

Power Systems

*Servicing the IBM Power System AC922
(8335-GTX)*



Note

Before using this information and the product it supports, read the information in “[Safety notices](#)” on page v, “[Notices](#)” on page 241, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM® Power Systems servers that contain the POWER9™ processor and to all associated models.

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Contents

Safety notices.....	v
Removing and replacing parts in the 8335-GTX system.....	1
BMC card.....	2
Removing the BMC card.....	2
Replacing the BMC card.....	4
Cold plates.....	7
Removing the cold plates from the system.....	8
Replacing the cold plates in the cold plate installation carrier.....	32
Replacing the cold plates in the system.....	45
Disk drive.....	64
Removing a disk drive.....	65
Replacing a disk drive.....	67
Disk drive and fan card.....	68
Removing the disk drive and fan card.....	68
Replacing the disk drive and fan card.....	74
Disk and fan signal cable.....	80
Removing the disk and fan signal cable.....	81
Replacing the disk and fan signal cable.....	83
Fans.....	84
Removing a fan.....	84
Replacing a fan.....	86
Fan power cable.....	87
Removing the fan power cable.....	87
Replacing the fan power cable.....	90
Graphics processing unit.....	91
Removing the graphics processing unit from a water-cooled system.....	91
Replacing the graphics processing unit in a water-cooled system.....	96
Memory modules.....	101
Removing and replacing memory modules.....	102
Memory plugging rules.....	107
PCIe adapters.....	108
Removing a PCIe adapter.....	108
Replacing a PCIe adapter.....	109
Power supplies.....	110
Removing a power supply.....	111
Replacing a power supply.....	114
Power switch and cable.....	115
Removing the power switch and cable.....	115
Replacing the power switch and cable.....	121
System backplane.....	125
Preparing to remove the system backplane.....	125
Removing the system backplane.....	126
Replacing the system backplane.....	137
Preparing the system for operation after replacing the system backplane.....	153
System processor module.....	153
Removing a system processor module.....	154
Replacing the system processor module.....	164
Upgrading system processor modules.....	176
Time-of-day battery.....	177

Trusted platform module.....	179
Removing the trusted platform module.....	180
Replacing the trusted platform module.....	181
USB cable and connector.....	182
Removing the USB cable and connector.....	182
Replacing the USB cable and connector.....	189
Water manifold.....	193
Preparing the system to remove and replace the water manifold.....	193
Removing the water manifold.....	197
Replacing the water manifold.....	201
Preparing the system for operation after replacing the water manifold.....	205
Common procedures for servicing or installing features.....	209
Before you begin.....	209
Identifying the system that contains the part to replace.....	213
System LEDs.....	213
Identifying the system.....	215
Preparing the system to remove and replace internal parts.....	216
Preparing the system for operation.....	220
Starting and stopping the system.....	222
Starting the system	222
Stopping the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system.....	223
Sensor status.....	224
Removing and replacing covers.....	224
Removing the service access cover.....	224
Installing the service access cover.....	225
Removing the front cover.....	226
Installing the front cover.....	227
Service and operating positions.....	227
Placing the system into the service position.....	227
Placing the system into the operating position.....	229
Removing and replacing power cords.....	232
Disconnecting power cords.....	232
Connecting power cords.....	235
Updating the system firmware level of a BMC card to OP940.20, or later, in an 8335-GTH or 8335-GTX system.....	237
Notices.....	241
Accessibility features for IBM Power Systems servers.....	242
Privacy policy considerations	243
Trademarks.....	243
Electronic emission notices.....	244
Class A Notices.....	244
Class B Notices.....	247
Terms and conditions.....	249

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.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. 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.
- 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 if provided, unless the earthquake option is to be installed.
- 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).



- Stability hazard:
 - The rack may tip over causing serious personal injury.
 - Before extending the rack to the installation position, read the installation instructions.
 - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
 - Do not leave the slide-rail mounted equipment in the installation position.
- 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 1 of 2)

(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 or if the rack is not bolted to the floor. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)



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 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 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 2083 mm (30 x 82 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 or in an earthquake environment bolt the rack to the floor.
 - 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)



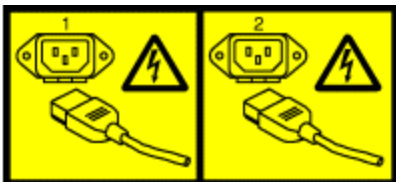
DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- The rack may tip over causing serious personal injury.

- Before extending the rack to the installation position, read the installation instructions.
- Do not put any load on the slide-rail mounted equipment mounted in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.

(L002)

(L003)



or



or

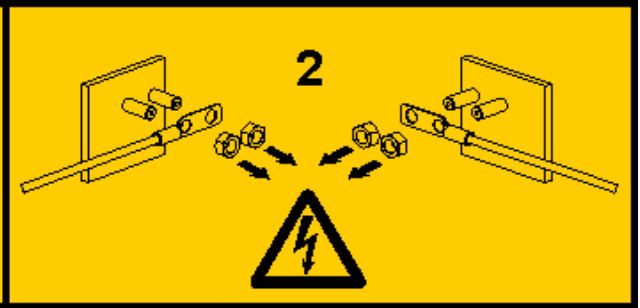
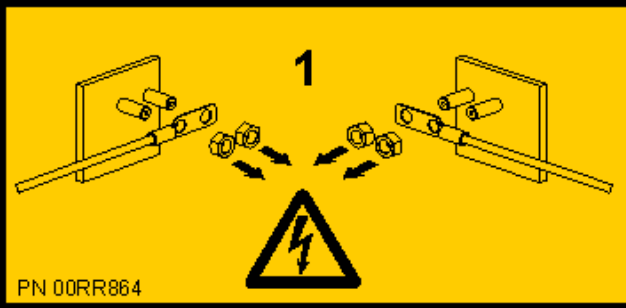


or



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 may 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)

(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 degrees C (212 degrees 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 raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- 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 platforms, tilt riser, angled unit install wedge or other such accessory options. Secure such platforms -- riser tilt, wedge, etc options to main lift shelf or forks in all four

(4x or all other provisioned mounting) 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 [adjustable angling platform] option flat at all times except for final minor angle 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 (unless the specific allowance is provided for one following qualified procedures for working at elevations with this 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.
- This TOOL must be maintained correctly for IBM Service personnel to use it. IBM shall inspect condition and verify maintenance history before operation. Personnel reserve the right not to use TOOL if inadequate. (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 8335-GTX system

Use these procedures to remove and replace failing parts.

Note: See the [International Information Bulletin for Customers - Installation of IBM Machines](http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss) (<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 **blue** on the part indicates a touch point.
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.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. 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.
- 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 BMC card in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX

Learn how to remove and replace the baseboard management card (BMC) in the IBM Power® System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Removing the BMC card from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove a the baseboard management card (BMC), complete the steps in this procedure.

Before you begin

Record the network settings. For instructions, see [Network settings \(www.ibm.com/support/knowledgecenter/POWER9/p9eih/p9eih_openbmc_networksetting.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9eih/p9eih_openbmc_networksetting.htm).

Power off the system and place it in the service position. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. If needed, label and remove the cables from the BMC card.
 3. To remove the BMC card, follow these steps as shown in [Figure 1 on page 4](#).
 - a) Remove the four screws that secure the rear of the card to the chassis at **(A)**.
 - b) Slide the release latch at **(B)** away from the BMC card, then rotate the latch towards the front of the system to release and lift the BMC card from the system backplane.
 - c) Using the blue tab at **(C)** and the handle **(B)**, lift the BMC card out of the chassis.

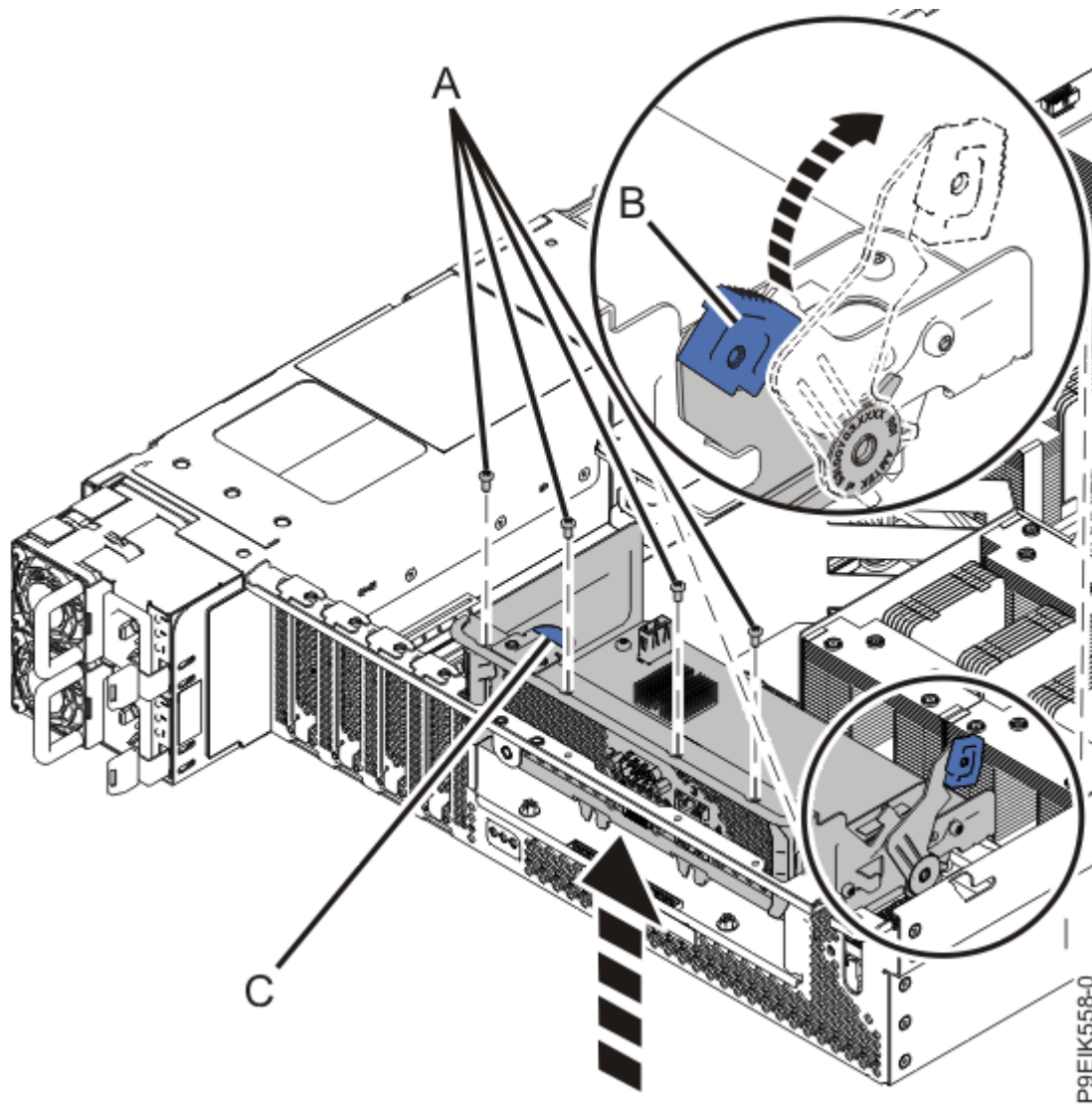


Figure 1. Removing the BMC card

4. Place the BMC card on an ESD mat.

Replacing the BMC card in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace a the baseboard management card (BMC), complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Ensure that the release latch of the BMC card is opened to about a 60-degree angle .
3. Align the BMC card with the rear of the system.

Use the plastic guides at **(A)** and the alignment pin **(B)** shown in [Figure 2 on page 5](#) to help align the card to the chassis.

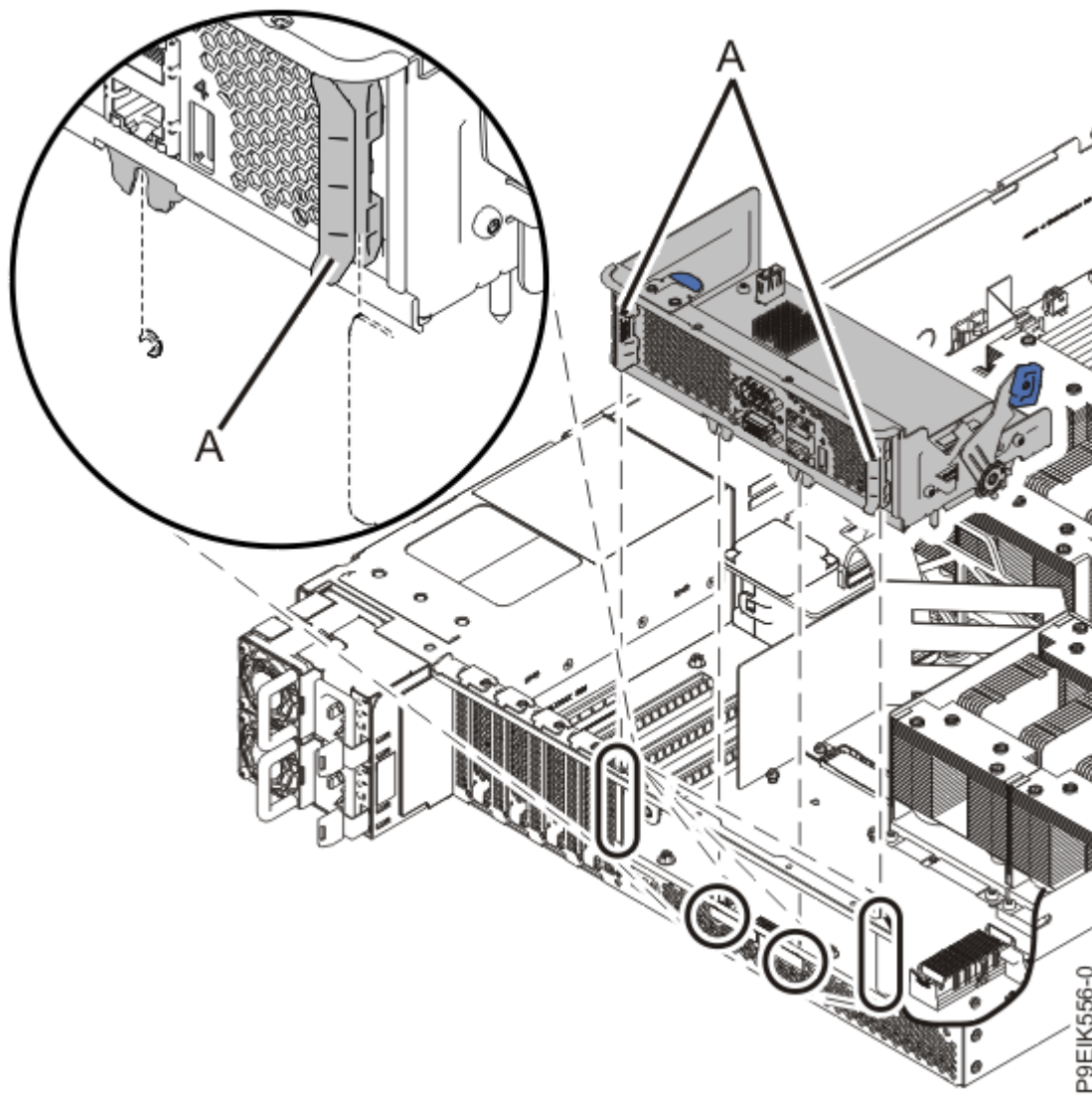


Figure 2. Aligning the BMC card in the chassis

4. Using the blue tab at **(A)** and the handle **(B)** as shown in [Figure 3 on page 6](#), press the BMC card into the connector on the system backplane.

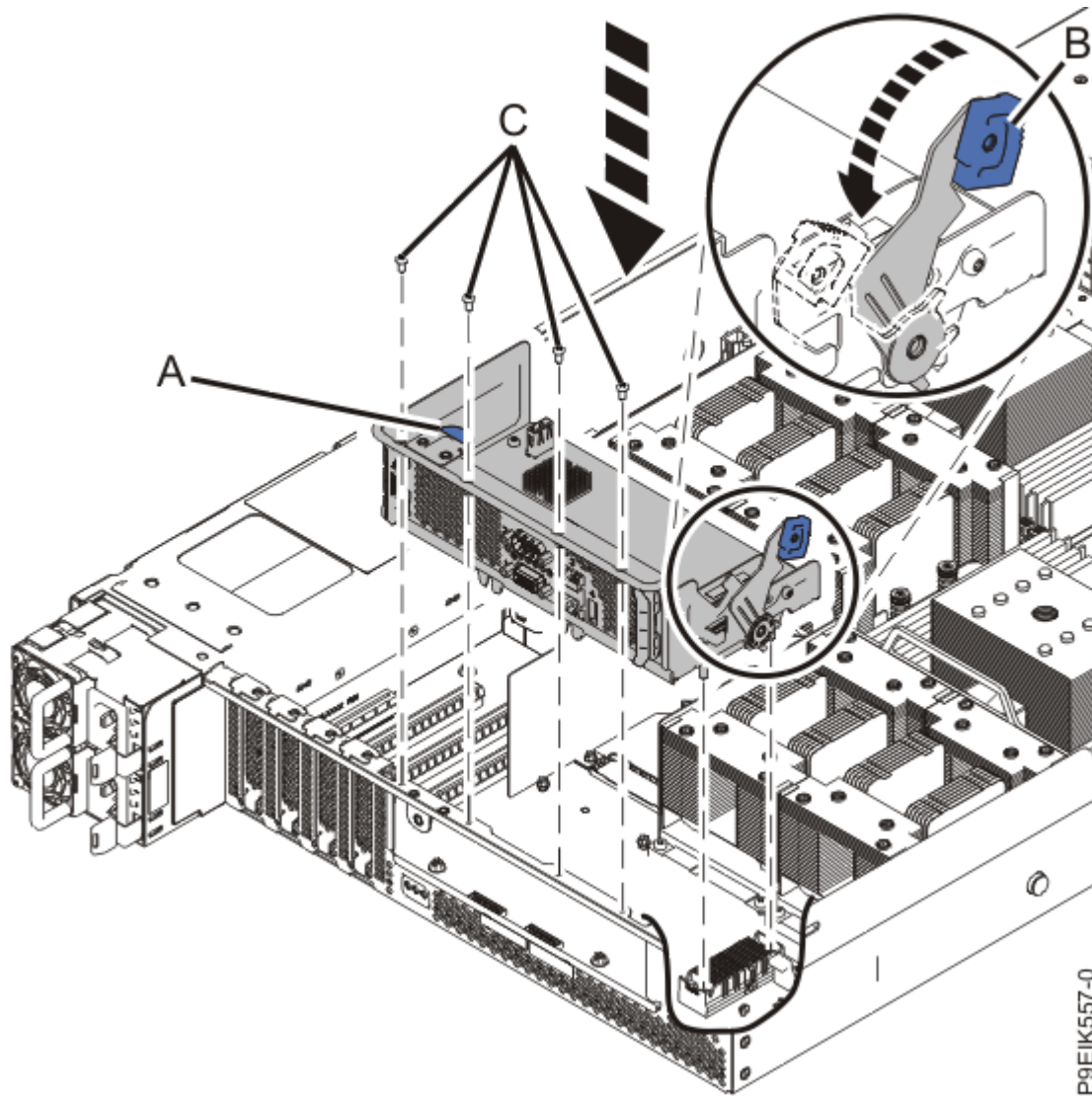


Figure 3. Replacing the BMC card

5. Rotate the release latch **(B)** towards the rear of the system and snap the latch into the closed position to fully seat the card.
6. Replace the four screws **(C)** to secure the BMC card to the rear of the chassis.
7. If needed, use your labels to replace the cables in the BMC card.
8. Apply the new MAC address label over the previous label, on the power supply housing of the chassis, as shown in [Figure 4](#) on page 7.

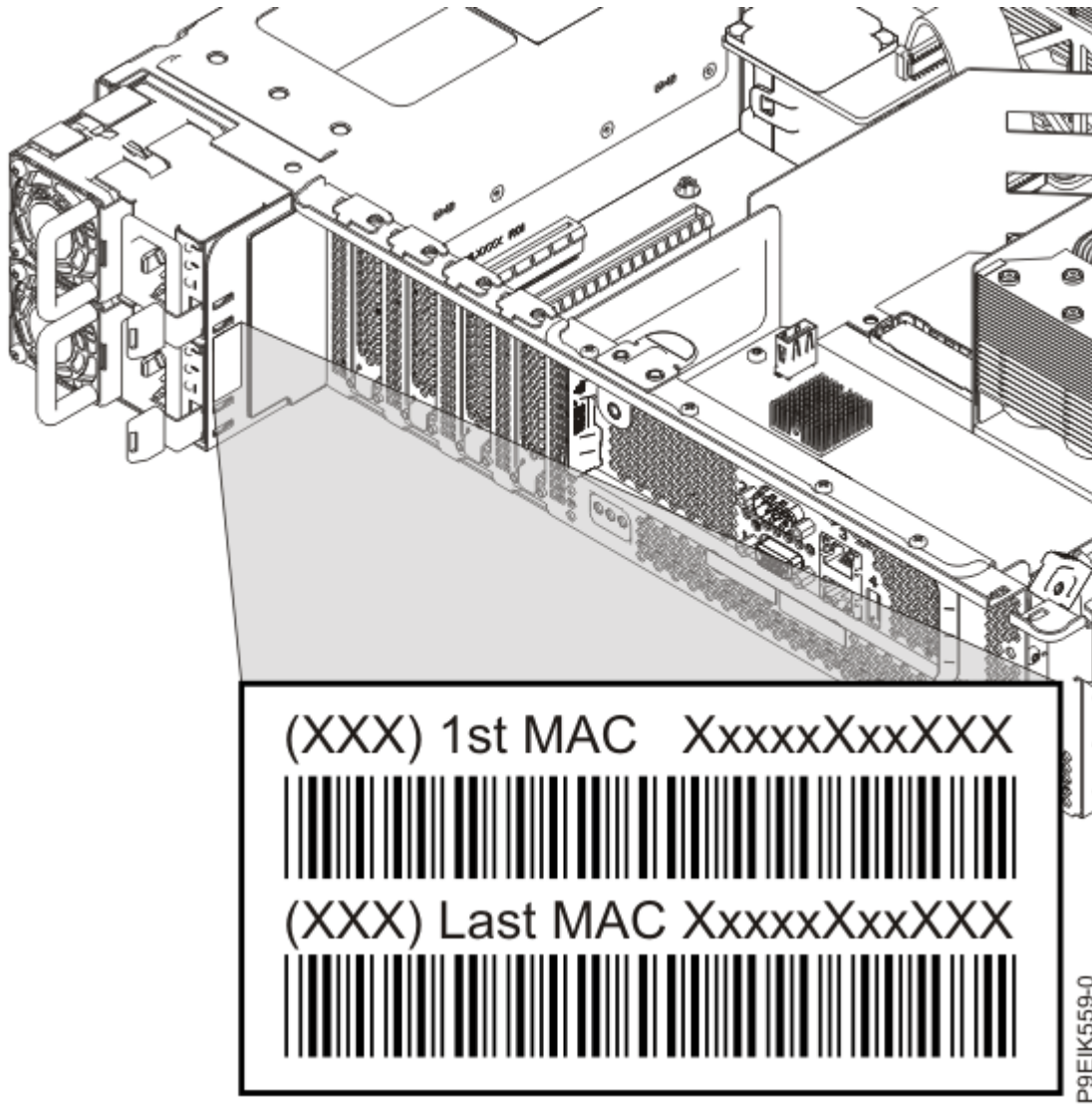


Figure 4. Applying the new MAC address label

9. If the system is an 8335-GTH or 8335-GTX and the system firmware level is OP940.20, or later, go to [“Updating the system firmware level of a BMC card to OP940.20, or later, in an 8335-GTH or 8335-GTX system”](#) on page 237.

What to do next

Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

Removing and replacing the cold plates in the 8335-GTW or 8335-GTX

Learn how to remove and replace the cold plates in the system.

Removing the cold plates from the 8335-GTW or 8335-GTX system

To remove the cold plates, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

As part of the cold plate replacement, the cold plates are removed from the system processor modules and GPUs. Each module and GPU must have thermal interface material (TIM) between the module, the GPU, and the cold plate. If the processor TIM is damaged, it must be replaced. GPU TIMs must always be replaced. Ensure that you have spare TIMs available before proceeding.

Familiarize yourself with the cold plate installation carrier. You use the carrier to remove and replace the cold plate assembly. The installation carrier is a metal frame that fits over the system.

- Each processor cold plate & GPU cold plate has a corresponding holder in the installation carrier.
- Each holder has holes and plastic latches to secure the pins on the top of each cold plate. Slide the holder near to the top of the pins; the pins are narrower at the top.
- Each holder has a quarter turn screw that can be loosened to remove the holder from the carrier. This helps when you need to install or remove the cold plate from the carrier.
- The holder also has alignment pins to help you replace the holder in the carrier.
- The carrier has hook-and-loop fasteners to hold the water pipes and hoses.

Procedure

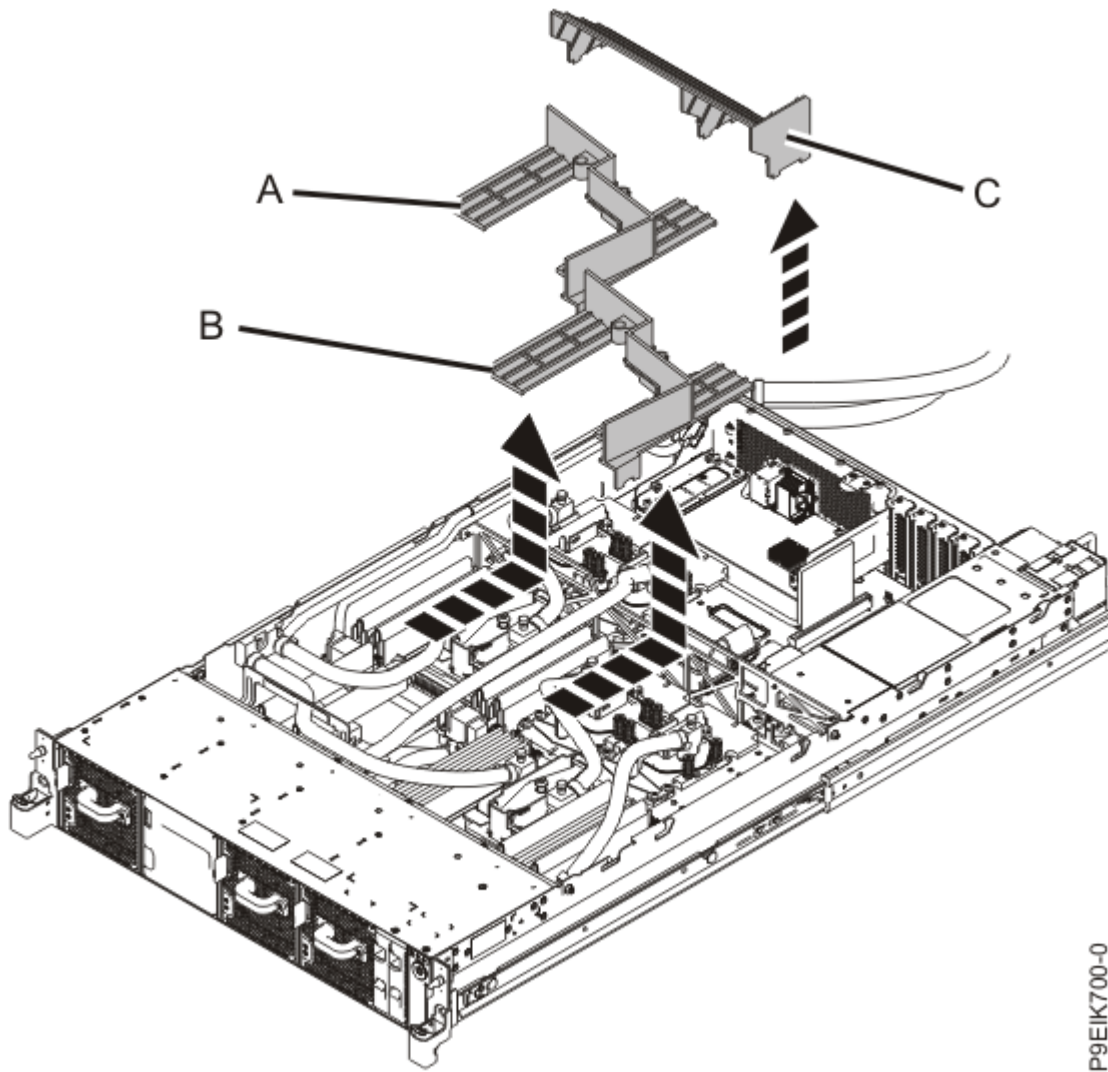
1. Attach the electrostatic discharge (ESD) wrist strap.

