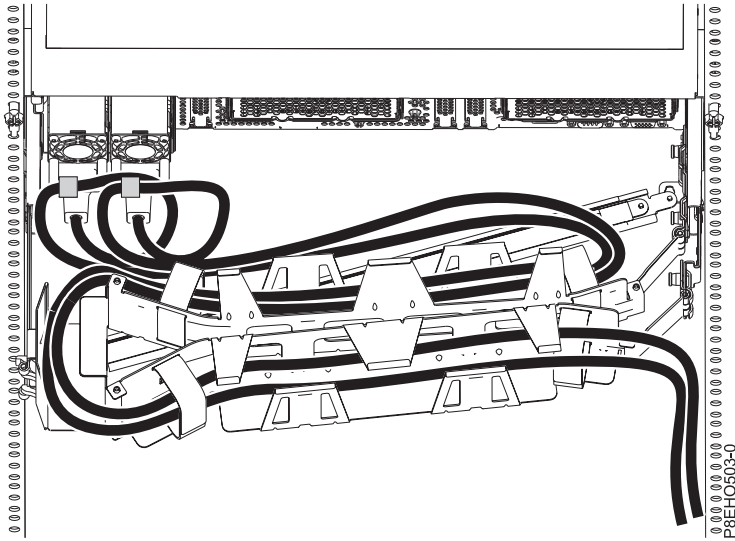
Figure 231. Power cord loop with cable management arm routing. The power cord loops counterclockwise to the right.
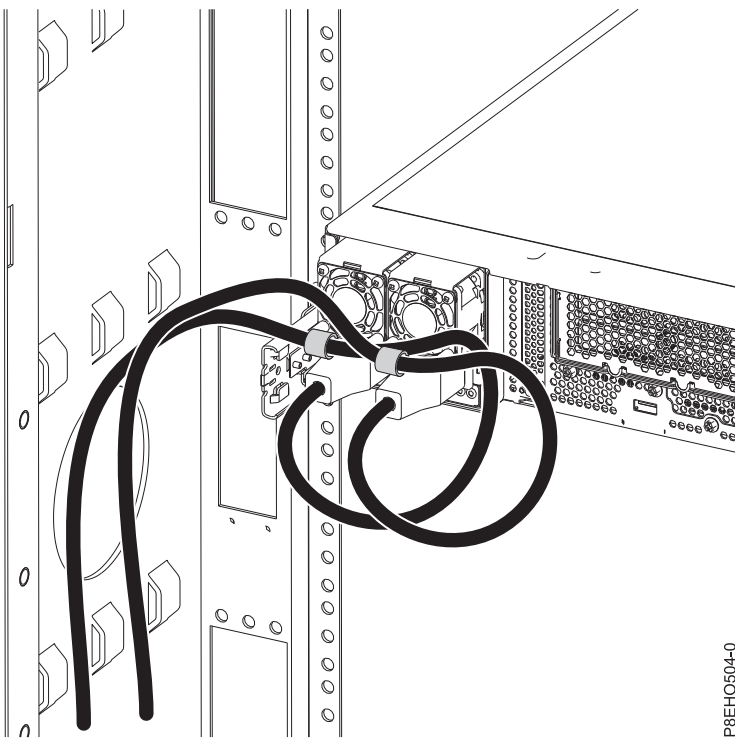
Figure 232. Power cord loop with sidewall routing. The power cord loops counterclockwise to the left.

4. Close the rack door at the rear of the system.

Notices

This information was developed for products and services offered in the US.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
US

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

The performance data and client examples cited are presented for illustrative purposes only. Actual performance results may vary depending on specific configurations and operating conditions.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

The drawings and specifications contained herein shall not be reproduced in whole or in part without the written permission of IBM.

IBM has prepared this information for use with the specific machines indicated. IBM makes no representations that it is suitable for any other purpose.

IBM's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check IBM's support websites for updated information and fixes applicable to the system and related software.

Homologation statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Accessibility features for IBM Power Systems servers

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

Overview

The IBM Power Systems servers include the following major accessibility features:
* Keyboard-only operation
* Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 (www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (www.access-board.gov/guidelines-and-standards/ communications-and-it/about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the Accessibility section of the IBM Knowledge Center help (www.ibm.com/support/knowledgecenter/doc/ kc_help.html#accessibility).

Keyboard navigation

This product uses standard navigation keys.

Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

Vendor software

The IBM Power Systems servers include certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for accessibility information about its products.

Related accessibility information

In addition to standard IBM help desk and support websites, IBM has a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service
800-IBM-3383 (800-426-3383)
(within North America)

For more information about the commitment that IBM has to accessibility, see IBM Accessibility (www.ibm.com/able).

Privacy policy considerations

IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user, or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below.

This Software Offering does not use cookies or other technologies to collect personally identifiable information.

If the configurations deployed for this Software Offering provide you as the customer the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent.

For more information about the use of various technologies, including cookies, for these purposes, see IBM's Privacy Policy at http://www.ibm.com/privacy and IBM's Online Privacy Statement at http://www.ibm.com/privacy/details the section entitled "Cookies, Web Beacons and Other Technologies" and the "IBM Software Products and Software-as-a-Service Privacy Statement" at http://www.ibm.com/software/info/product-privacy.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at Copyright and trademark information at www.ibm.com/legal/copytrade.shtml.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

Electronic emission notices

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER8 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

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

CAN ICES-3 (A)/NMB-3(A)

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU 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.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
email: halloibm@de.ibm.com

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

VCCI Statement - Japan

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。　　　　　　　　　　　　　　　　　　VCCI－A

The following is a summary of the VCCI Japanese statement in the box above:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値： Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
・回路分類　：6（単相、ＰＦＣ回路付）
・換算係数　：0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
・回路分類　：5（3相、ＰＦＣ回路付）
・換算係数　：0

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

声　明

此为 A 级产品,在生活环境中、该产品可能会造成无线电干扰。在这种情况下,可能需要用户对其干扰采取切实可行的措施。

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

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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

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

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서
가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022 / EN 55032 Klasse A ein.

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

EN 55022 / EN 55032 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road

Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

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

Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC)
Class B in the feature installation information.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device,
pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against
harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in
accordance with the instructions, may cause harmful interference to radio communications. However,
there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be
determined by turning the equipment off and on, the user is encouraged to try to correct the interference
by one or more of the following measures:

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

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

CAN ICES-3 (B)/NMB-3(B)

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU 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.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
email: halloibm@de.ibm.com

VCCI Statement - Japan

　この装置は，クラスB情報技術装置です。この装置は，家庭環境で使用することを目的としていますが，この装置がラジオやテレビジョン受信機に近接して使用されると，受信障害を引き起こすことがあります。
　取扱説明書に従って正しい取り扱いをして下さい。　　　　ＶＣＣＩ－Ｂ

Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値： Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
• 回路分類 ： 6（単相、ＰＦＣ回路付）
• 換算係数 ： 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
• 回路分類 ： 5（3相、ＰＦＣ回路付）
• 換算係数 ： 0

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

Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

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

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022/ EN 55032 Klasse B.

Terms and conditions

Permissions for the use of these publications are granted subject to the following terms and conditions.

Applicability: These terms and conditions are in addition to any terms of use for the IBM website.

Personal Use: You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of IBM.

Commercial Use: You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

Rights: Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.