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



Attention:

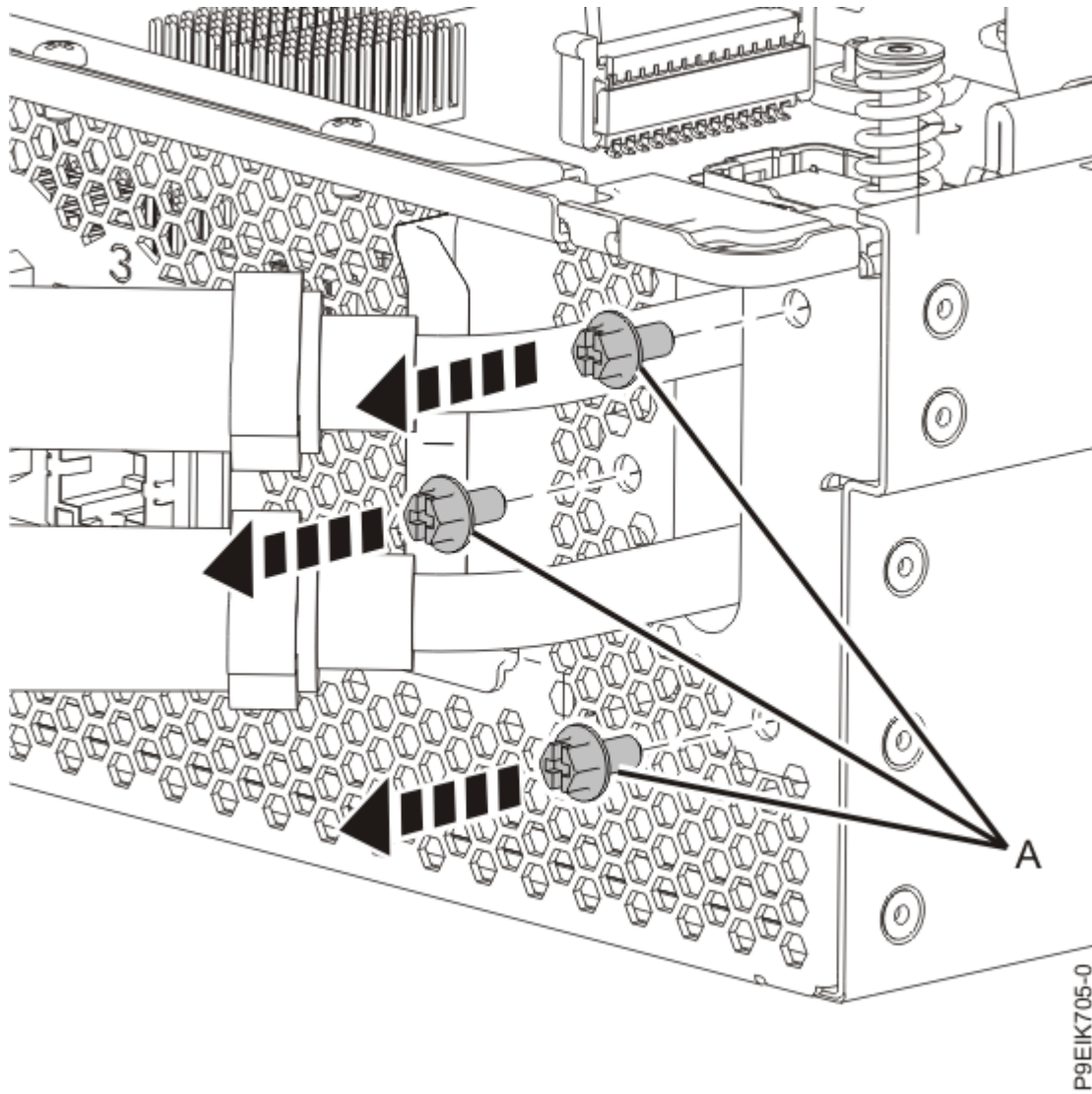
- Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD 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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Remove the air baffles **(A)**, **(B)**, and **(C)** as shown in [Figure 5 on page 9](#).
They lift straight up; you might need to maneuver them around the hoses.



P9EIK700-0

Figure 5. Removing the air baffles

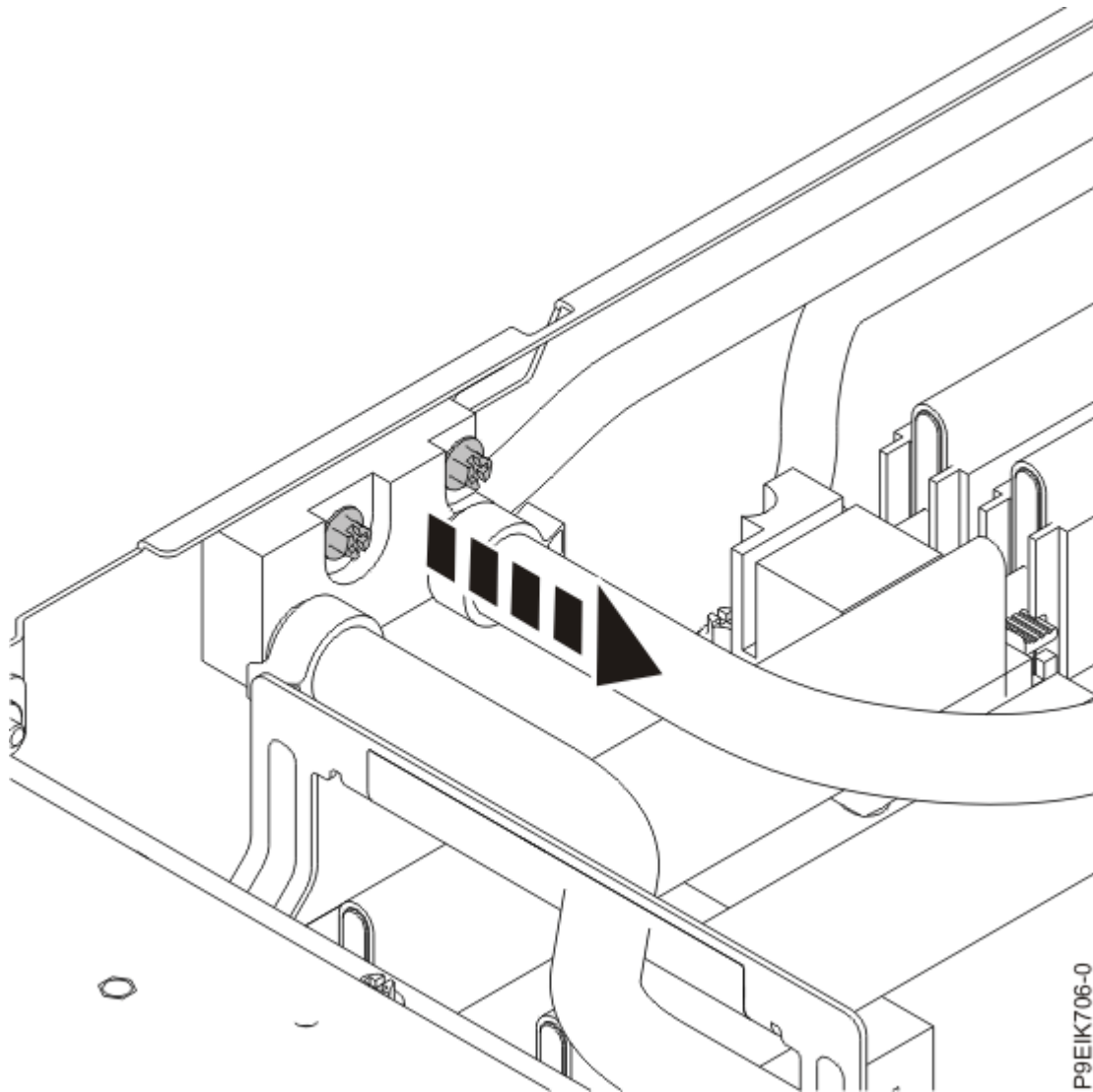
3. Remove the three screws **(A)** that secure the water hoses to the rear of the system as shown in [Figure 6](#) on page 10.



P9EIK705-0

Figure 6. Removing the rear water hose screws

4. Remove the two screws that secure the pipes to the left side of the chassis as shown in [Figure 7](#) on [page 11](#).



P9EIK706-0

Figure 7. Removing the screws from the side water pipe bracket

5. Remove the two pipe holders **(A)** near the middle of the system as shown in [Figure 8](#) on page 12. Loosen the four screws **(B)** and lift the holders off the pipes.

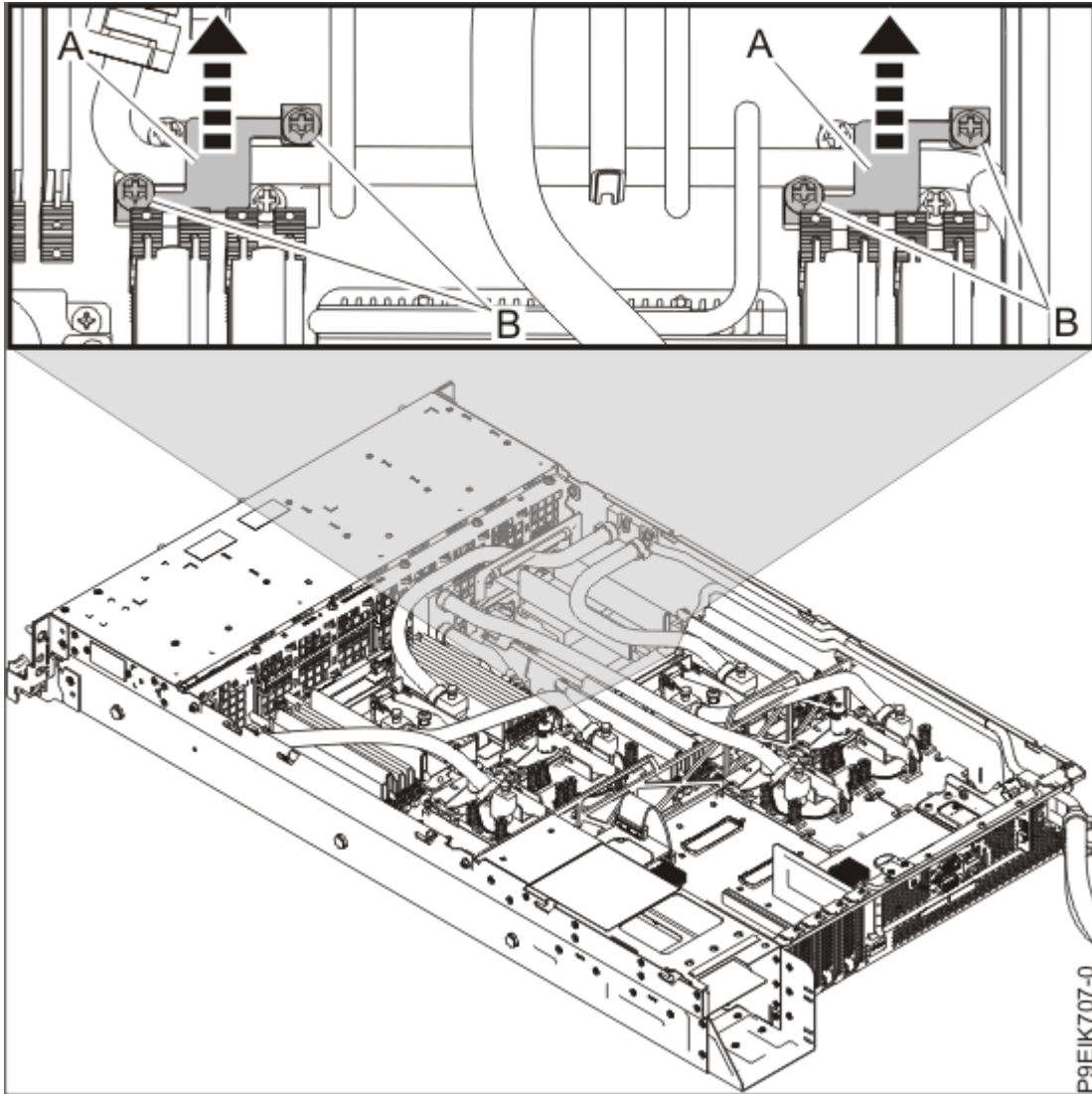


Figure 8. Removing the pipe holders

6. Remove the two pipe holders **(A)** near the front of the system as shown in [Figure 9 on page 13](#). Loosen the four screws **(B)** and lift the holders from the pipes.

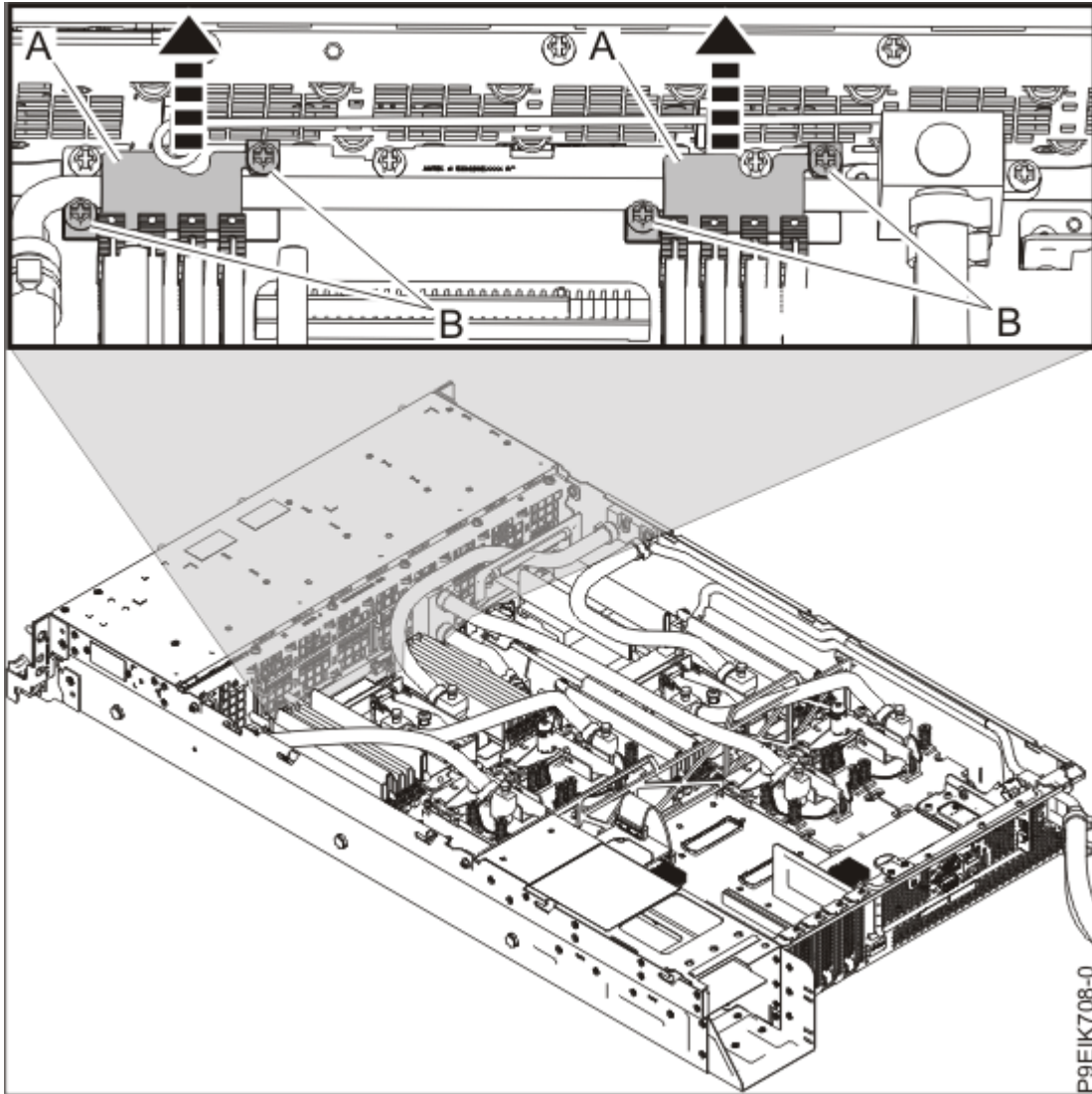


Figure 9. Removing the pipe holders

7. Loosen the screw **(A)** that secures the pipe junction **(B)** to the front of the system as shown in [Figure 10](#) on page 14.

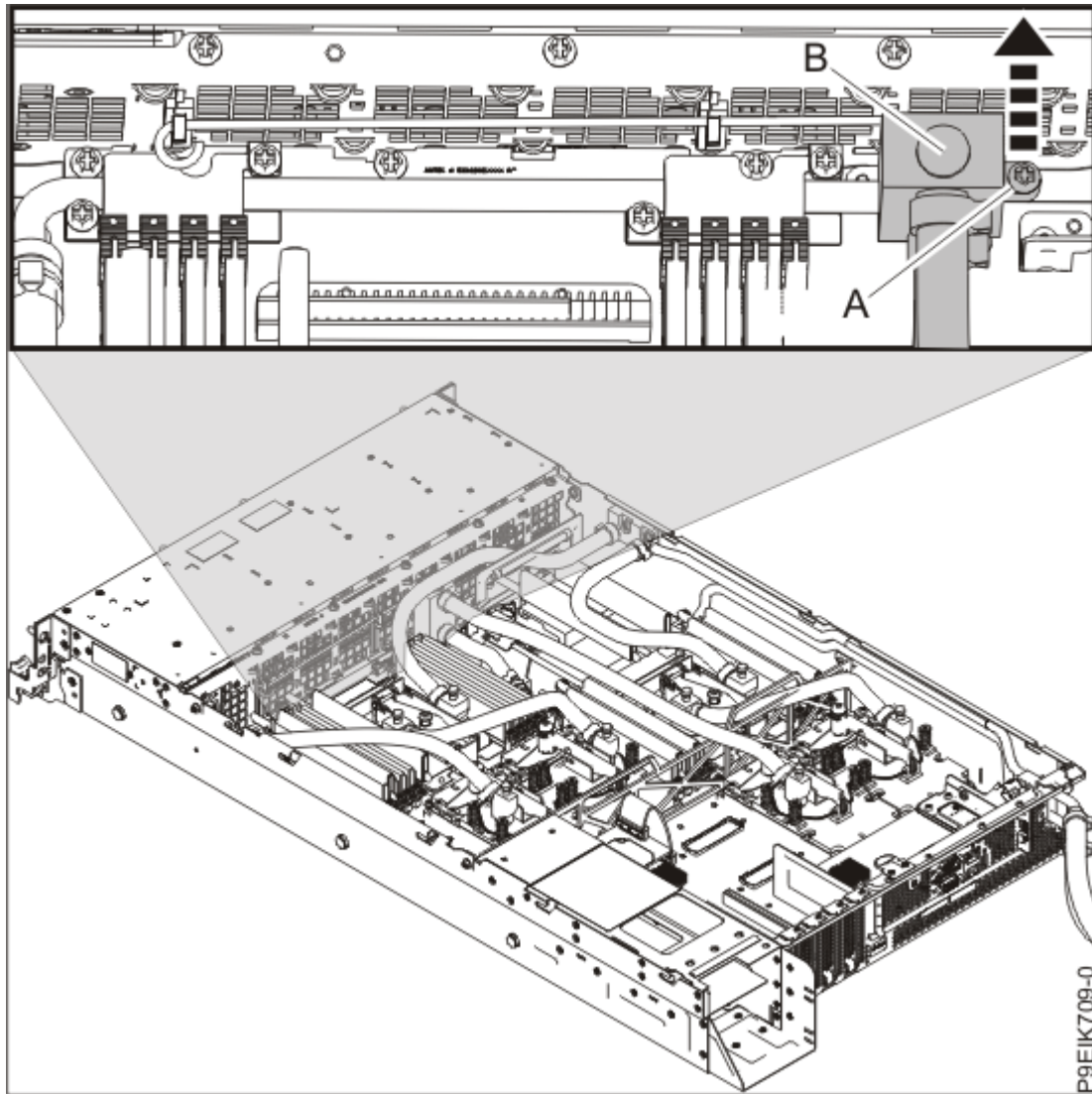


Figure 10. Loosen the front pipe screw

8. Pull the side pipes away and slightly forwards from the side of the system as shown in [Figure 11](#) on [page 15](#).

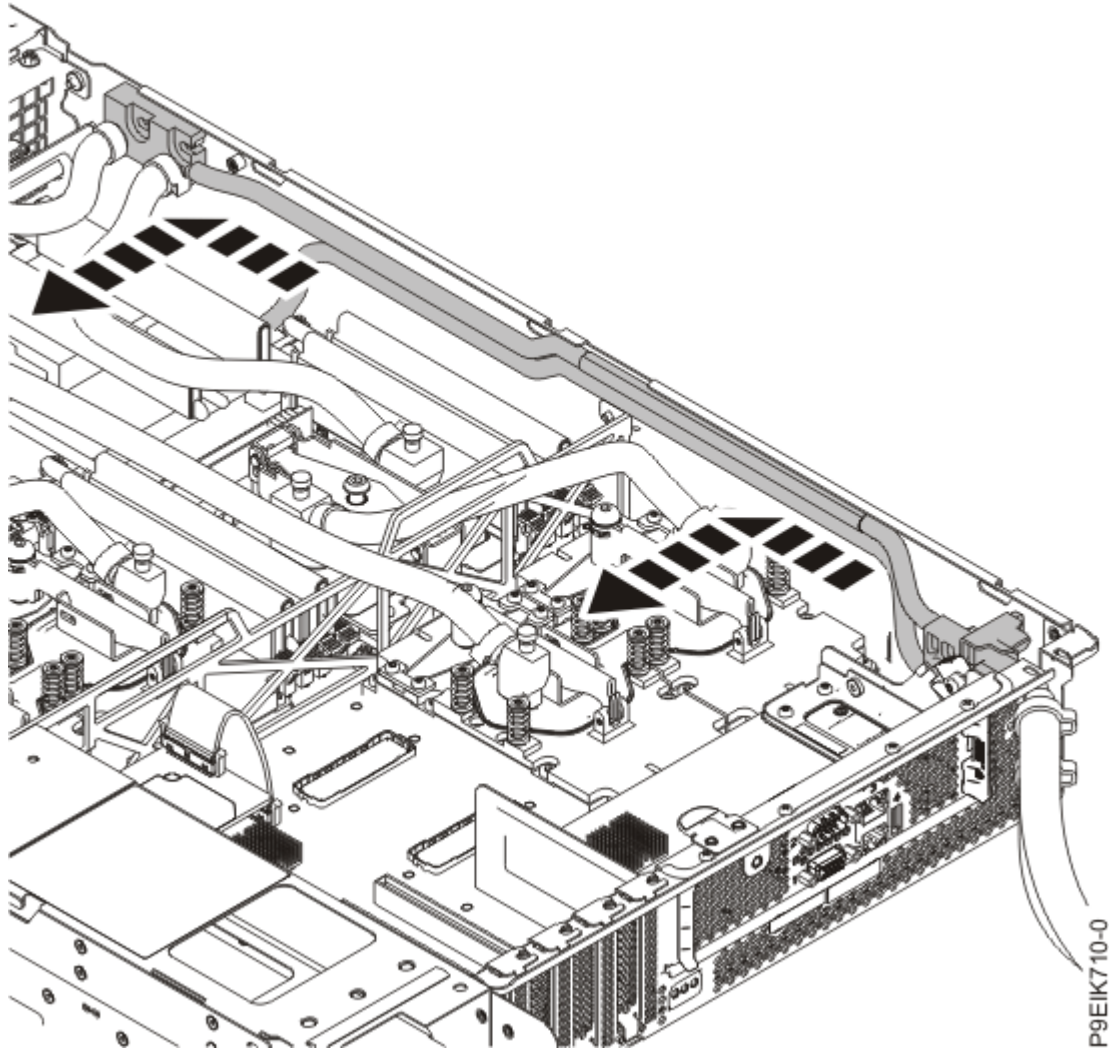


Figure 11. Loosening the side pipes

9. Lift the pipes slightly out of the chassis. Rest the pipes against the side as shown in [Figure 12](#) on [page 16](#).

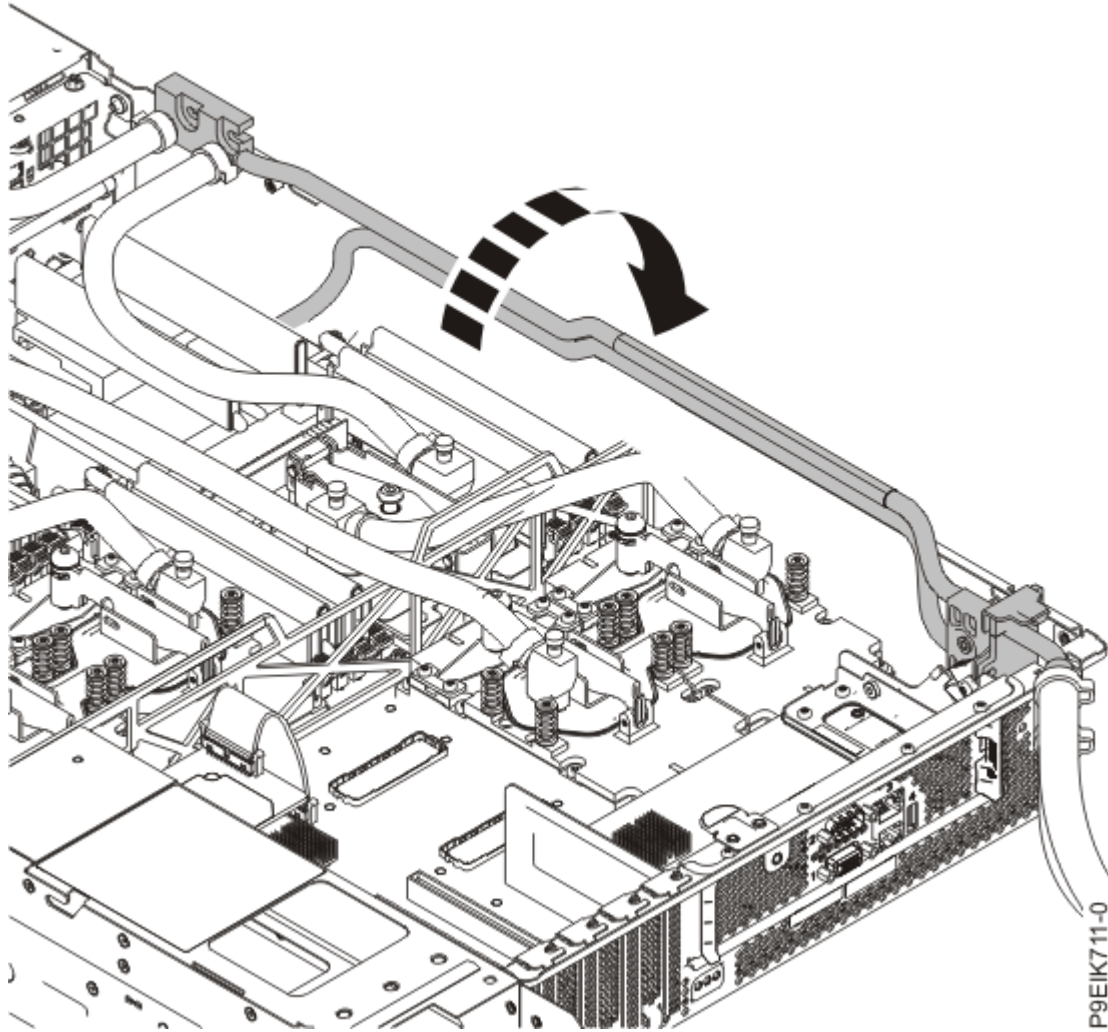
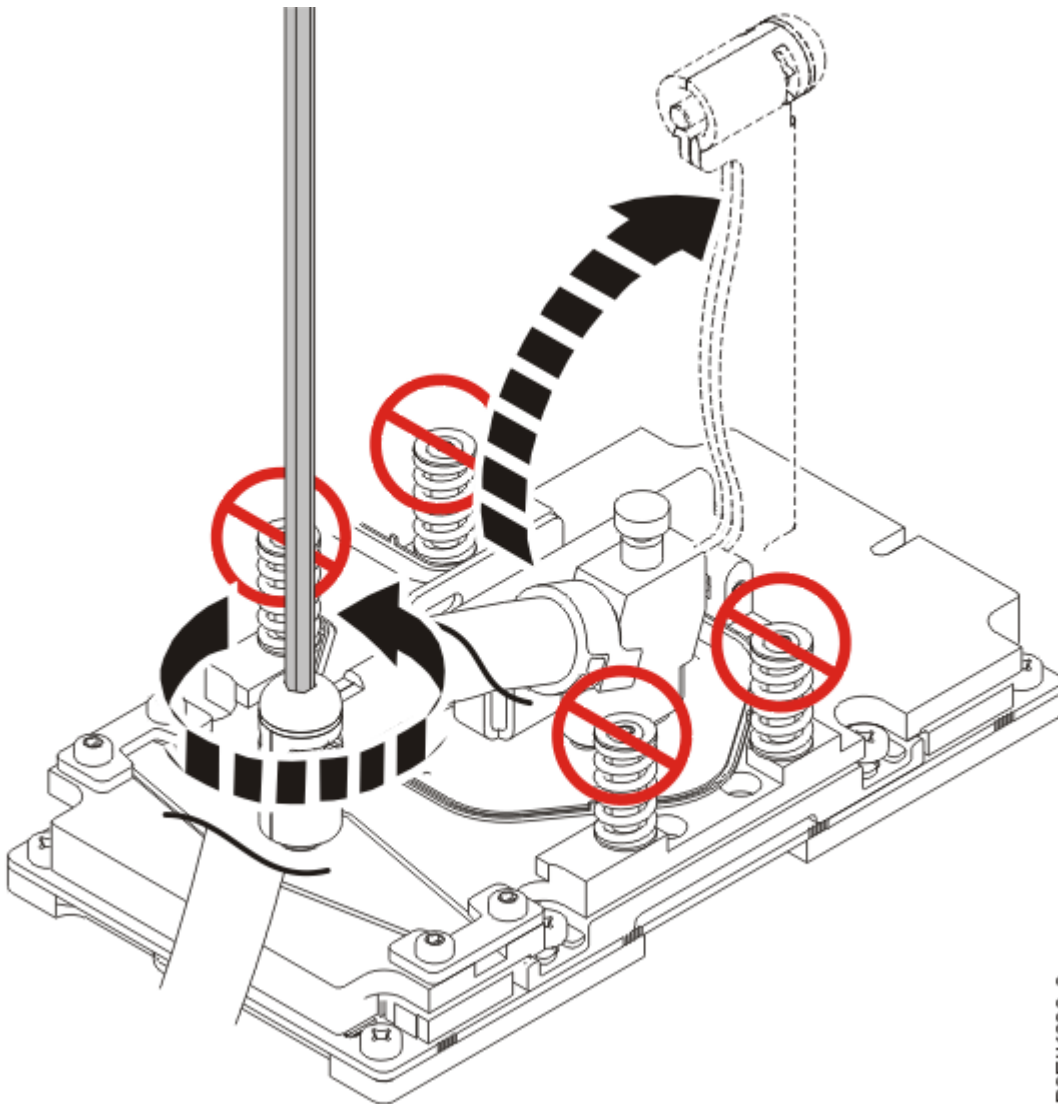


Figure 12. Lifting out the side pipes

10. For each GPU, loosen each of the cold plate retainer screws and swing each of the retainers open.



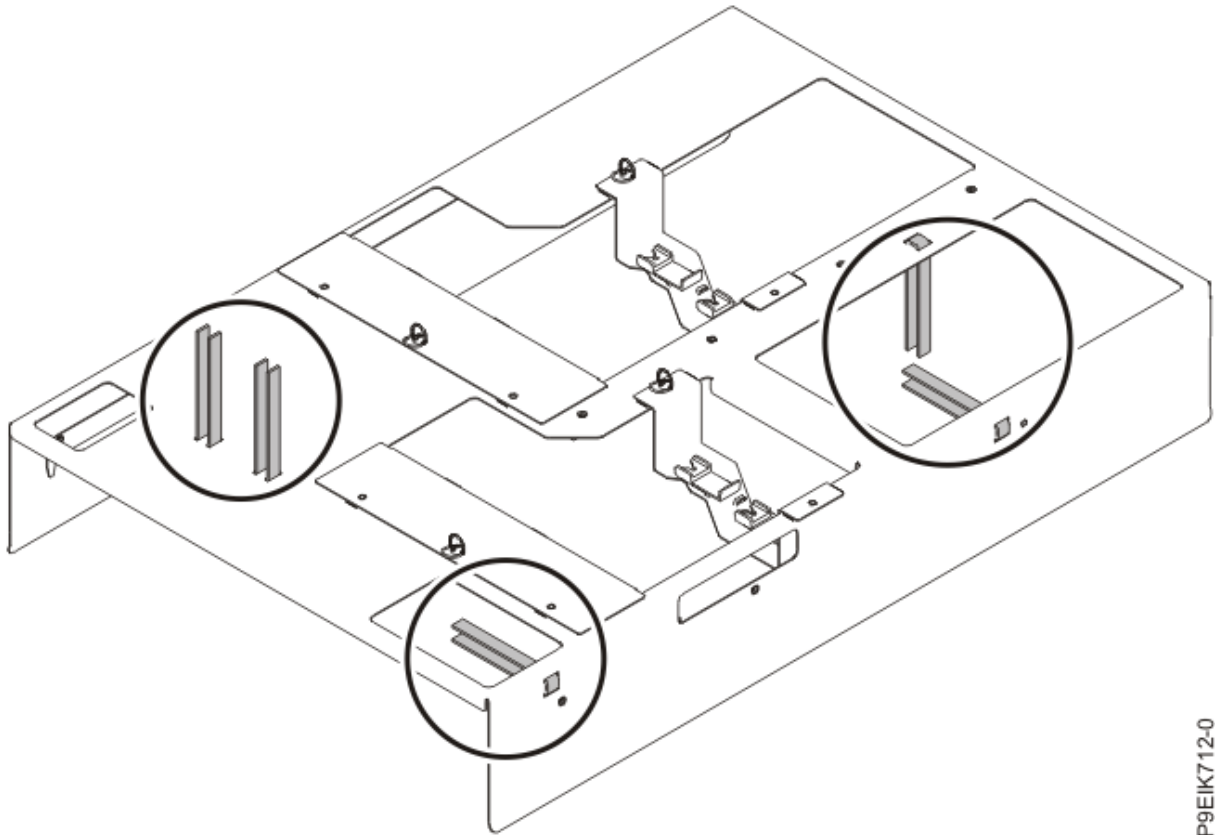
Attention: Do not unscrew the four spring-loaded screws that attach the aluminum heat cover to the GPU.



P9EIK630-0

Figure 13. Open the cold plate retainer

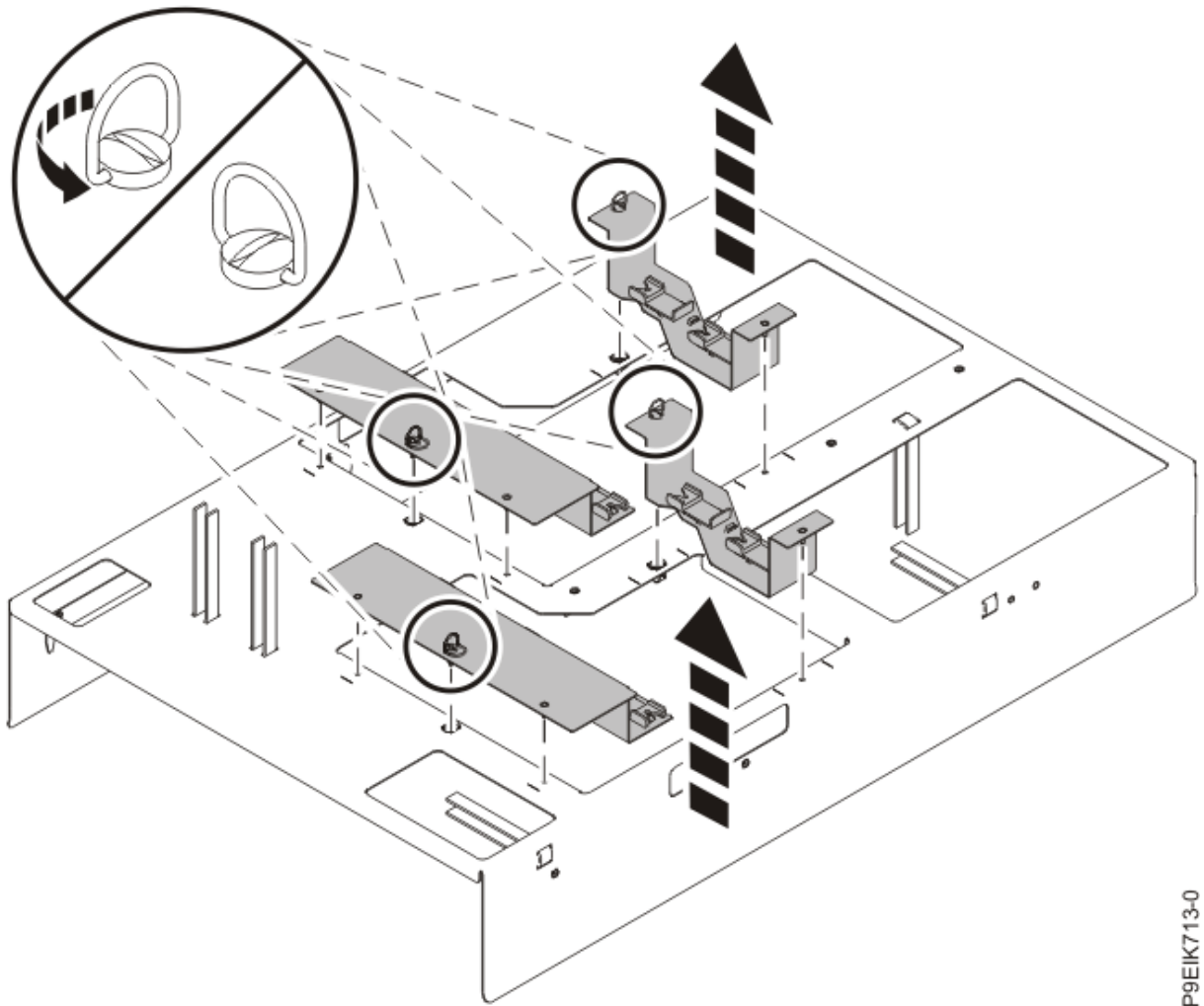
11. With the cold plate installation carrier placed on a work table, open all the hook-and-loop fasteners on the carrier as shown in [Figure 14 on page 18](#).



P9EIK712-0

Figure 14. Opening the hook-and-loop fasteners in the cold plate installation carrier

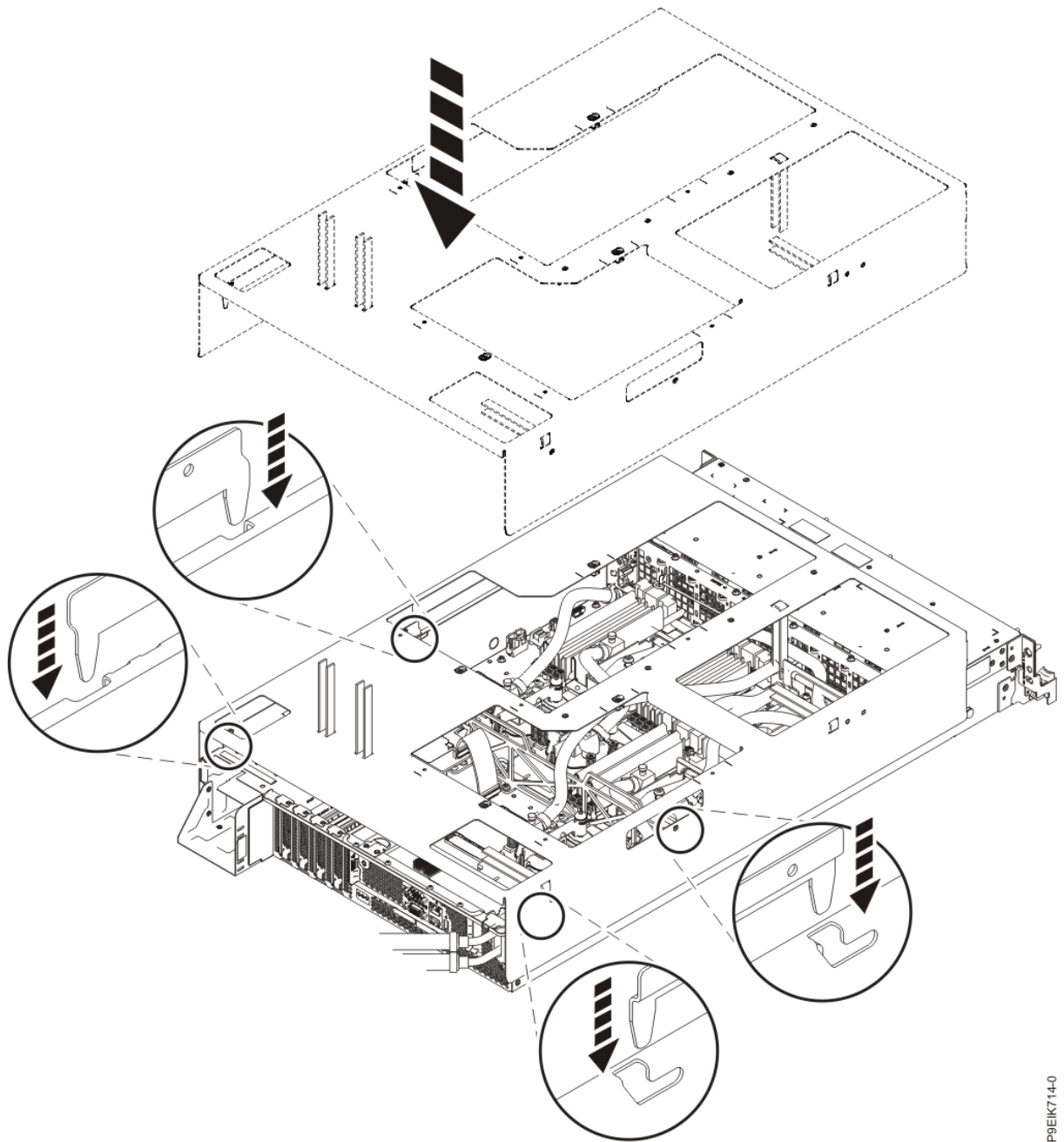
12. Remove all the holders from the cold plate installation carrier as shown in [Figure 15 on page 19](#). Unscrew the holders and place them on the work table.



P9EIK713-0

Figure 15. Removing all the holders

13. Place the cold plate installation carrier over the system as shown in [Figure 16](#) on page 20. Ensure that the alignment pins in the carrier fit into holes for the top cover.



P8EIK714-0

Figure 16. Lowering the cold plate installation carrier onto the system

14. Fasten the two water hoses to the top of the cold plate installation carrier as shown in [Figure 17](#) on [page 21](#).

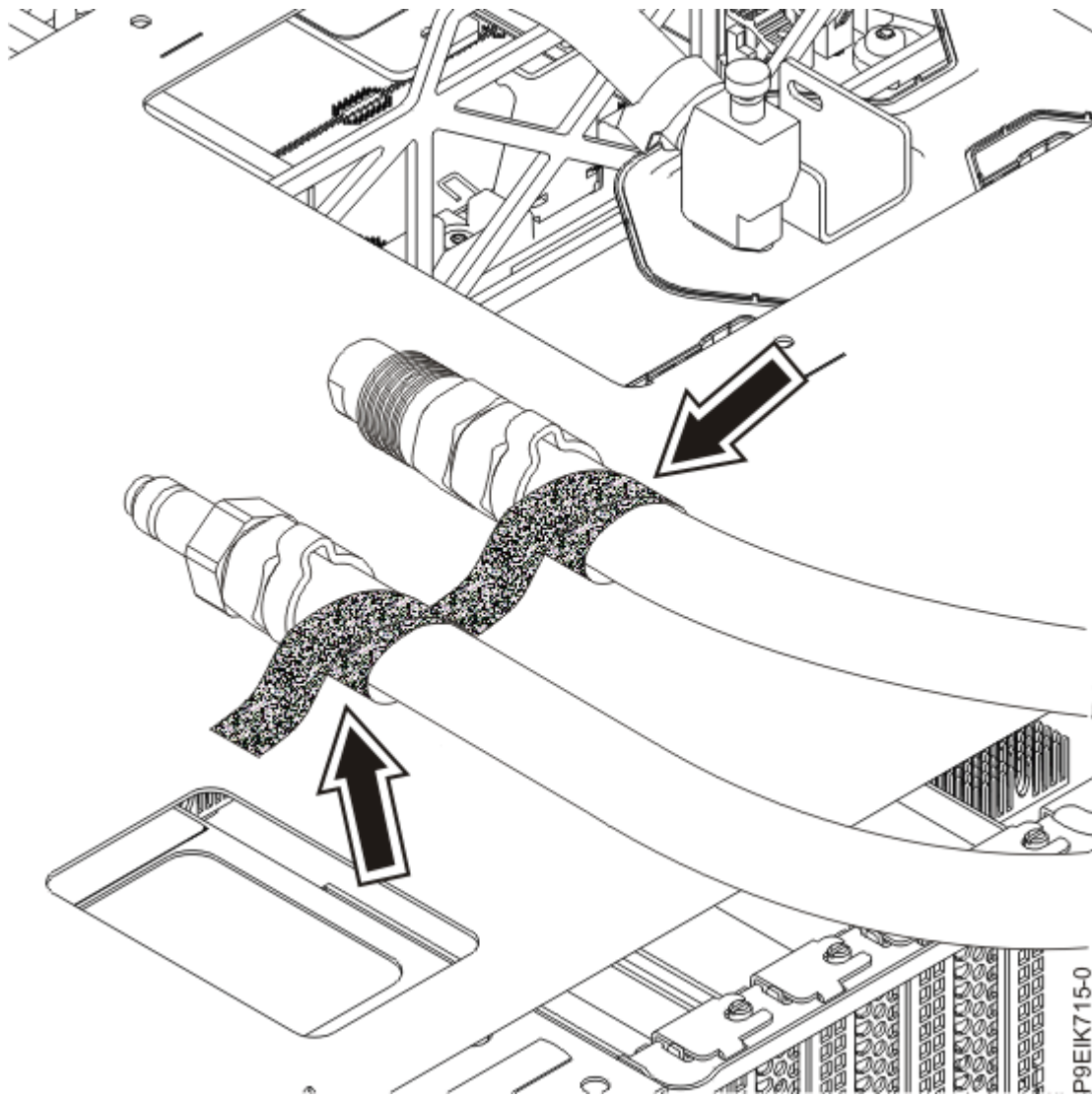
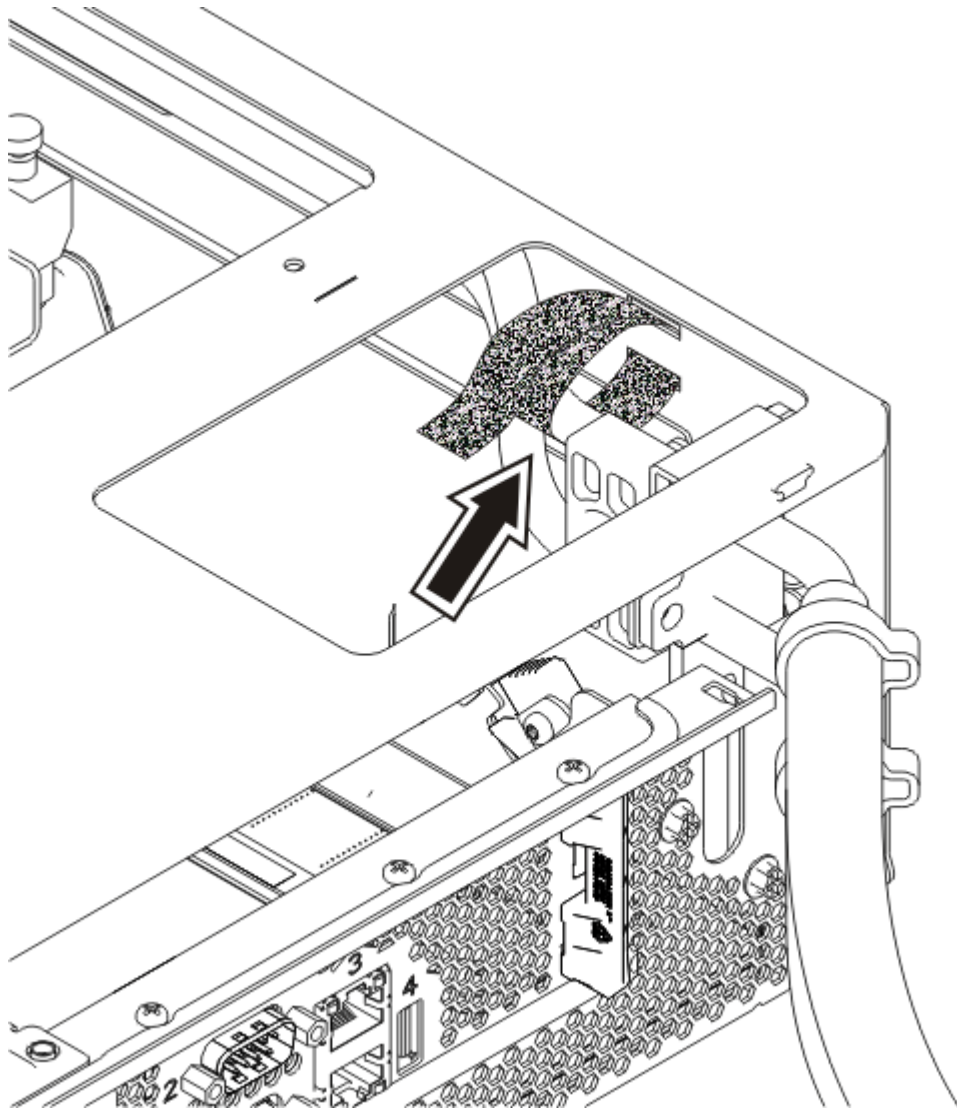


Figure 17. Securing the hoses

15. At the rear of the system, lift and fasten the rear of the side pipe to the cold plate installation carrier as shown in [Figure 18](#) on page 22.



P9EIK716-0

Figure 18. Securing the rear of the side pipe

16. At the front of the system, lift the side pipe up. Support it on the pins and fasten the front of the side pipe to the cold plate installation carrier as shown in [Figure 19](#) on page 23.

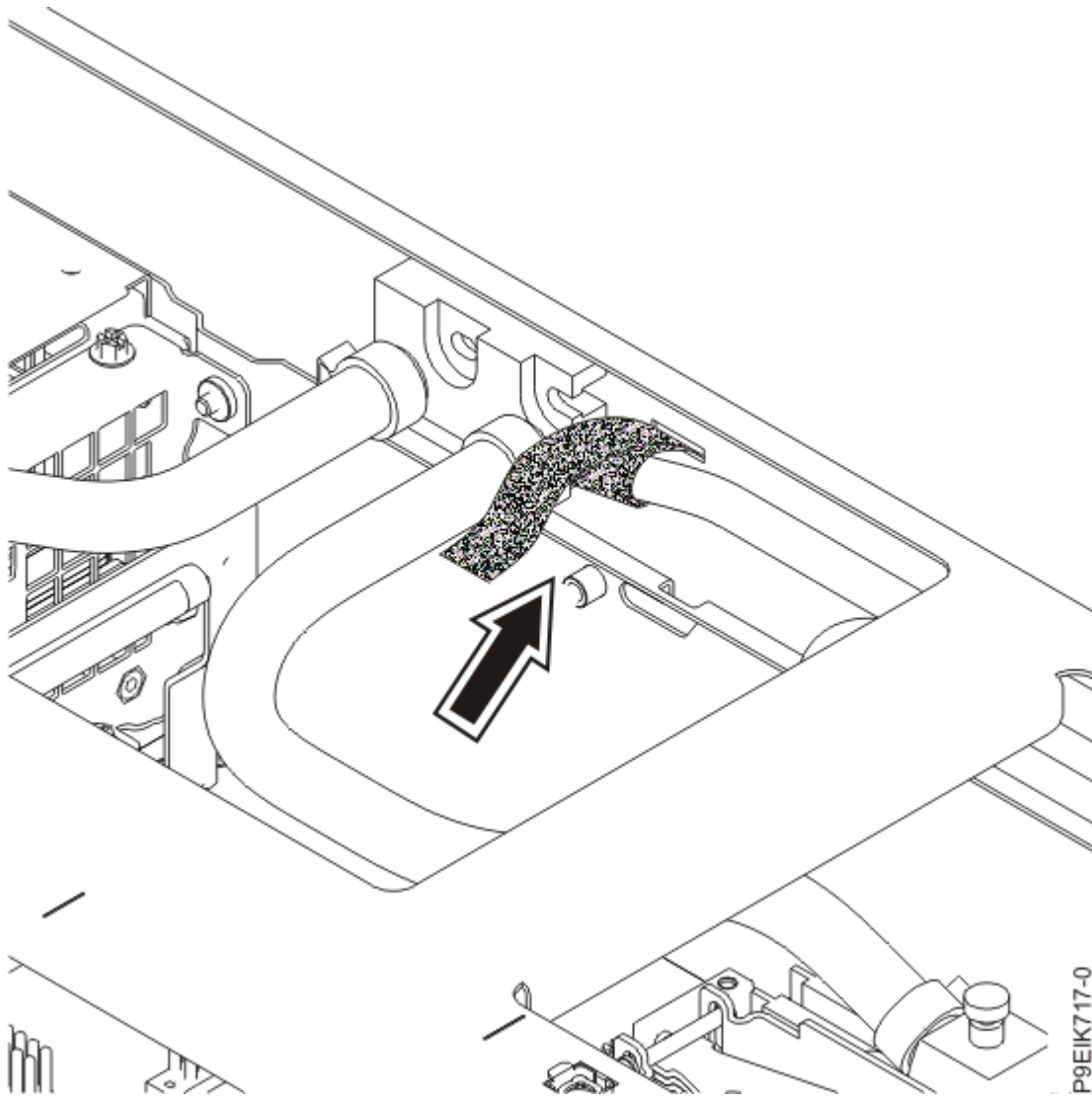


Figure 19. Securing the front of the side pipe

17. At the front of the system, lift the front pipe junction **(A)** up. Fasten the front pipe junction to the cold plate installation carrier as shown in [Figure 20](#) on page 24.

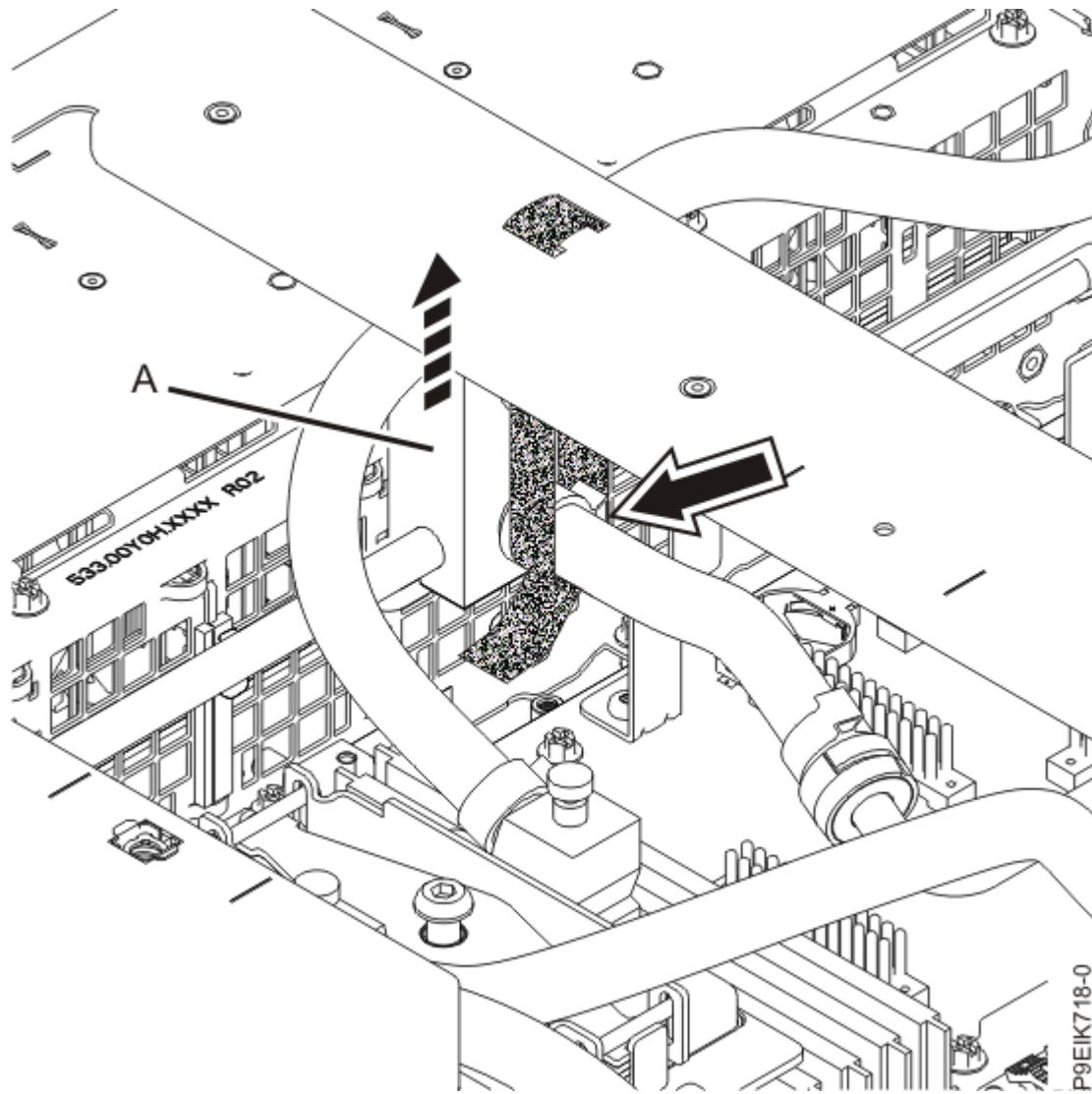
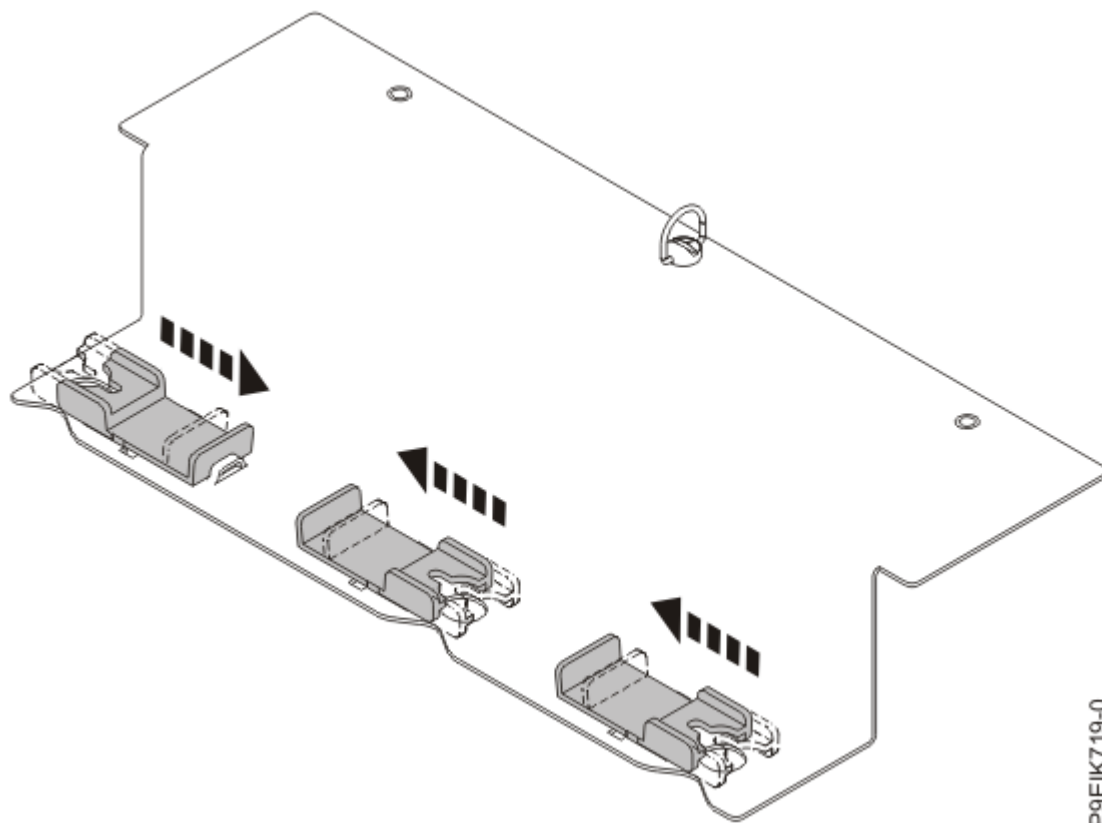


Figure 20. Securing the front pipe

18. Attach the GPU cold plate to the corresponding holder.

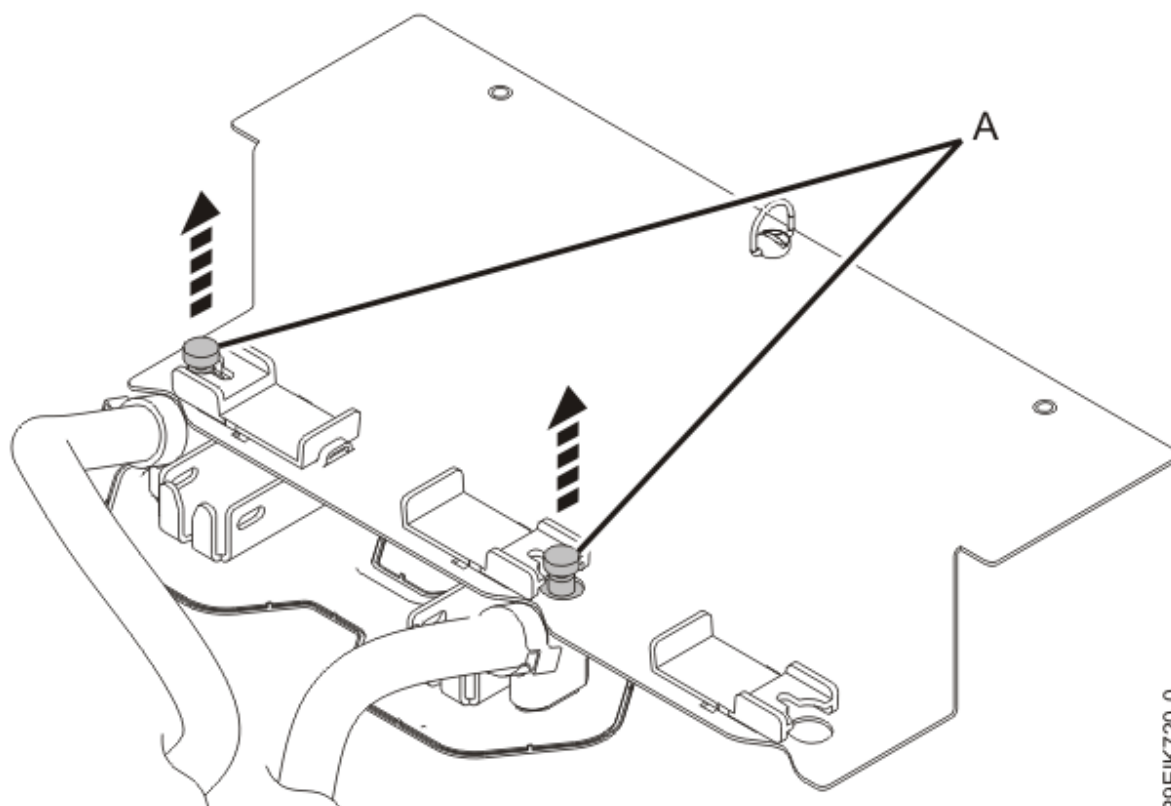
- a) Ensure that the plastic latches are in the open position on the GPU cold plate holder as shown in [Figure 21](#) on page 25.



P9EIK719-0

Figure 21. Opening the GPU holder latches

b) Insert the cold plate pins (**A**) into the holder as shown in [Figure 22 on page 25](#).



P9EIK720-0

Figure 22. Inserting the GPU cold plate pins into the holder

- c) Slide both of the plastic latches **(A)** into the narrowest part of the pin as shown in [Figure 23](#) on [page 26](#).

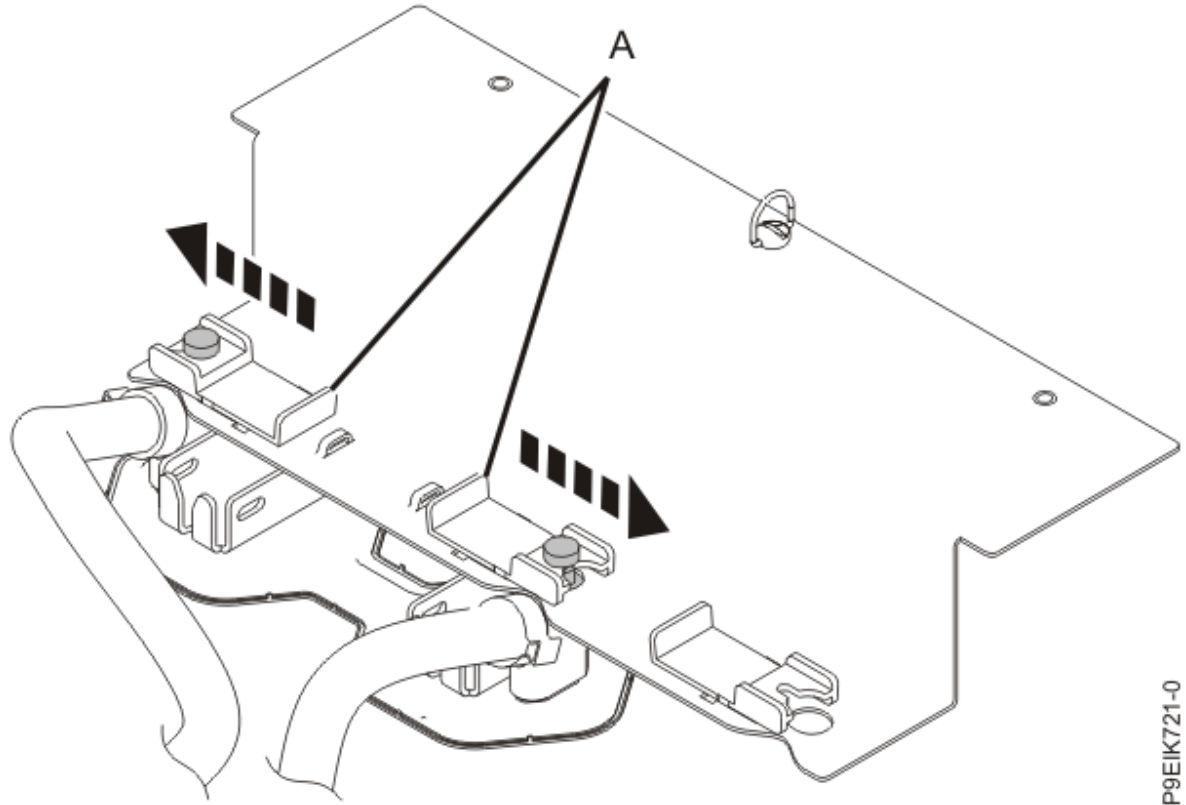


Figure 23. Securing the GPU cold plate pins

- d) Repeat step [“18”](#) on [page 24](#) for the other GPU cold plate.
19. Fasten each GPU cold plate holder to the cold plate installation carrier as shown in [Figure 24](#) on [page 27](#). Use the alignment pins **(A)** and tighten the screw **(B)** to secure the holder to the carrier.

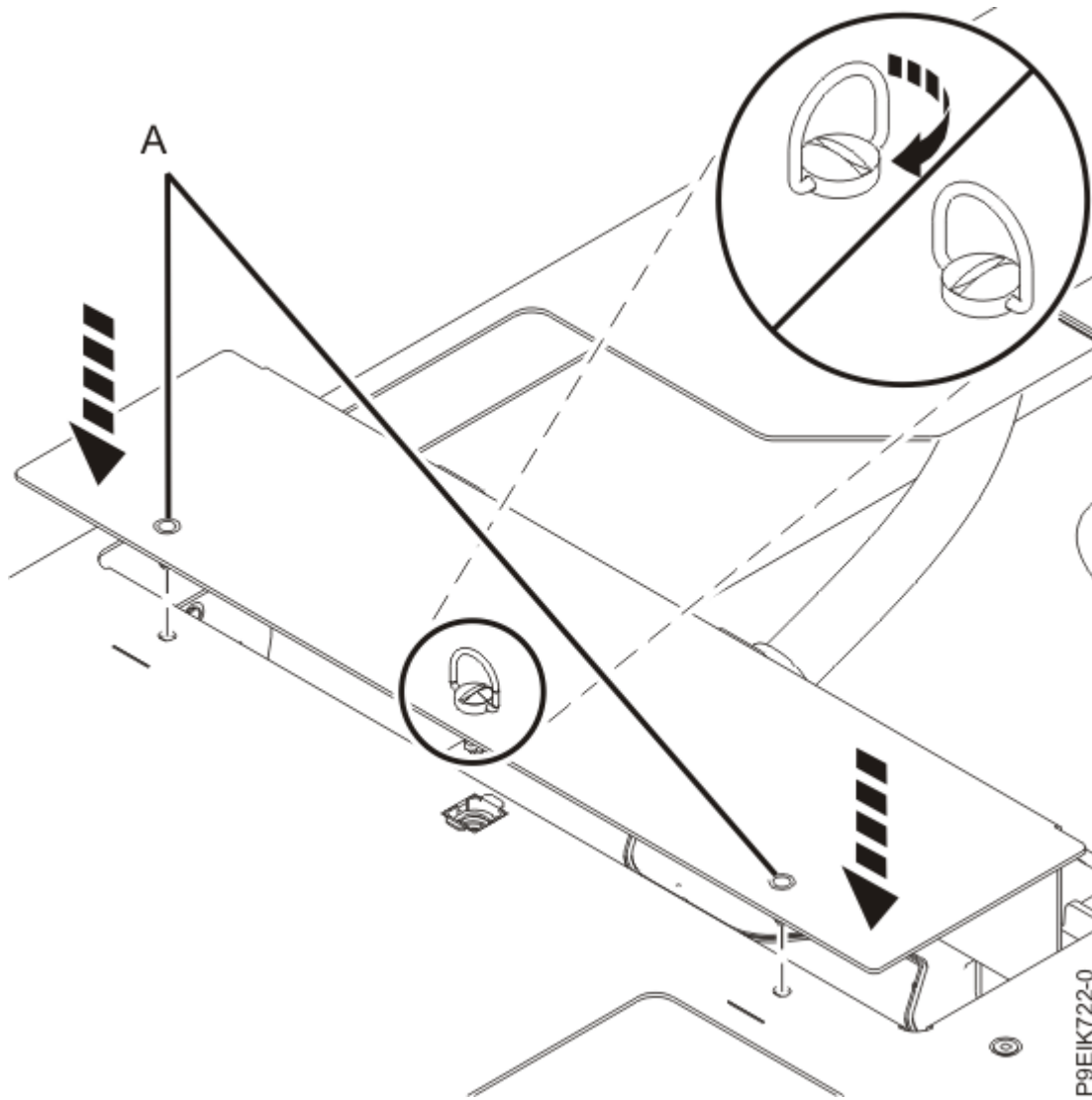
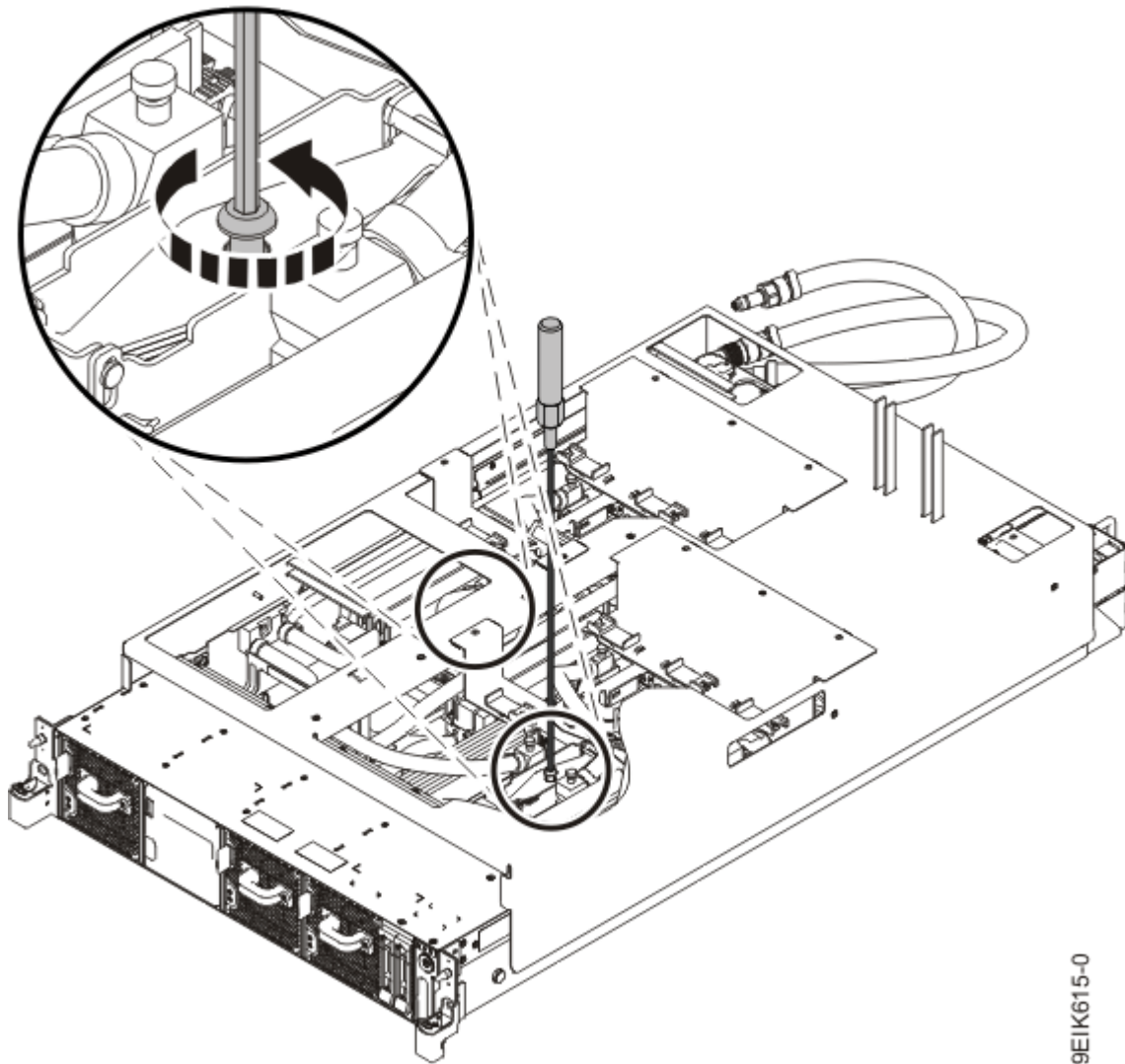


Figure 24. Placing the GPU holder back onto the carrier

20. Apply light pressure downward on the cold plate. Loosen the retainer screw of the system processor module cold plate by turning the supplied hex key counterclockwise. Loosen the screw until it moves freely.

See [Figure 25 on page 28](#).

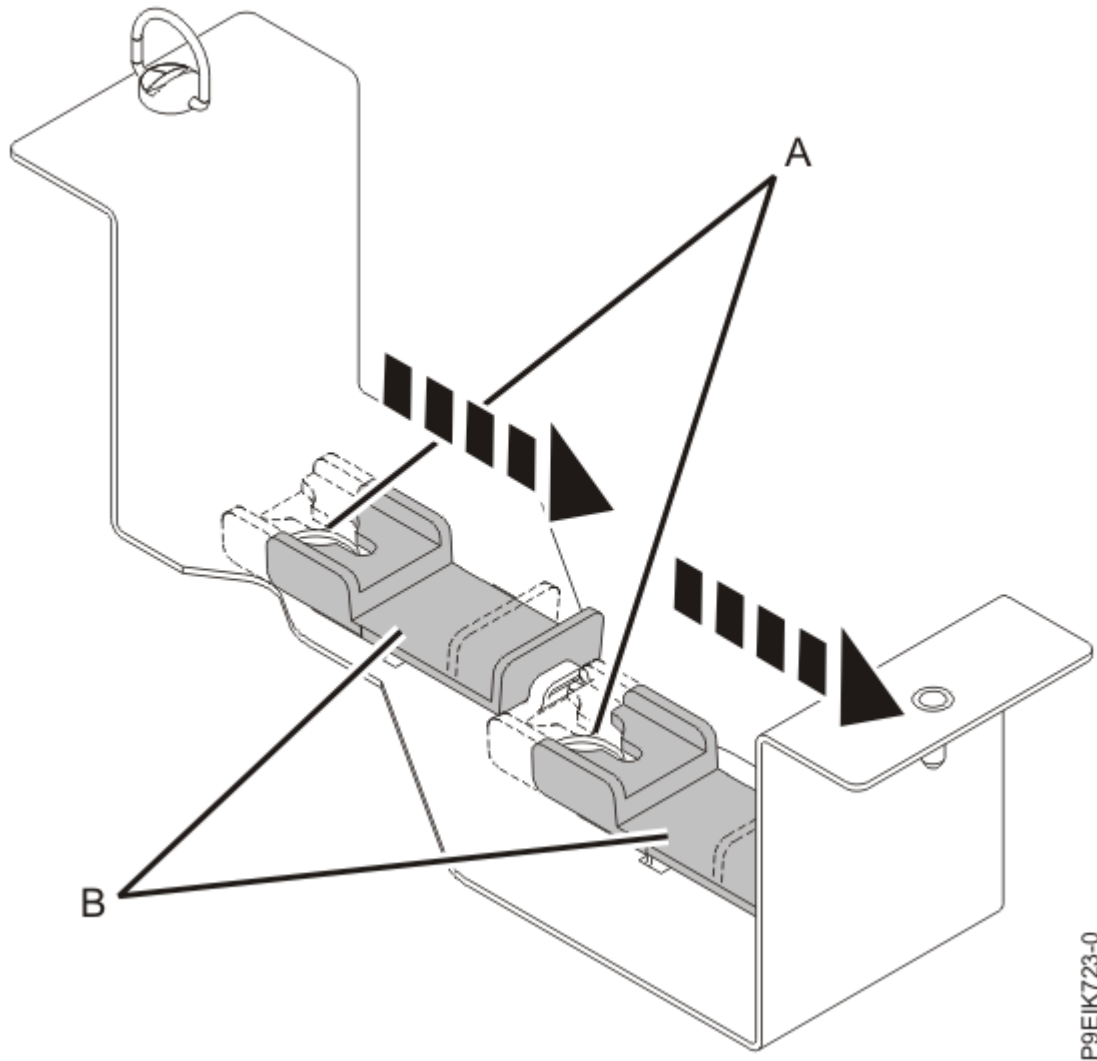


P9EIK615-0

Figure 25. Loosening the cold plate retainer screw

21. Attach the processor cold plate to the holder by using the following steps:

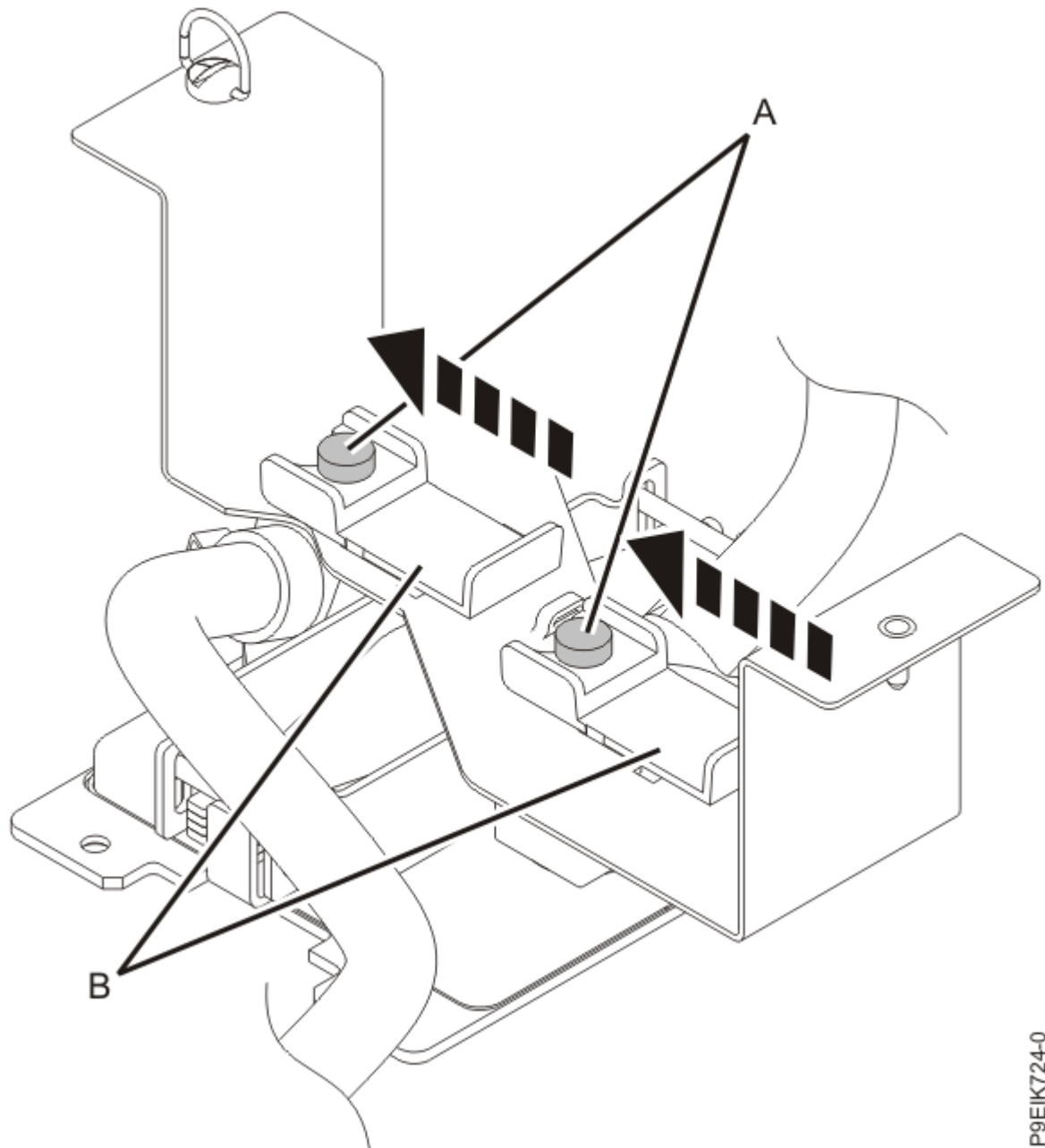
- a) On the processor cold plate holder, ensure that the plastic latches **(B)** are in the open position as shown in [Figure 26](#) on page 29, so that the holes **(A)** are exposed.



P9EIK723-0

Figure 26. Opened holder latches

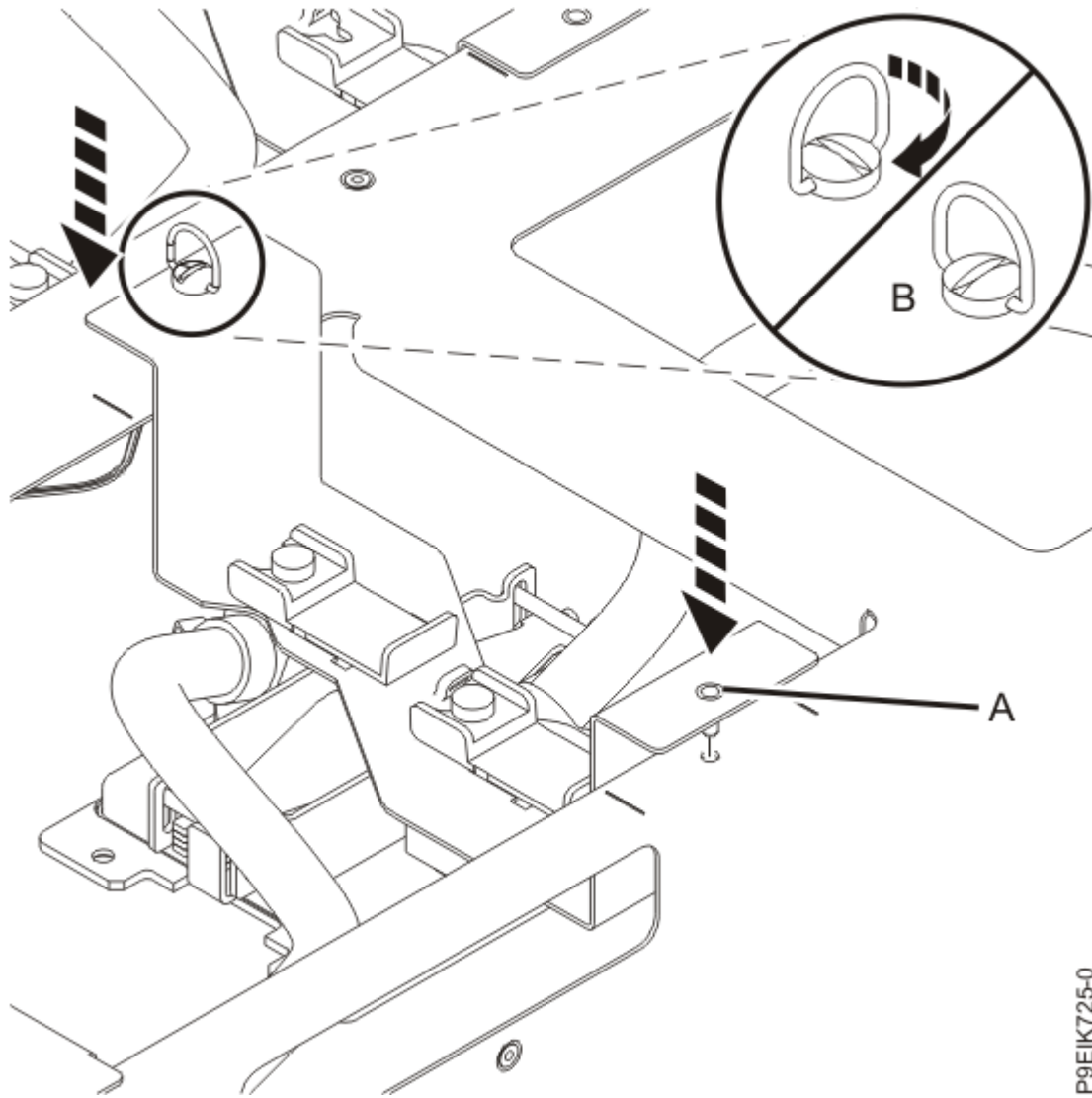
- b) Lift the coldplate straight up from the processor. Insert the cold plate pins **(A)** into the holder as shown in [Figure 27](#) on page 30.



P9EIK724-0

Figure 27. Inserting the cold plate pins into the holder

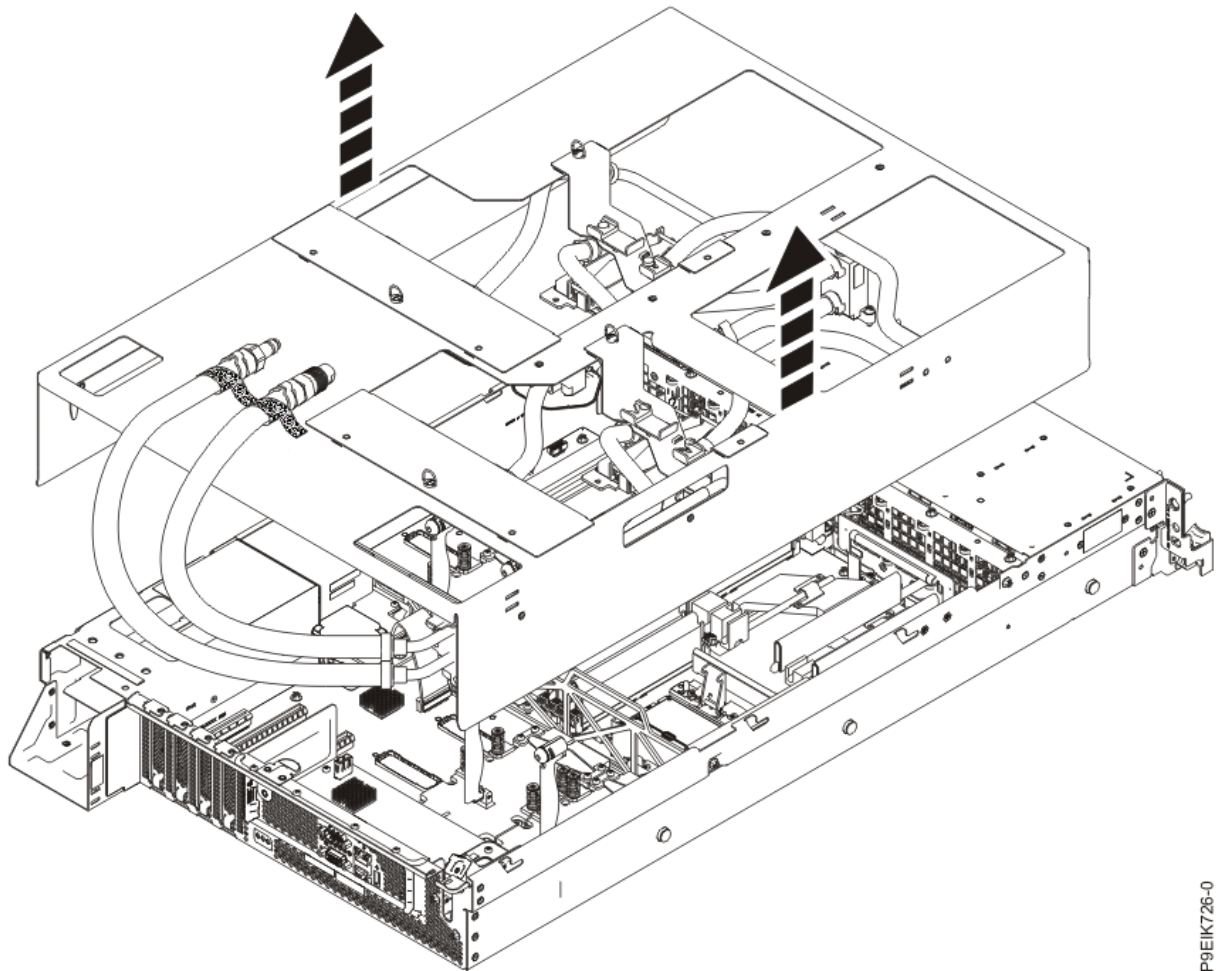
- c) Slide both of the plastic latches **(B)** into the narrowest part of the pin as shown in [Figure 27](#) on [page 30](#).
- d) Fasten the processor cold plate holder to the cold plate installation carrier. Use the alignment pin **(A)** and tighten the screw **(B)** to secure the holder to the carrier.



P9EIK725-0

Figure 28. Placing the processor holder back onto the carrier

22. Repeat steps “20” on page 27 - “21” on page 28 for the other processor.
23. 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 29 on page 32](#).
If you lift at an angle, the carrier catches on the cold plate clips.



P9EIK7 26-0

Figure 29. Lifting the cold plate installation carrier

24. 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-GTW or 8335-GTX cold plate installation carrier

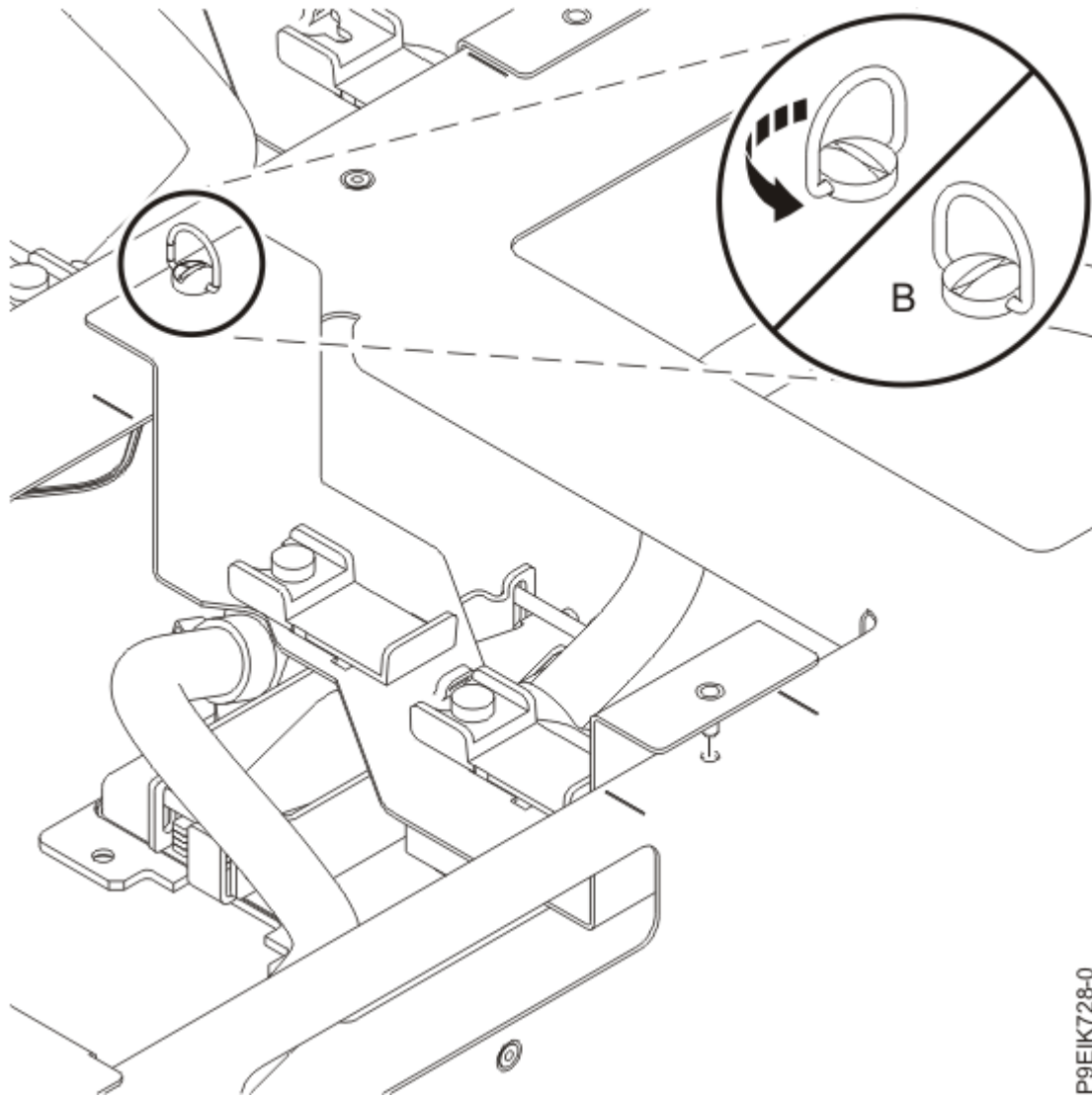
To replace the cold plates in the cold plate installation carrier, complete the steps in this procedure.

Before you begin

To replace a faulty cold plate or water hose, you first need to complete the procedure: [“Removing the cold plates from the 8335-GTW or 8335-GTX system”](#) on page 8

Procedure

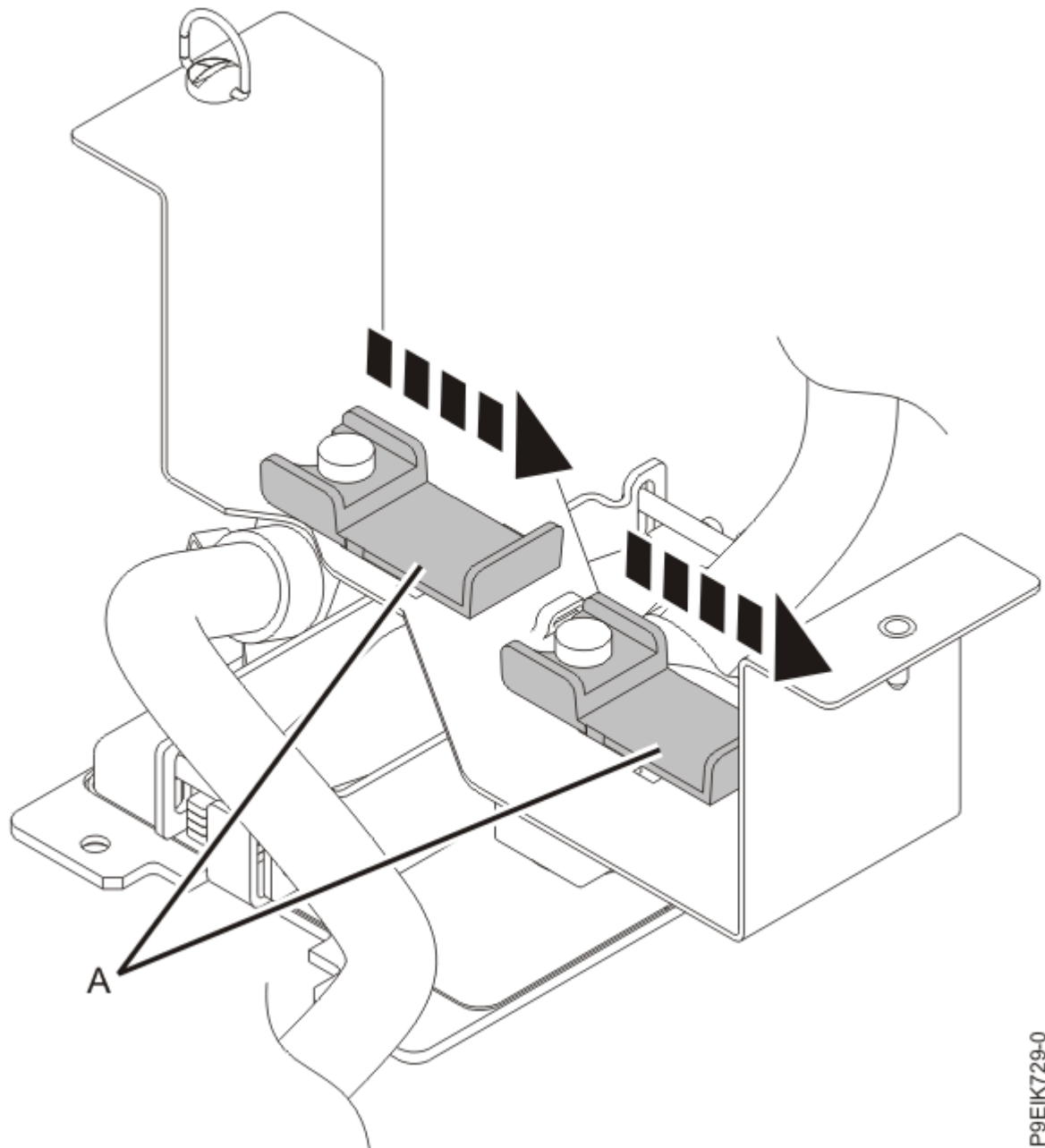
1. On your work table, place the replacement cold plate assembly next to the cold plate installation carrier.
2. Remove each processor cold plate from its holder.
 - a) Unscrew a processor cold plate holder from the cold plate installation carrier as shown in [Figure 30](#) on page 33.



P9EIK728-0

Figure 30. Removing the processor cold plate holder from the carrier

- b) Support the cold plate from underneath and carefully slide both of the plastic latches **(A)** to free the pins from the holder as shown in [Figure 31](#) on page 34.



P9EIK729-0

Figure 31. Removing the processor cold plate pins from the holder

- c) Gently lower the cold plate to the work surface.
The cold plate is resting on the work table. Repeat step "2" on page 32 for each cold plate.
3. Remove each GPU cold plate from its holder.
 - a) Unscrew a GPU cold plate holder from the cold plate installation carrier as shown in [Figure 32 on page 35](#).

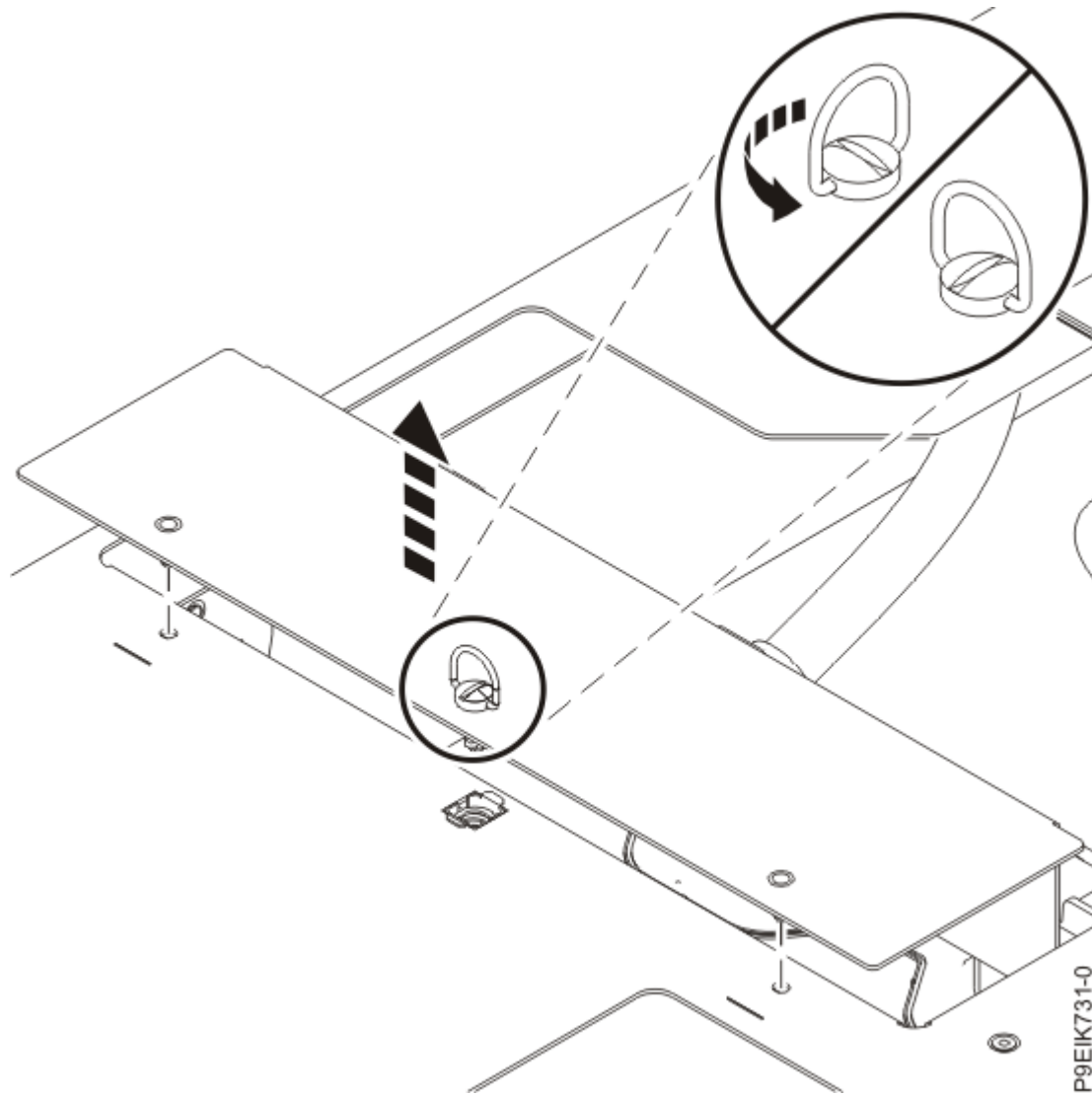
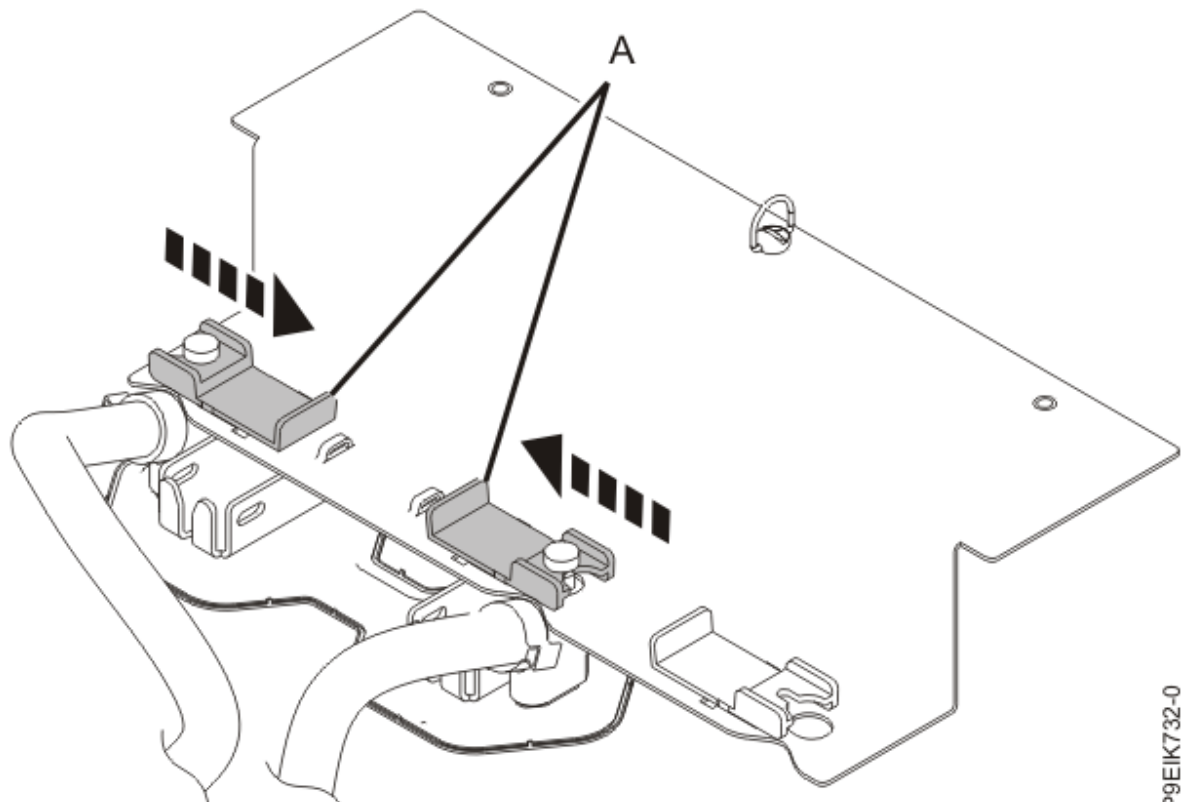


Figure 32. Removing the GPU cold plate holder from the carrier

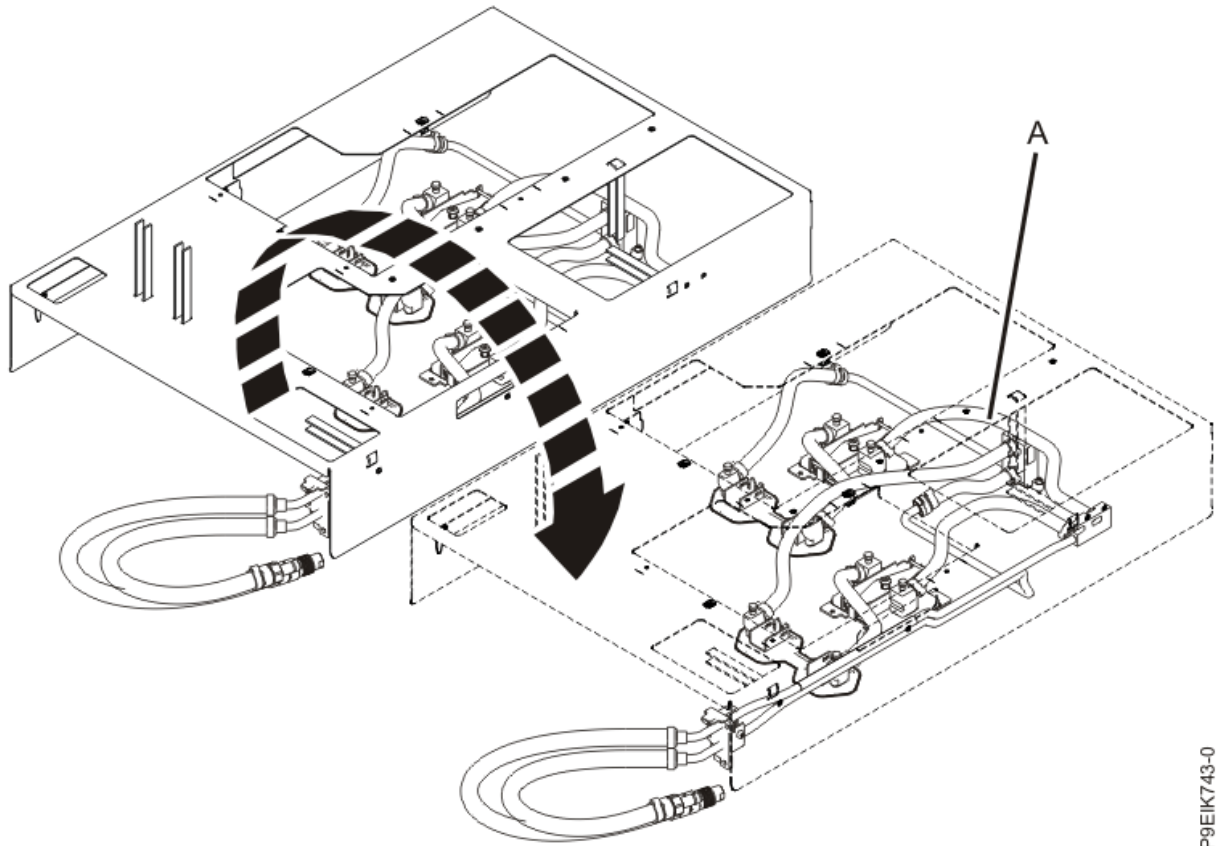
- b) Support the cold plate from underneath and carefully slide both of the plastic latches **(A)** to free the pins from the holder as shown in [Figure 33 on page 36](#).



P9EIK732-0

Figure 33. Removing the GPU cold plate from the holder

- c) Gently lower the cold plate to the work surface.
The cold plate is resting on the work table. Repeat step “3” on page 34 for each cold plate.
4. Unfasten all the hook-and-loop fasteners on the cold plate installation carrier.
Ensure that all the water pipes are released from the holder.
5. 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 34 on page 37](#).



P9EIK743-0

Figure 34. Moving the cold plate installation carrier over the replacement cold plate assembly

6. Fasten the two water hoses to the top of the cold plate installation carrier as shown in [Figure 35](#) on [page 38](#).

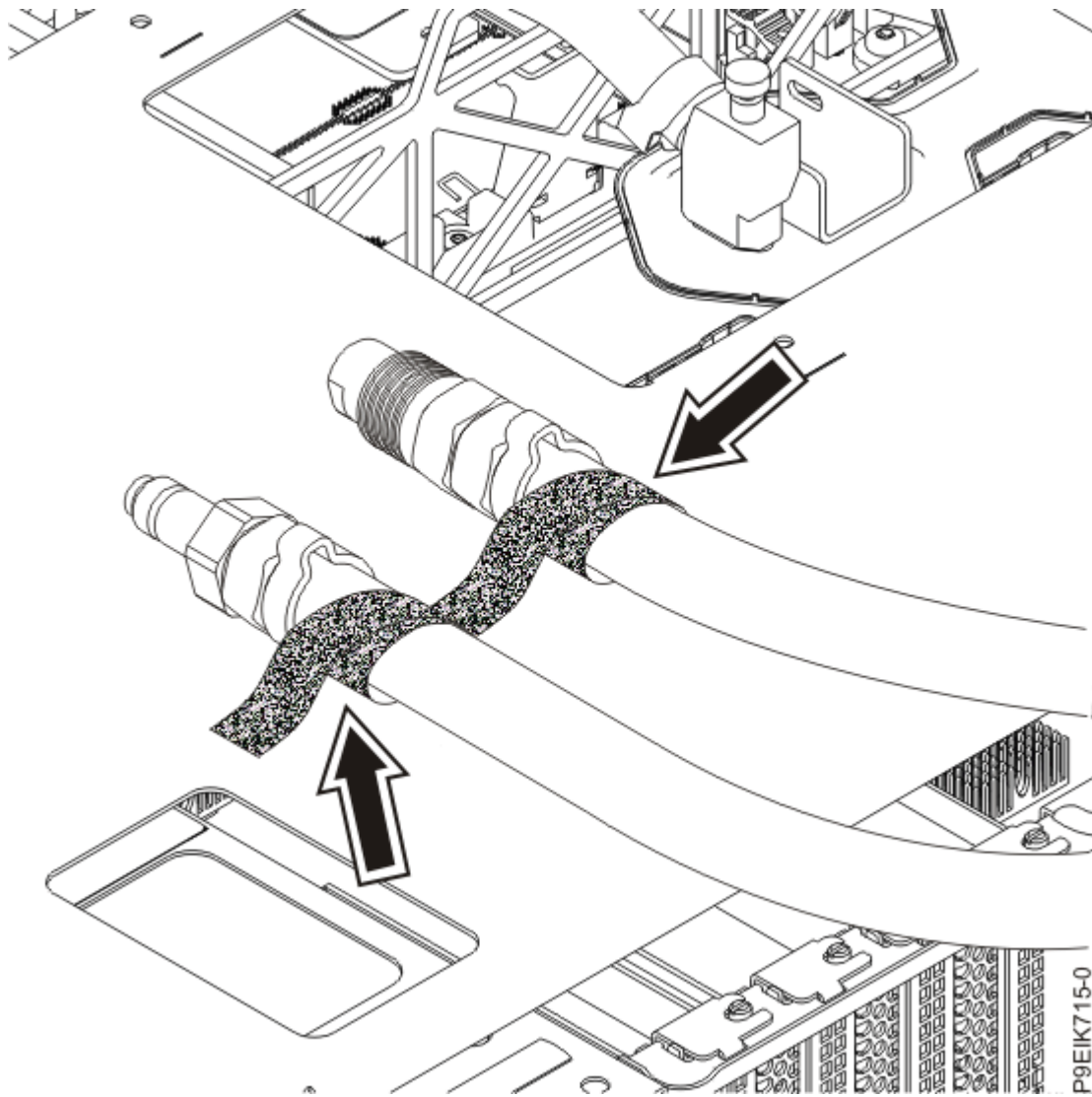
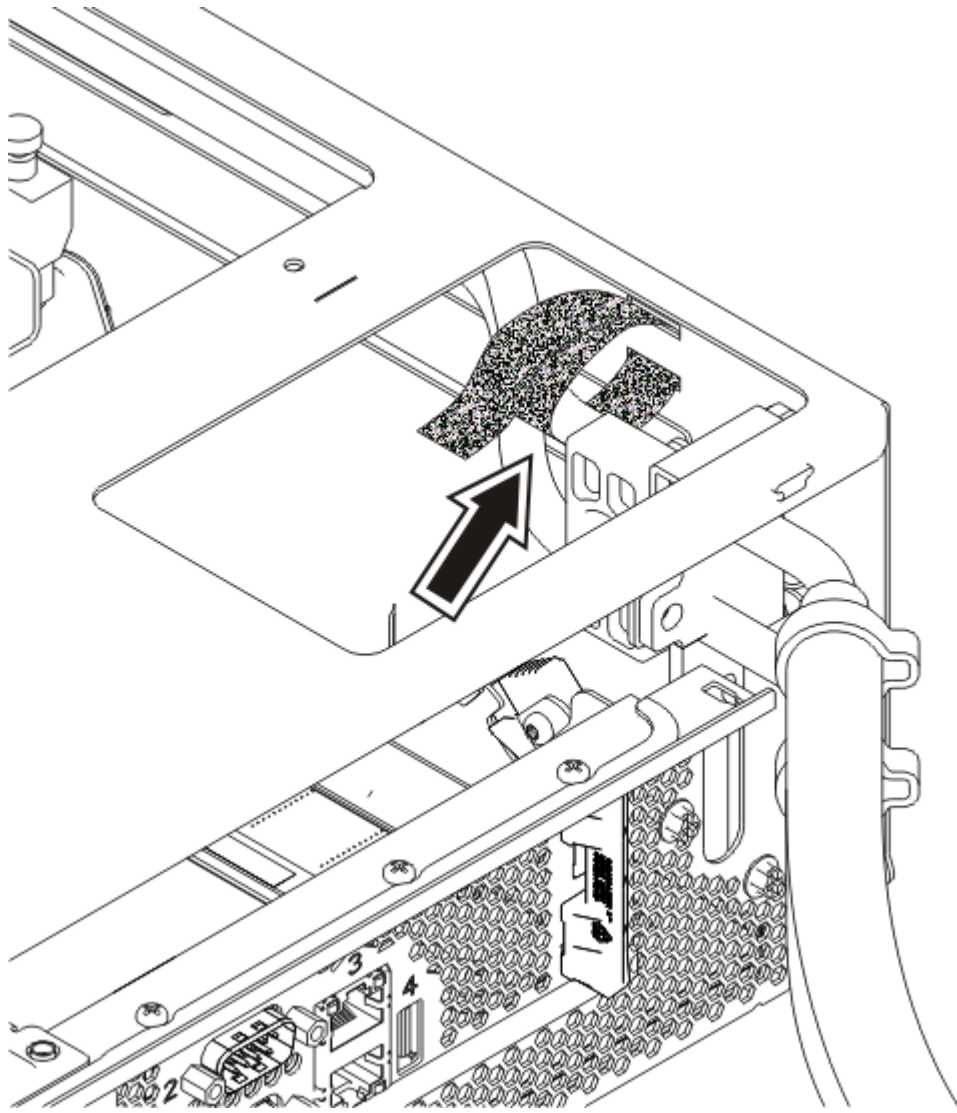


Figure 35. Securing the hoses

7. At the rear of the system, lift and fasten the rear of the side pipe to the cold plate installation carrier as shown in [Figure 36](#) on page 39.



P9EIK716-0

Figure 36. Securing the rear of the side pipe

8. At the front of the system, lift the side pipe up. Support it on the pins and fasten the front of the side pipe to the cold plate installation carrier as shown in [Figure 37](#) on page 40.

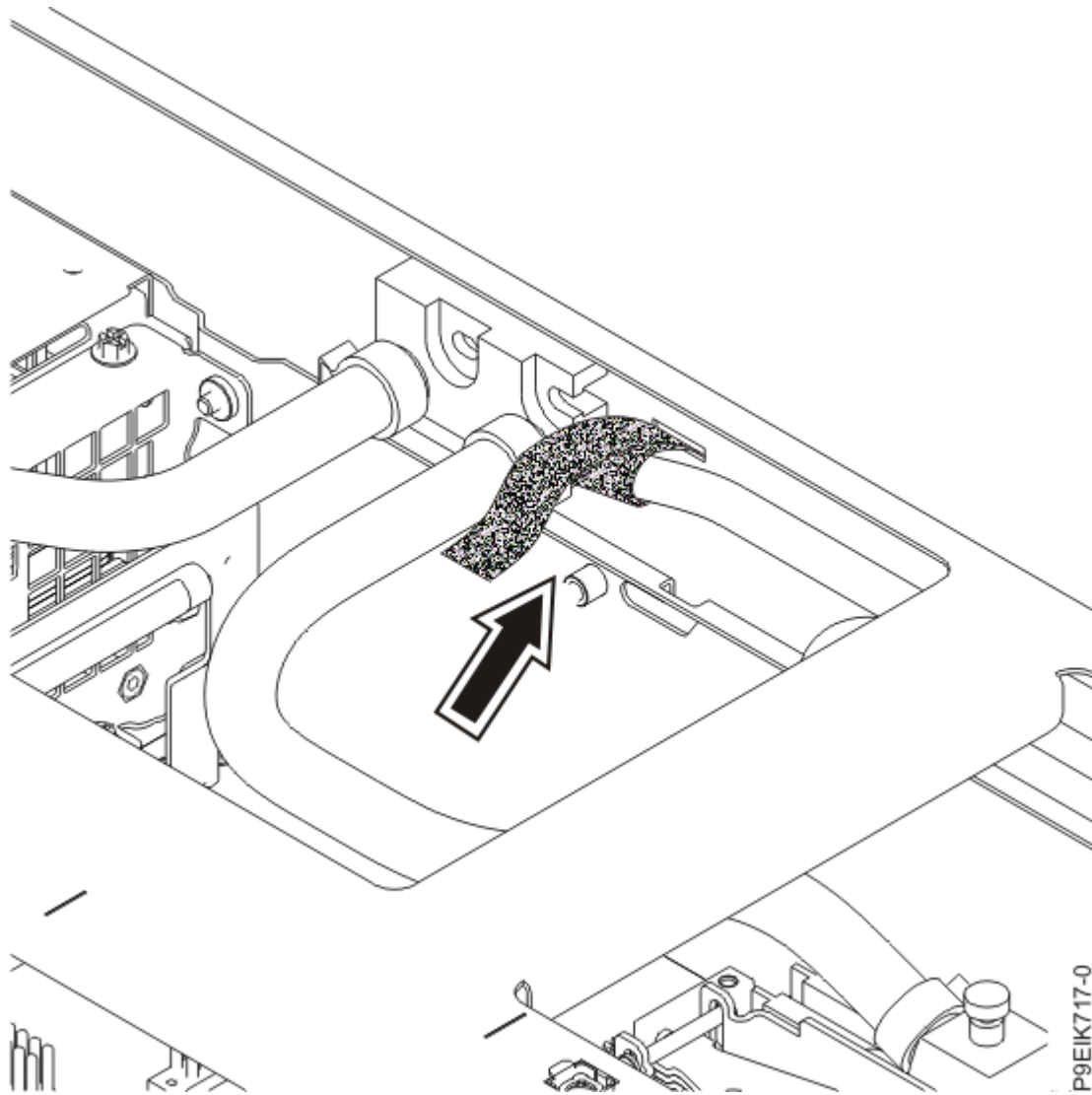


Figure 37. Securing the front of the side pipe

9. At the front of the system, lift the front pipe junction **(A)** up. Fasten the front pipe junction to the cold plate installation carrier as shown in [Figure 38](#) on page 41.

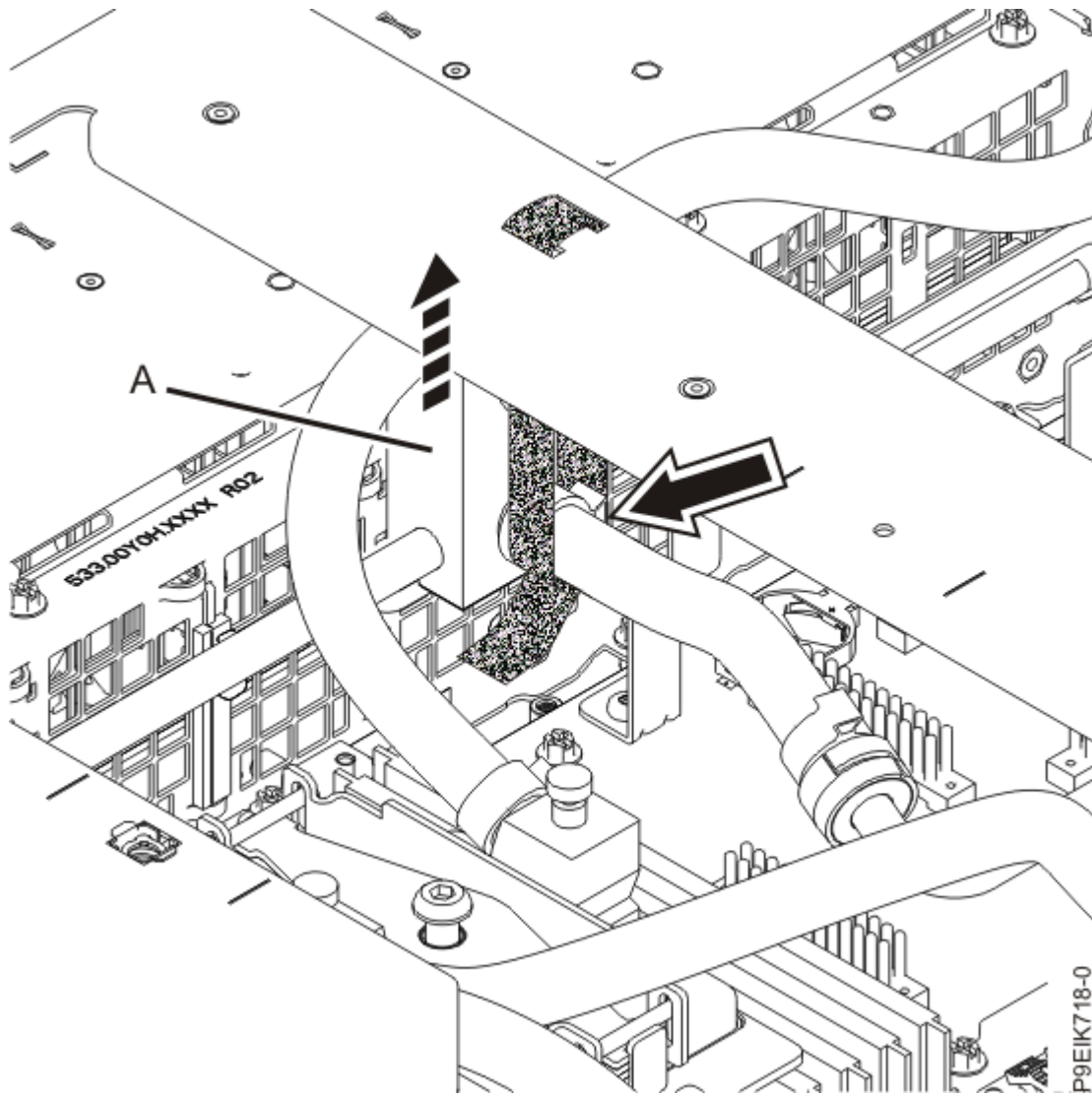
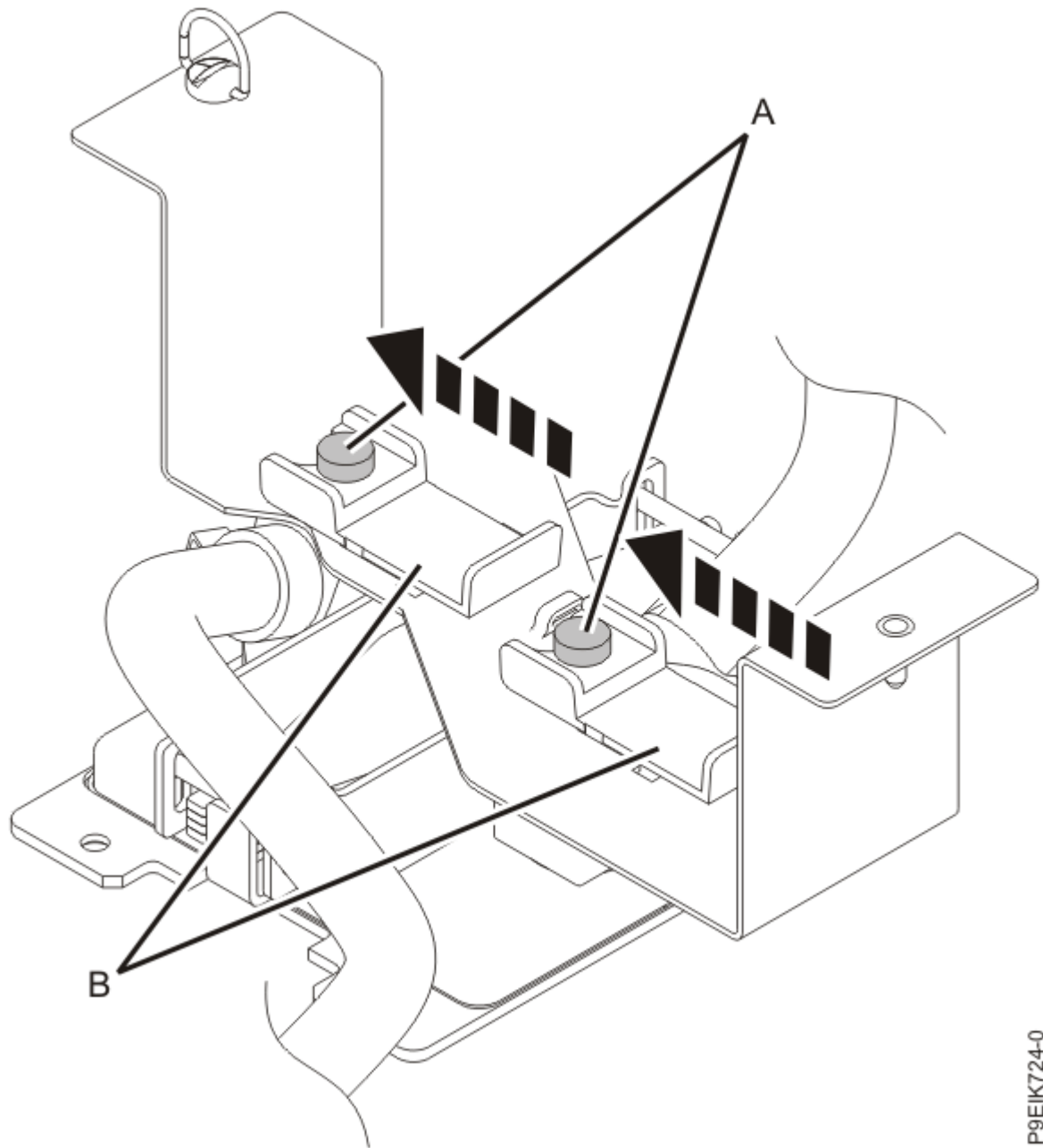


Figure 38. Securing the front pipe

10. Attach the processor cold plates to the holder.

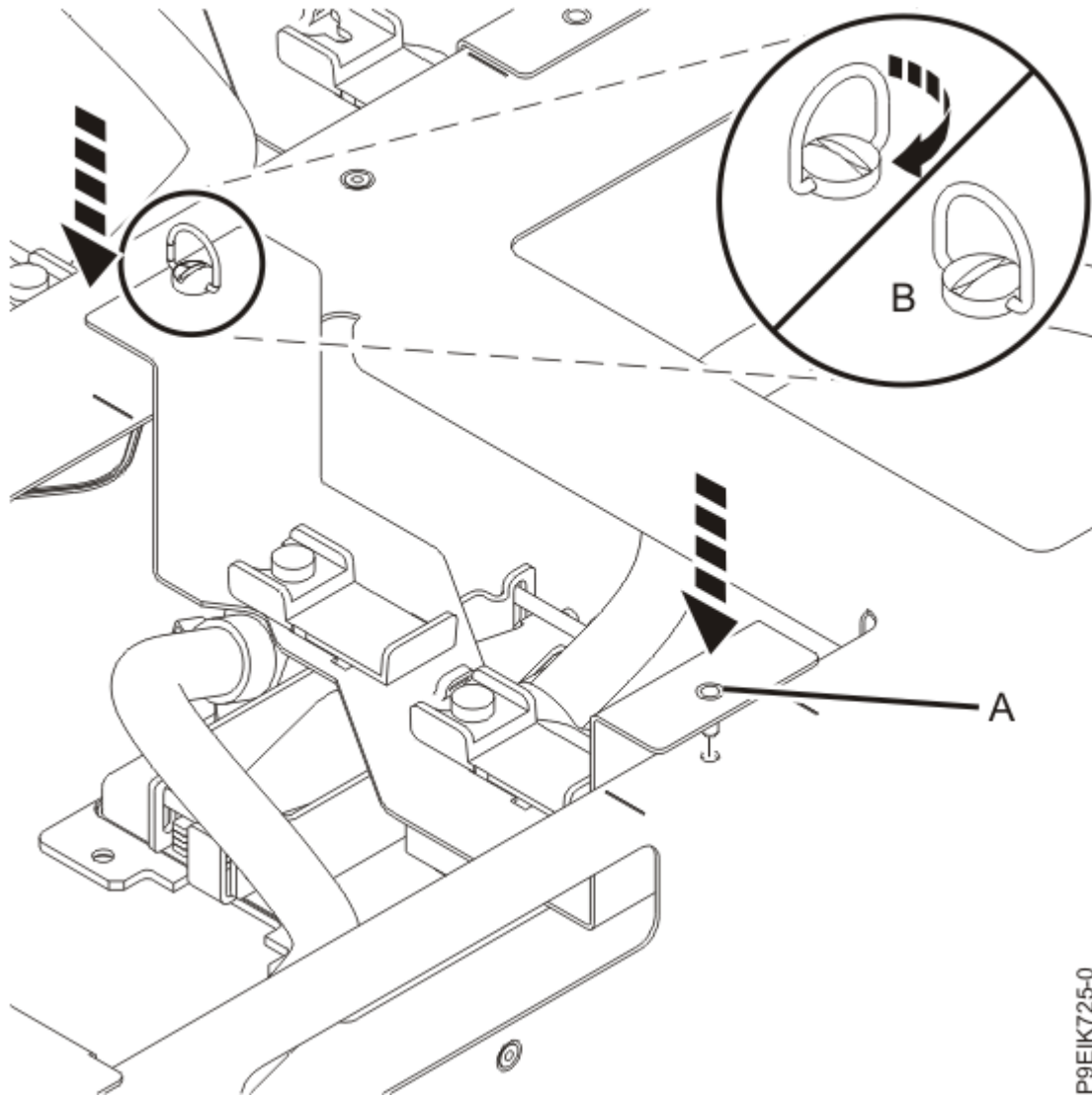
- a) Lift the coldplate straight up from the processor. Insert the cold plate pins (**A**) into the holder as shown in [Figure 39](#) on page 42.



P9EIK724-0

Figure 39. Inserting the cold plate pins into the holder

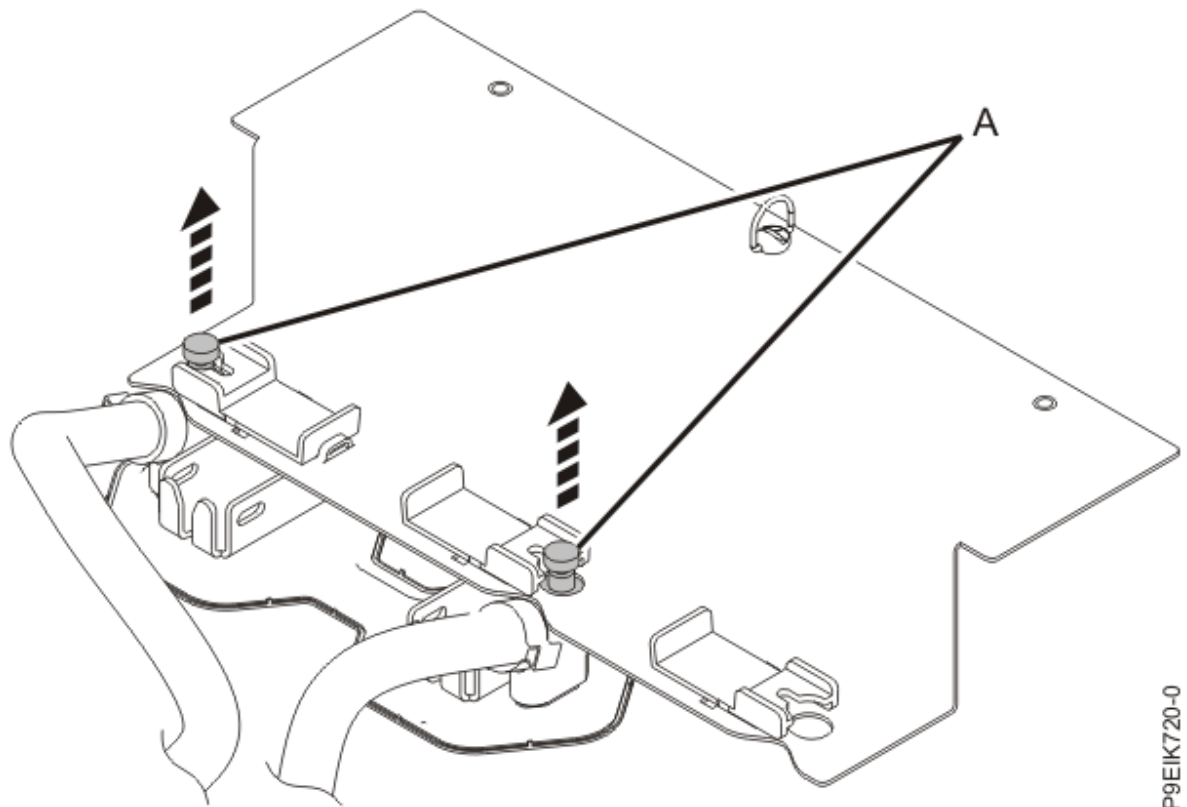
- b) Carefully slide both of the plastic latches **(A)** into the narrowest part of the pin.
- c) Fasten the processor cold plate holder to the cold plate installation carrier. Use the alignment pin **(A)** and tighten the screw **(B)** to secure the holder to the carrier.



P9EIK725-0

Figure 40. Placing the processor holder back onto the carrier

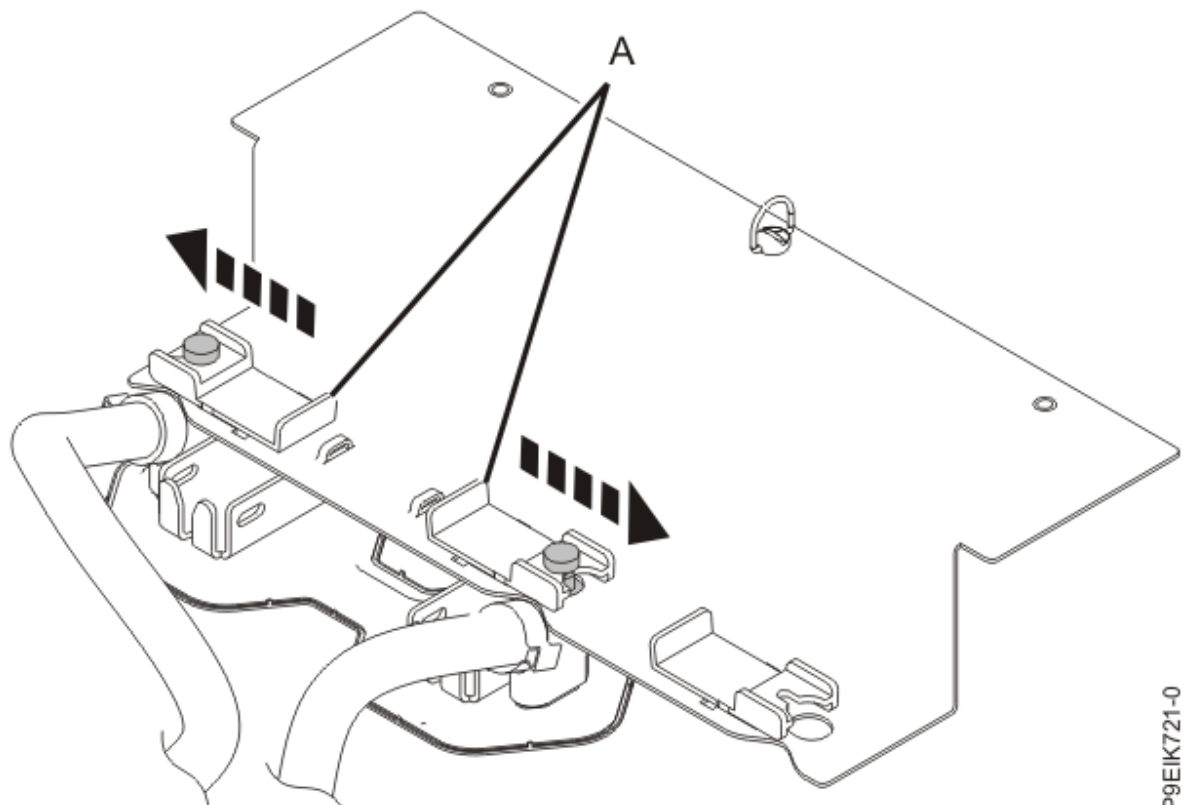
- d) Repeat step “10” on page 41 for each cold plate.
11. Attach the GPU cold plates to the holder.
- a) Insert the cold plate pins **(A)** into the holder as shown in [Figure 41 on page 44](#).



P9EIK720-0

Figure 41. Inserting the GPU cold plate pins into the holder

- b) Slide both of the plastic latches **(A)** into the narrowest part of the pin as shown in [Figure 42](#) on [page 44](#).



P9EIK721-0

Figure 42. Securing the GPU cold plate pins

- c) Repeat step [“11”](#) on [page 43](#) for each cold plate.

12. Fasten each GPU cold plate holder to the cold plate installation carrier as shown in [Figure 43](#) on page 45. Use the alignment pins **(A)** and tighten the screw **(B)** to secure the holder to the carrier.

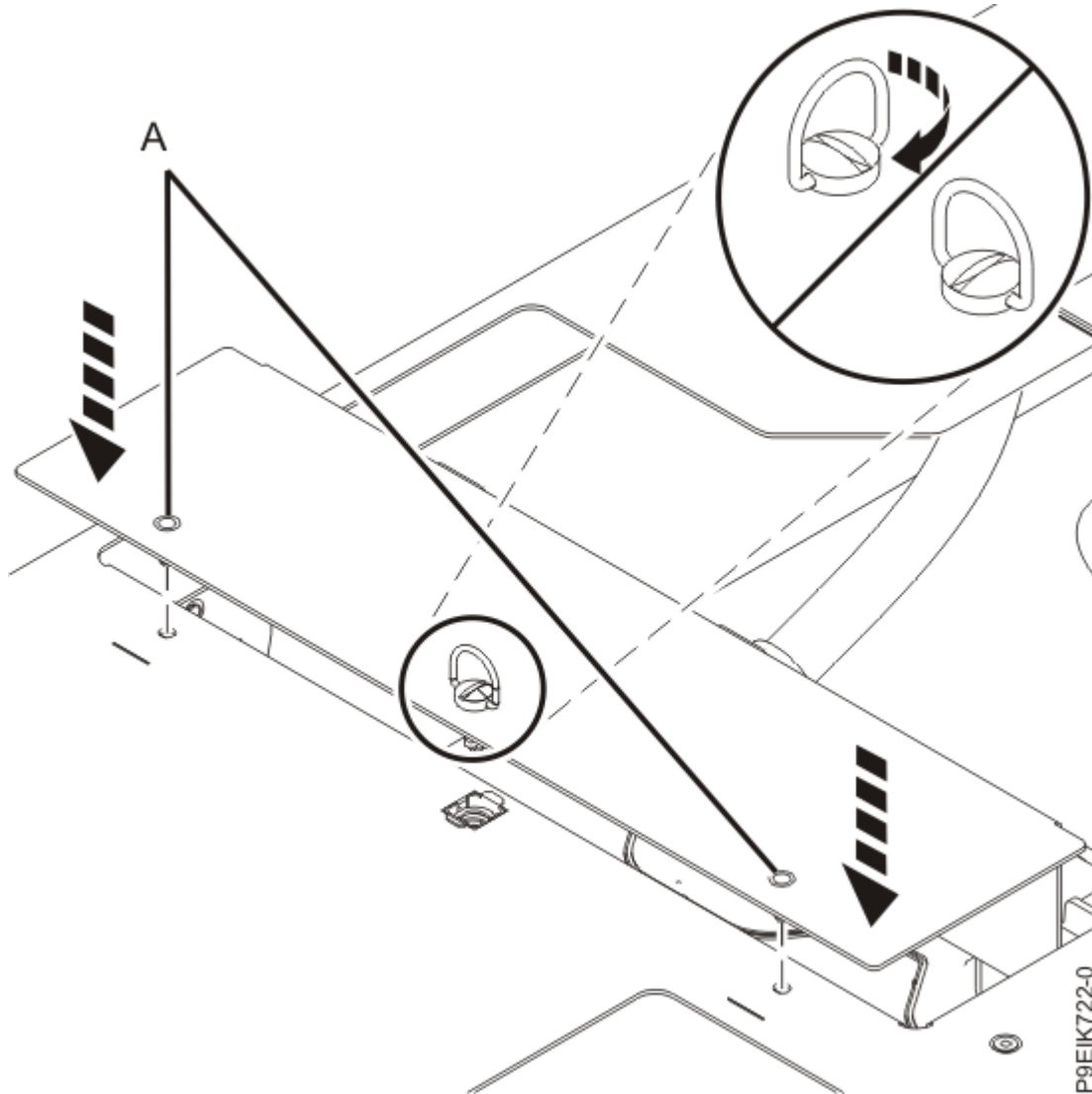


Figure 43. Placing the GPU holder back onto the carrier

What to do next

Next, complete the: [“Replacing the cold plates in the 8335-GTW or 8335-GTX system”](#) on page 45 procedure.

Replacing the cold plates in the 8335-GTW or 8335-GTX system

To replace the cold plates, complete the steps in this procedure.

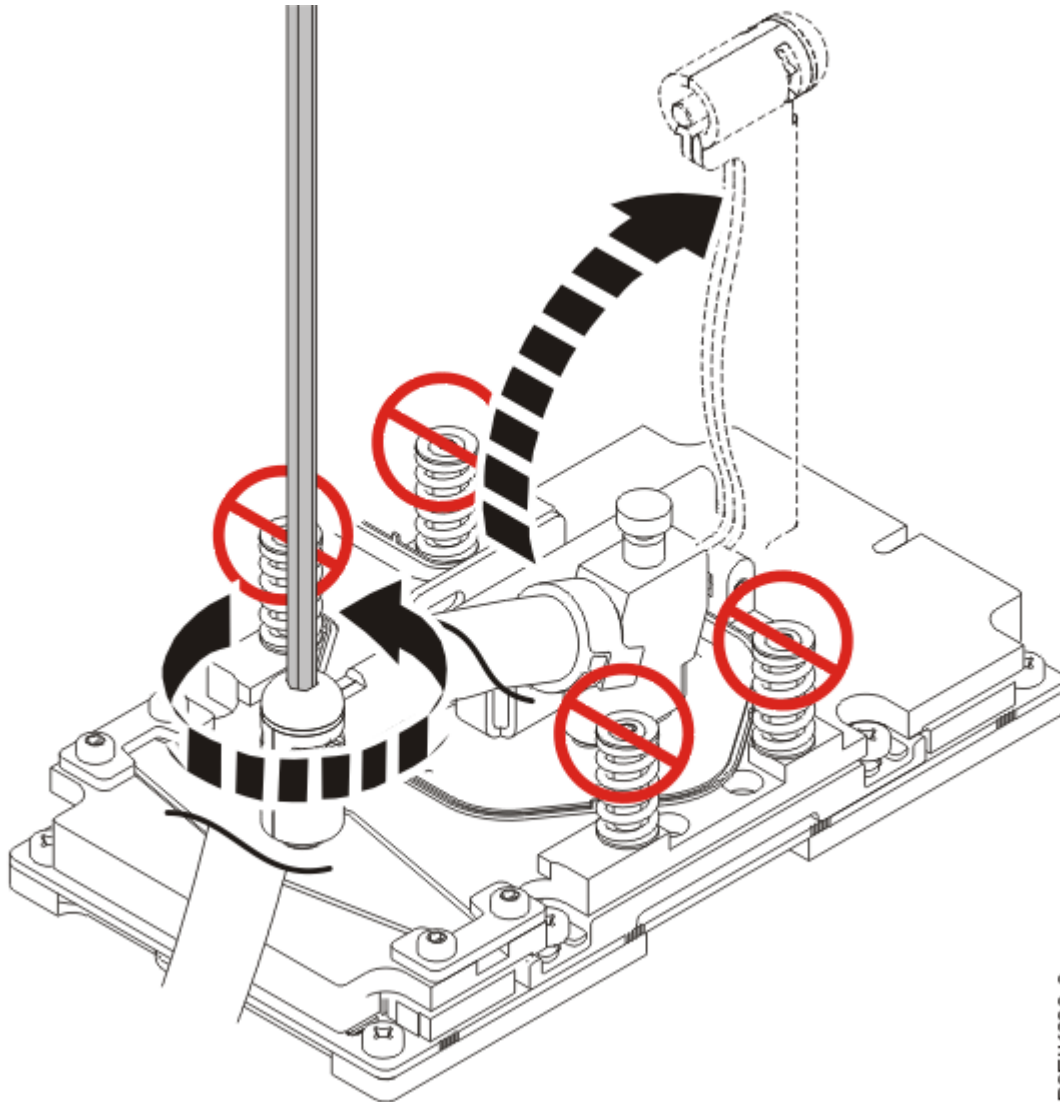
Before you begin

Ensure that you have enough TIMs for the GPUs and processors. Check the replacement part kit.

- The GPU TIM part number is 00E5133 and must be replaced.
- The processor TIM part number is 45D7426 and can be reused.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Ensure that each GPU clip is open as shown in [Figure 44](#) on page 46.



P9EIK630-0

Figure 44. Open the cold plate retainer

3. 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. If you see folds, tears, bends, or if you have doubts about the TIM, replace it.

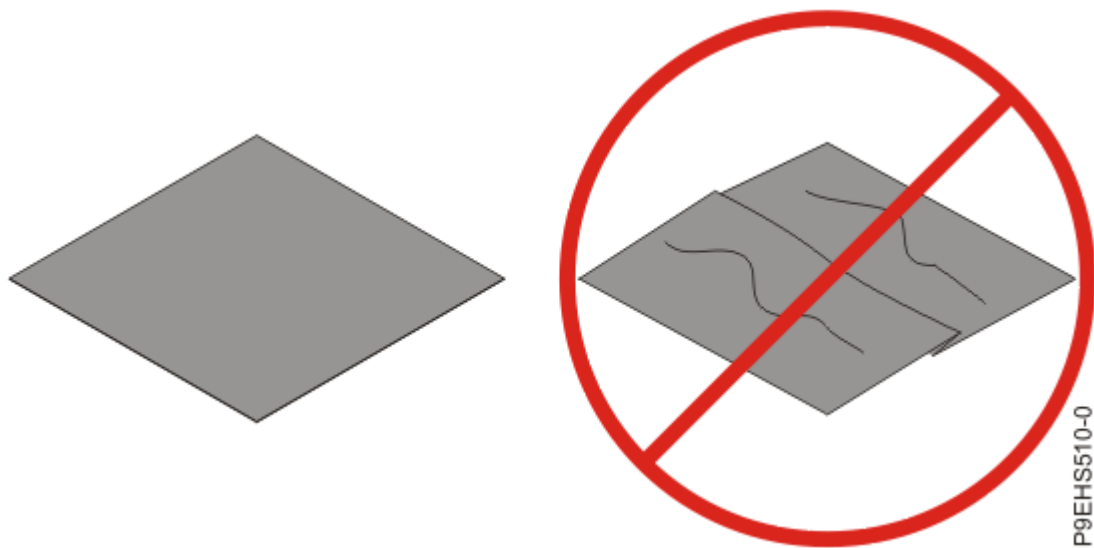
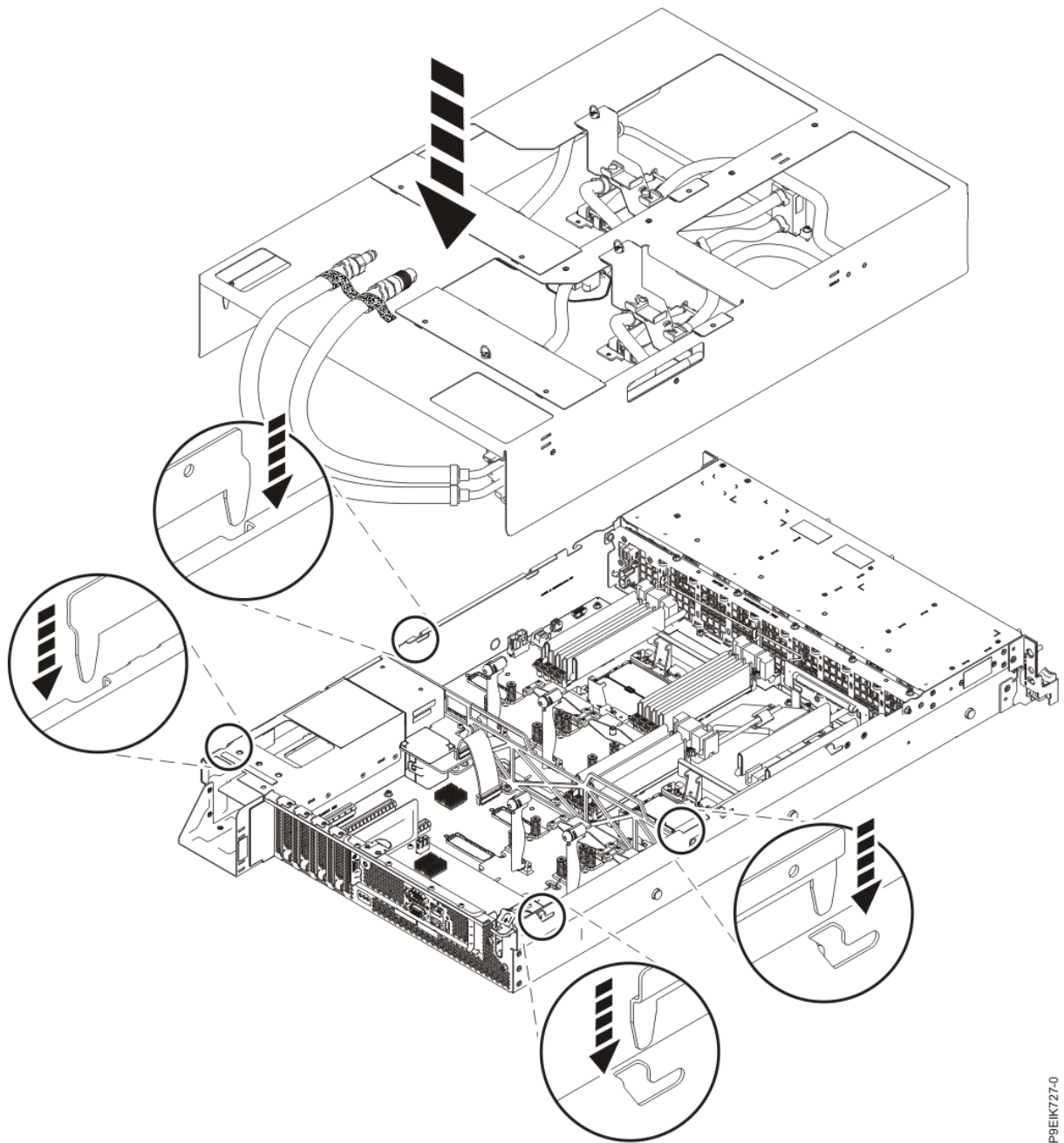


Figure 45. Inspecting the thermal interface material

4. Lower the cold plate installation carrier straight down onto the system as shown in [Figure 46 on page 48](#).

If you lower the carrier at an angle, the carrier catches on the cold plate clips.

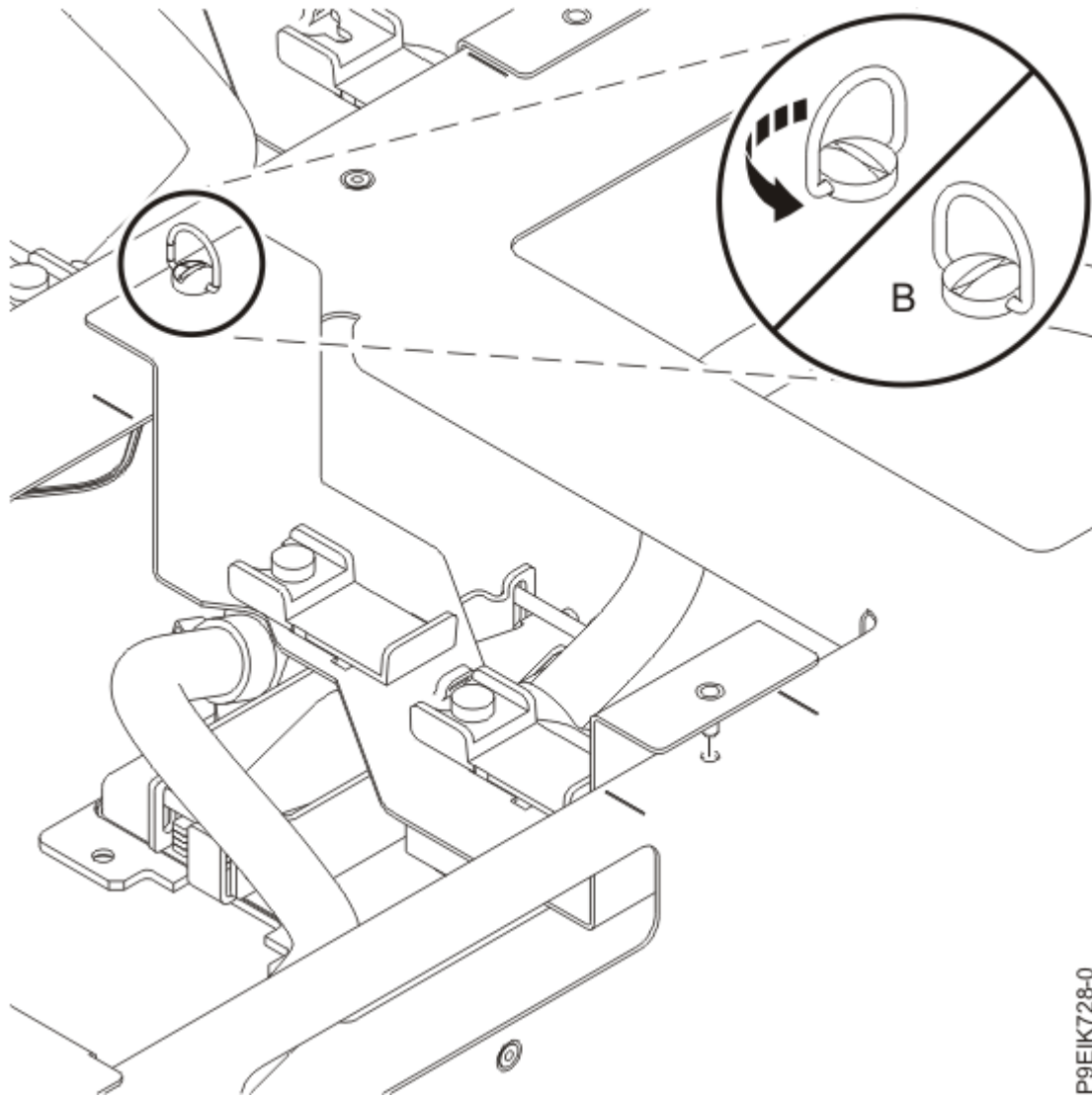


P9EIK727-0

Figure 46. Lowering the cold plate installation carrier onto the system

5. Replace the processor cold plates first.

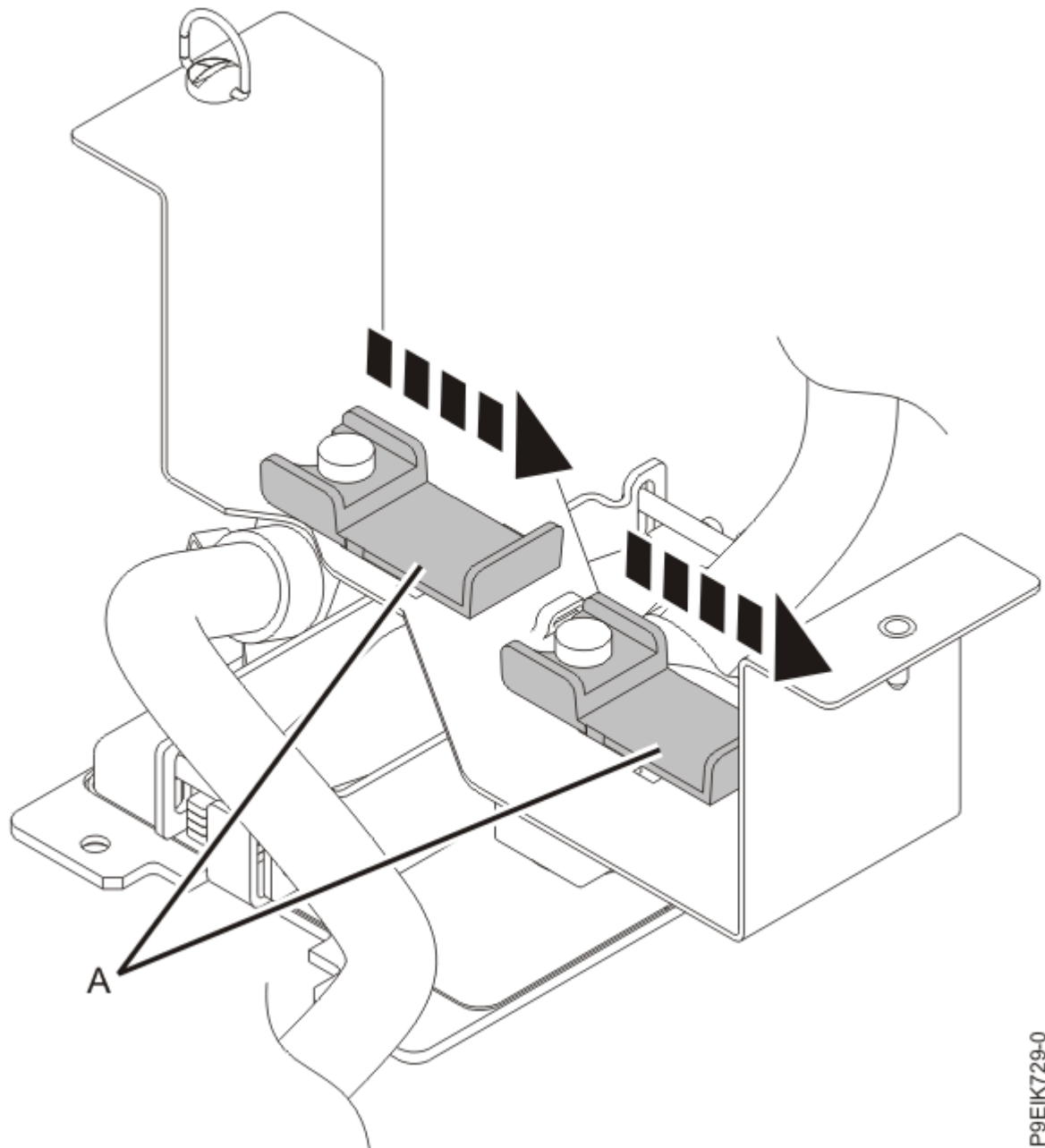
- a) Unscrew a processor cold plate holder from the cold plate installation carrier as shown in [Figure 47](#) on page 49.



P9EIK728-0

Figure 47. Removing the processor cold plate holder from the carrier

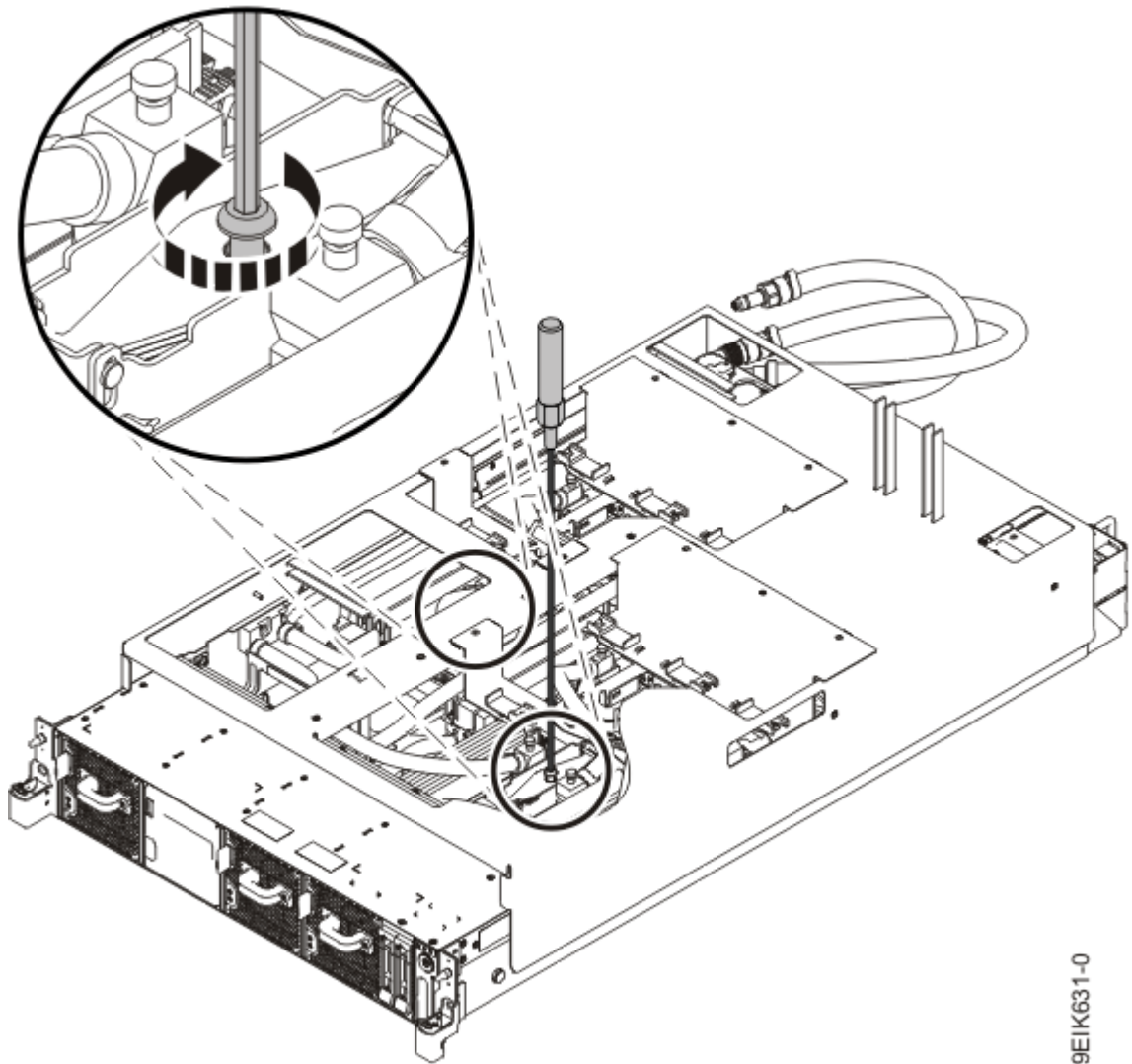
- b) Support the cold plate from underneath and carefully slide both of the plastic latches **(A)** to free the pins from the holder as shown in [Figure 48](#) on page 50.



P9EIK729-0

Figure 48. Removing the processor cold plate pins from the holder

- c) Check that the processor TIM is squarely placed on the processor.
- d) Lower the cold plate onto the processor and TIM while carefully aligning the cold plate guide holes with the pins on the processor socket.
Keep applying light pressure downward on the cold plate to ensure that the cold plate and the processor do not move.
- e) Maintain the downward pressure and tighten the cold plate retainer screw with the supplied hex key to secure the cold plate to the processor module as shown in [Figure 49 on page 51](#).



P9EIK631-0

Figure 49. Tightening the cold plate retainer screw

Repeat step [“5”](#) on page 48 for the other processor.

6. Replace the GPU cold plates next.

a) Check that the new GPU TIMs are squarely placed on the GPUs as shown in [Figure 50](#) on page [52](#).

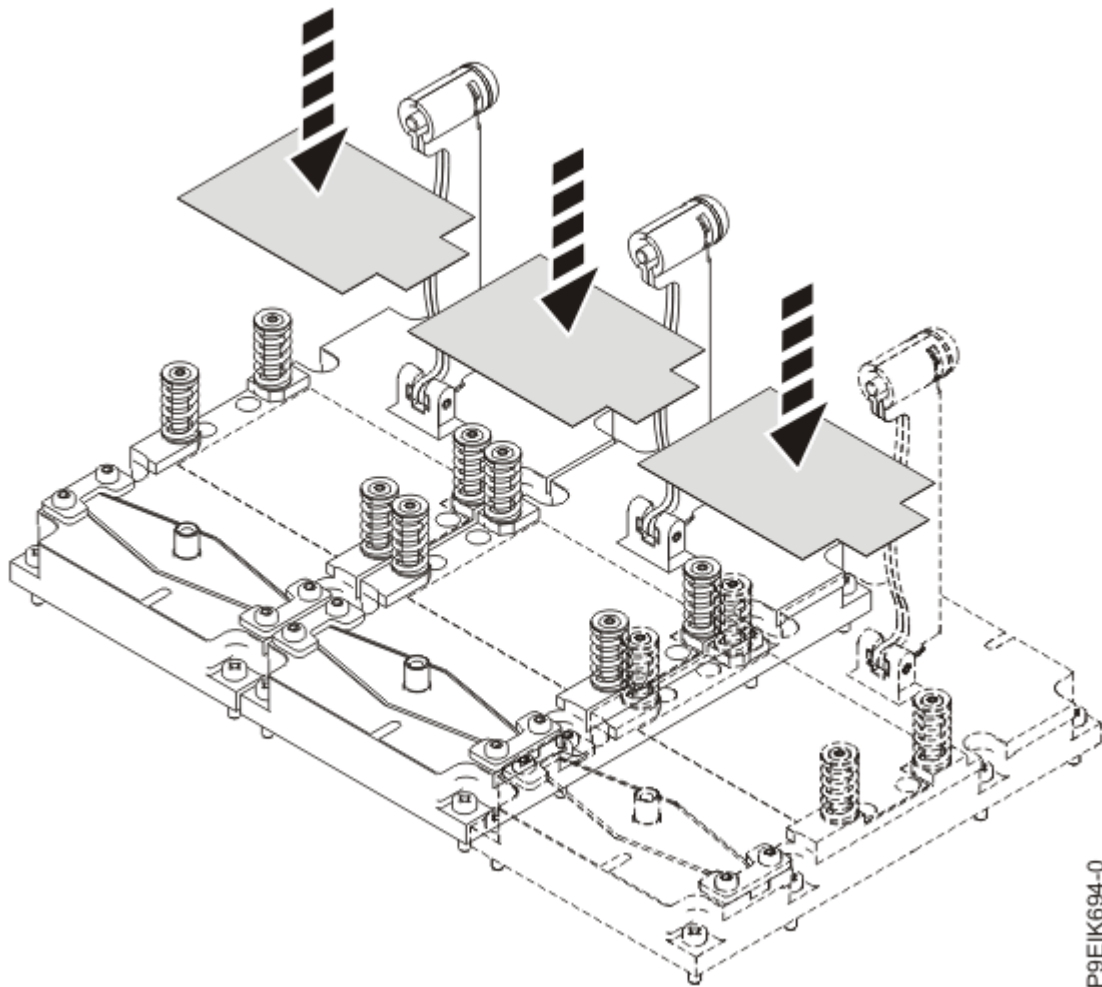


Figure 50. Installing GPU TIMs

- b) Unscrew a GPU cold plate holder from the cold plate installation carrier as shown in [Figure 51](#) on [page 53](#).

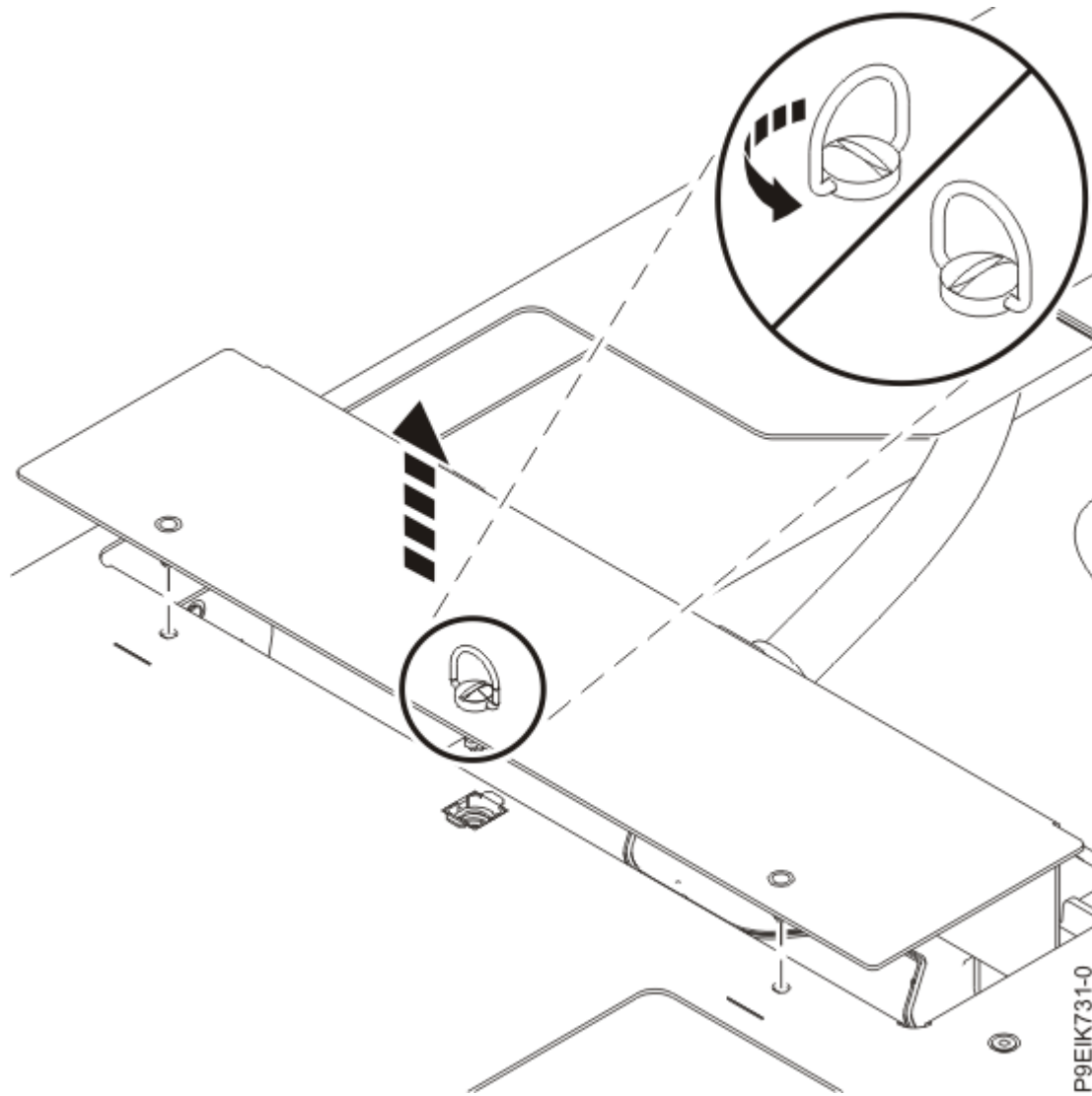
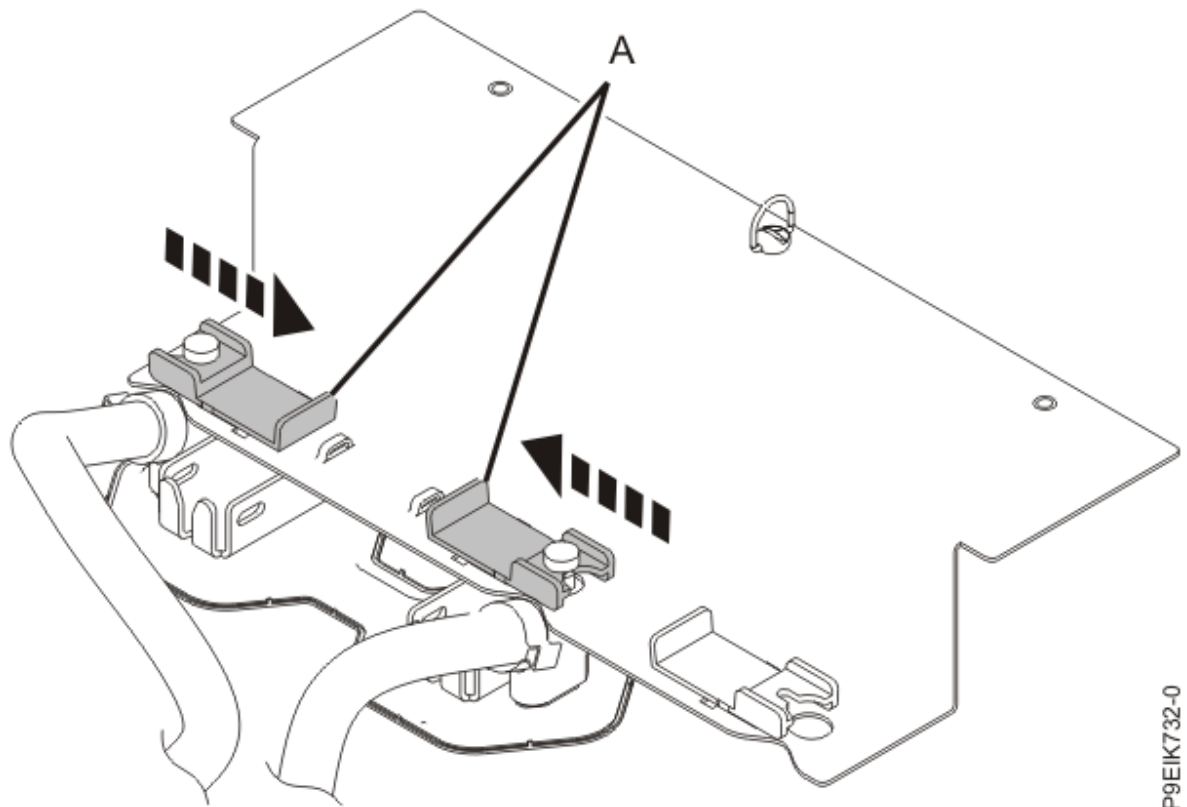


Figure 51. Removing the GPU cold plate holder from the carrier

- c) Support the cold plate from underneath and carefully slide both of the plastic latches **(A)** to free the pins from the holder as shown in [Figure 52 on page 54](#).



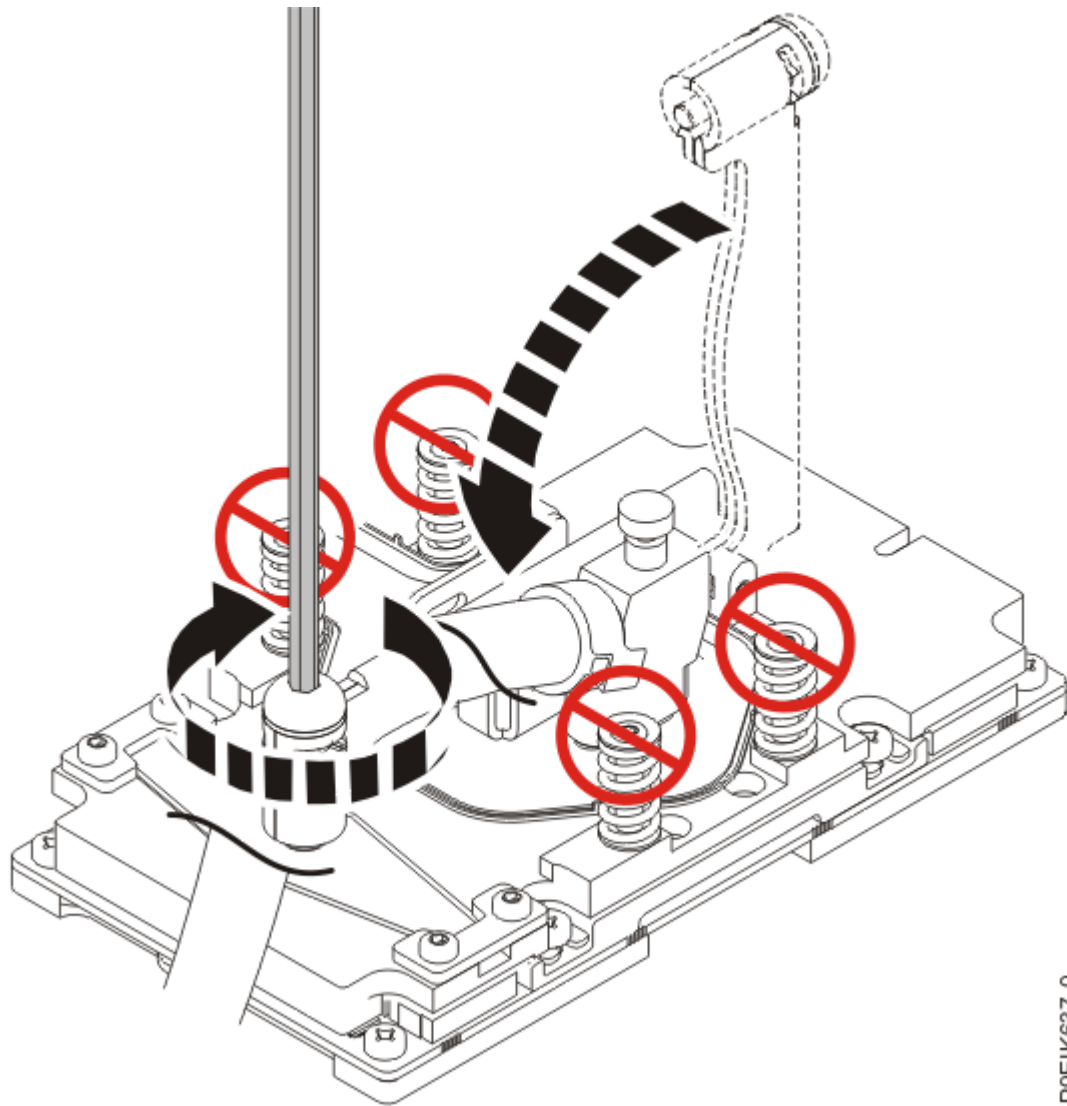
P9EIK732-0

Figure 52. Removing the GPU cold plate from the holder

d) Place the cold plate onto the GPUs.

e) Secure the middle GPU first. Swing the retainer over the GPU and tighten the cold plate retainer screw as shown in [Figure 53](#) on page 55.

Repeat with the remaining clips until the GPU cold plate is secure.



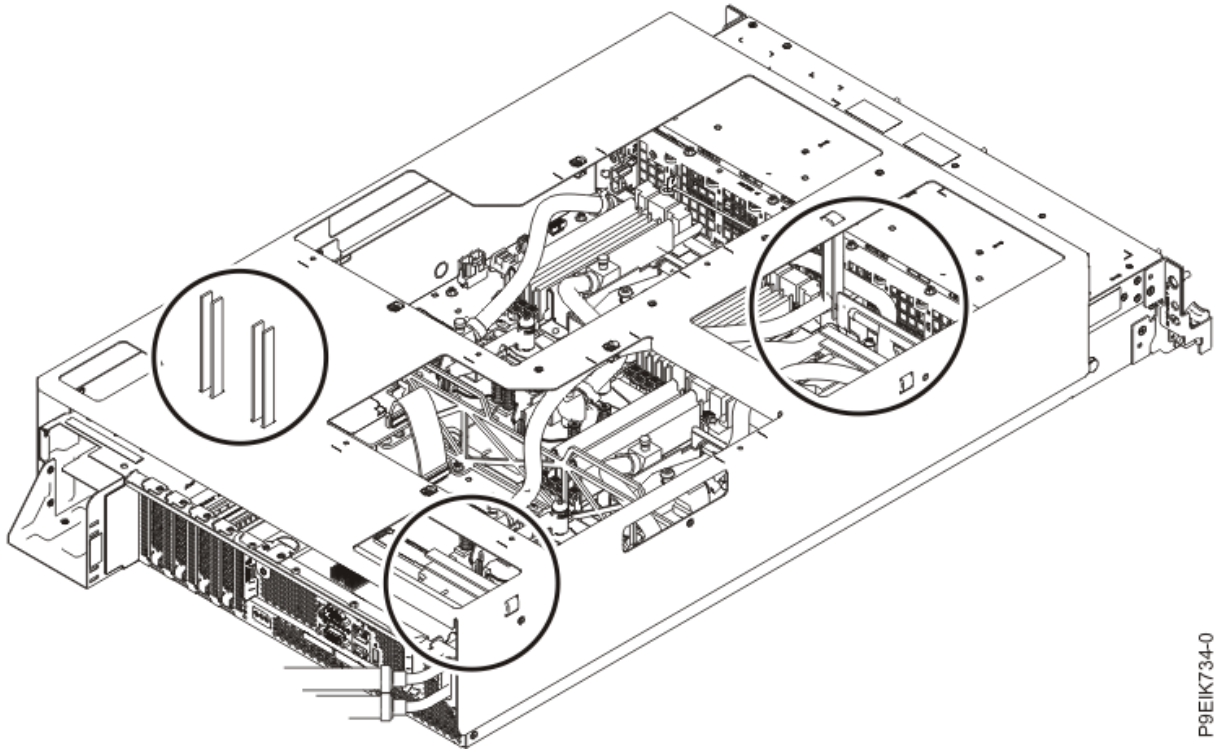
P9EIK637-0

Figure 53. Secure the cold plate retainer screw

Repeat step [“6”](#) on page 51 for the other GPU cold plate.

7. Unfasten all the hook-and-loop fasteners on the cold plate installation carrier as shown in [Figure 54](#) on page 56.

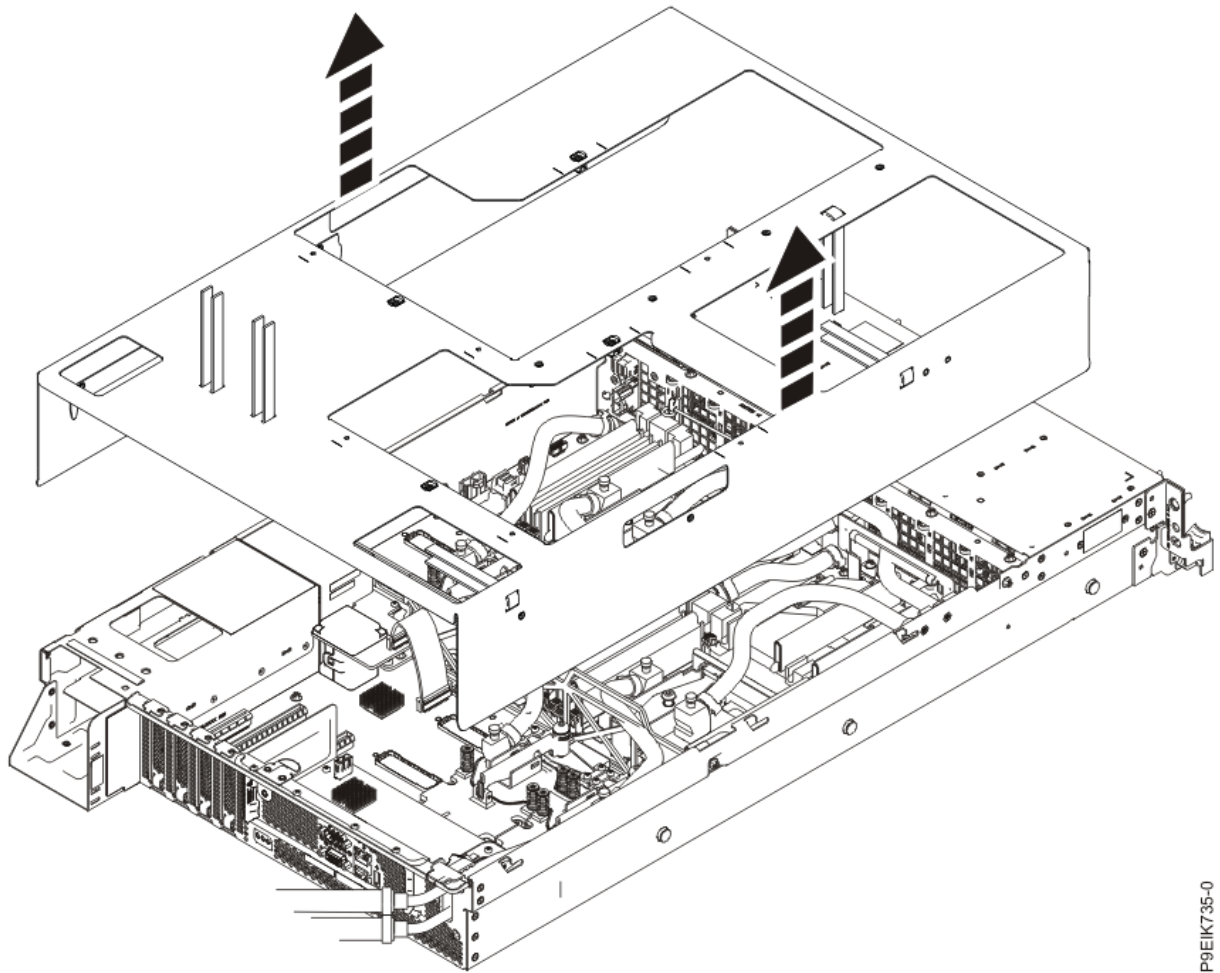
Ensure that all the water pipes are released from the holder.



P9EIK734-0

Figure 54. Unfastening the water hoses from the carrier

8. Lift the cold plate installation carrier straight up off the system as shown in [Figure 55 on page 57](#).



P9EIK7 35-0

Figure 55. Lifting the cold plate installation carrier

9. Replace the front pipe **(B)**. Use the alignment pin **(C)** to position the front pipe. Tighten the screw **(A)** that secures the pipe **(B)** to the front of the system as shown in [Figure 56 on page 58](#).

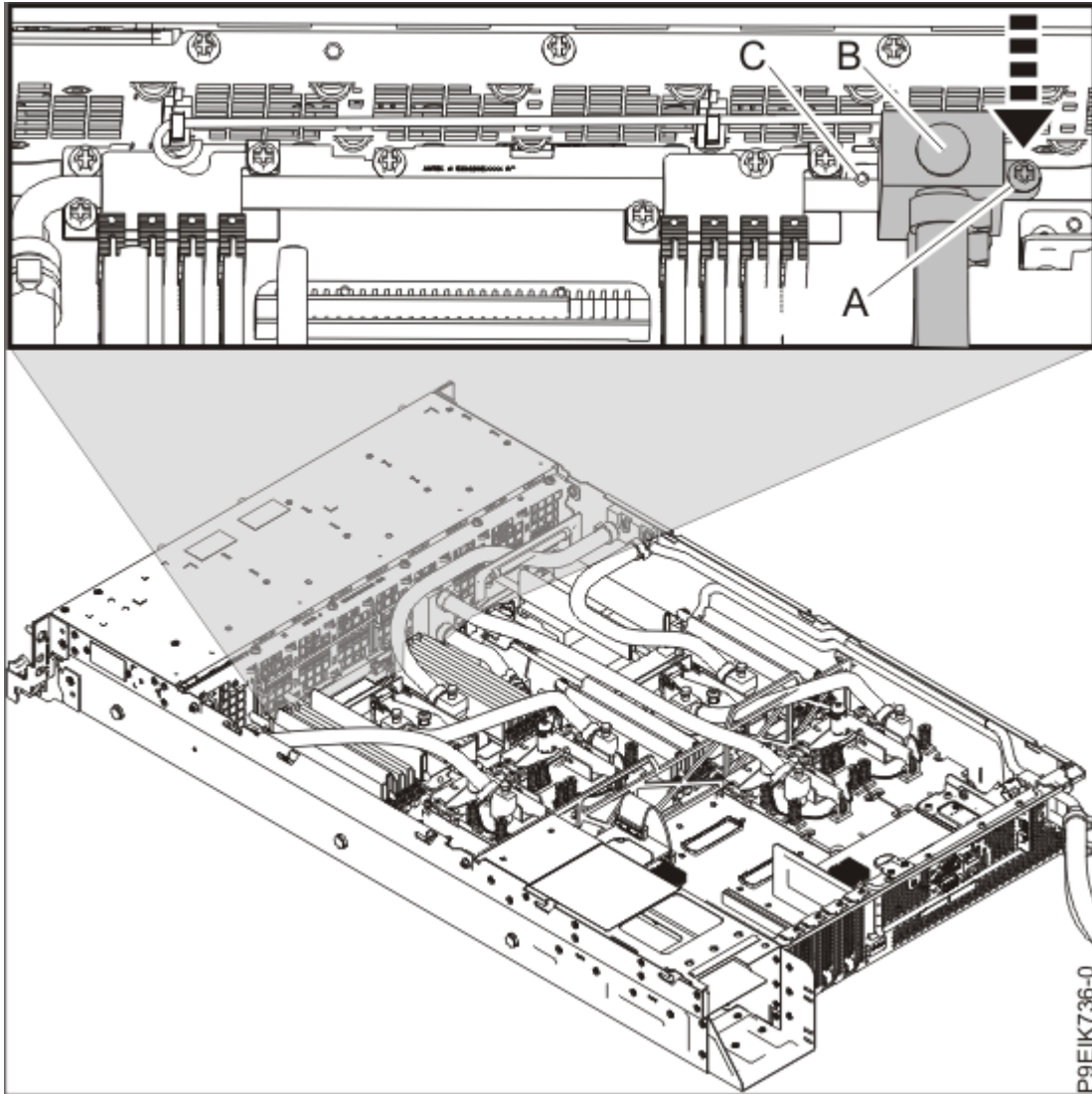


Figure 56. Replacing the front pipe screw

10. Replace the two pipe holders **(A)** near the front of the system as shown in [Figure 57](#) on page 59. Place the pipes in the supports on the system backplane, place the holders over the supports and the pipes, align the screw threads at **(B)**, and tighten the four screws.

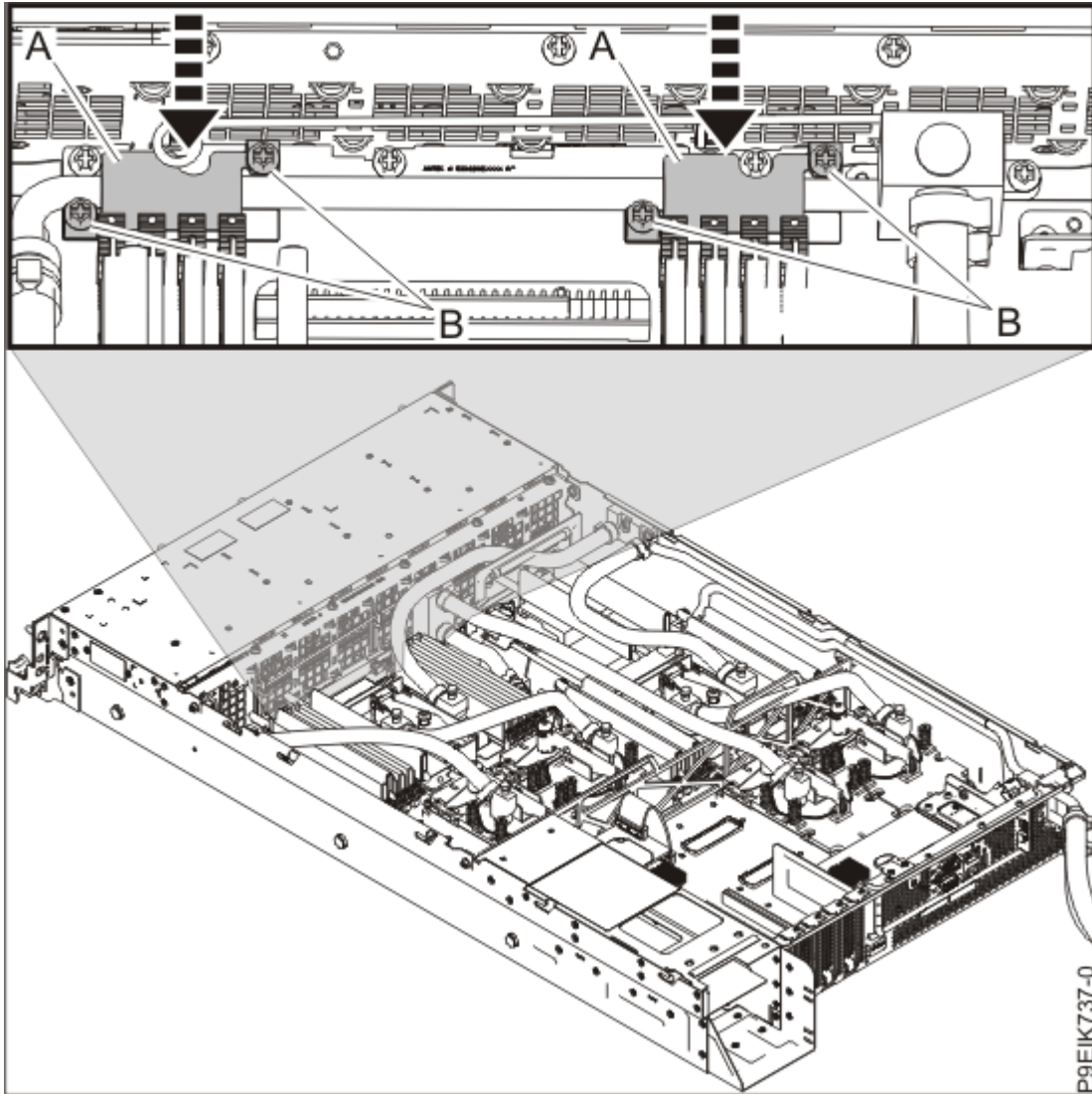


Figure 57. Replacing the front pipe holders

11. Replace the side pipes into the side of the chassis as shown in [Figure 58](#) on page 60. Ensure the rear of the pipe slides into its position. Ensure that the alignment pin at the front of the side pipe is in the pipe junction.

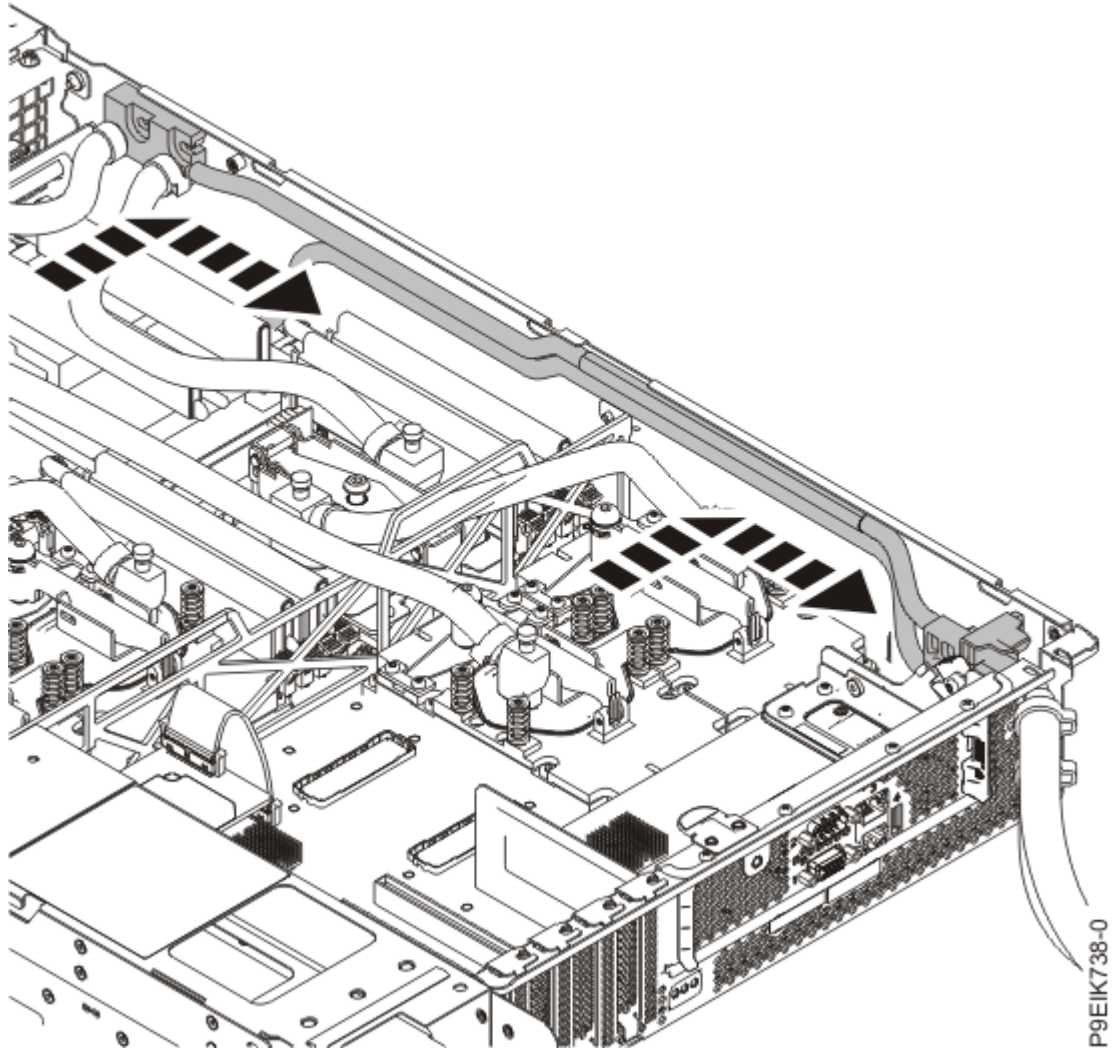


Figure 58. Inserting the side pipes

12. Replace the two pipe holders **(A)** near the middle of the system as shown in [Figure 59](#) on page 61. Place the pipes in the supports on the system backplane, place the holders over the supports and the pipes, align the screw threads at **(B)**, and tighten the four screws.

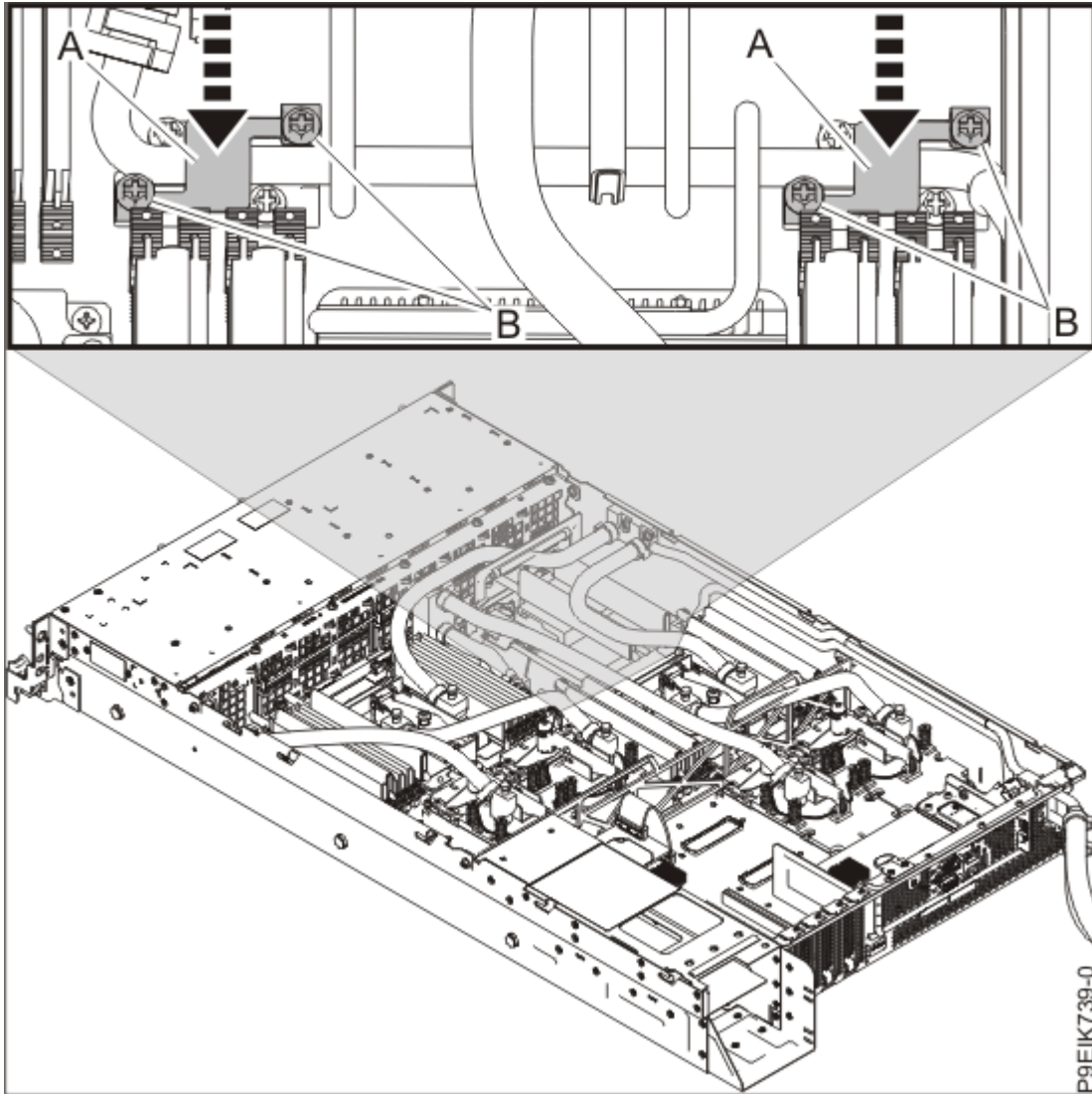


Figure 59. Replacing the middle pipe holders

13. Replace the three screws **(A)** that secure the water hoses to the rear of the system as shown in [Figure 60](#) on page 62.

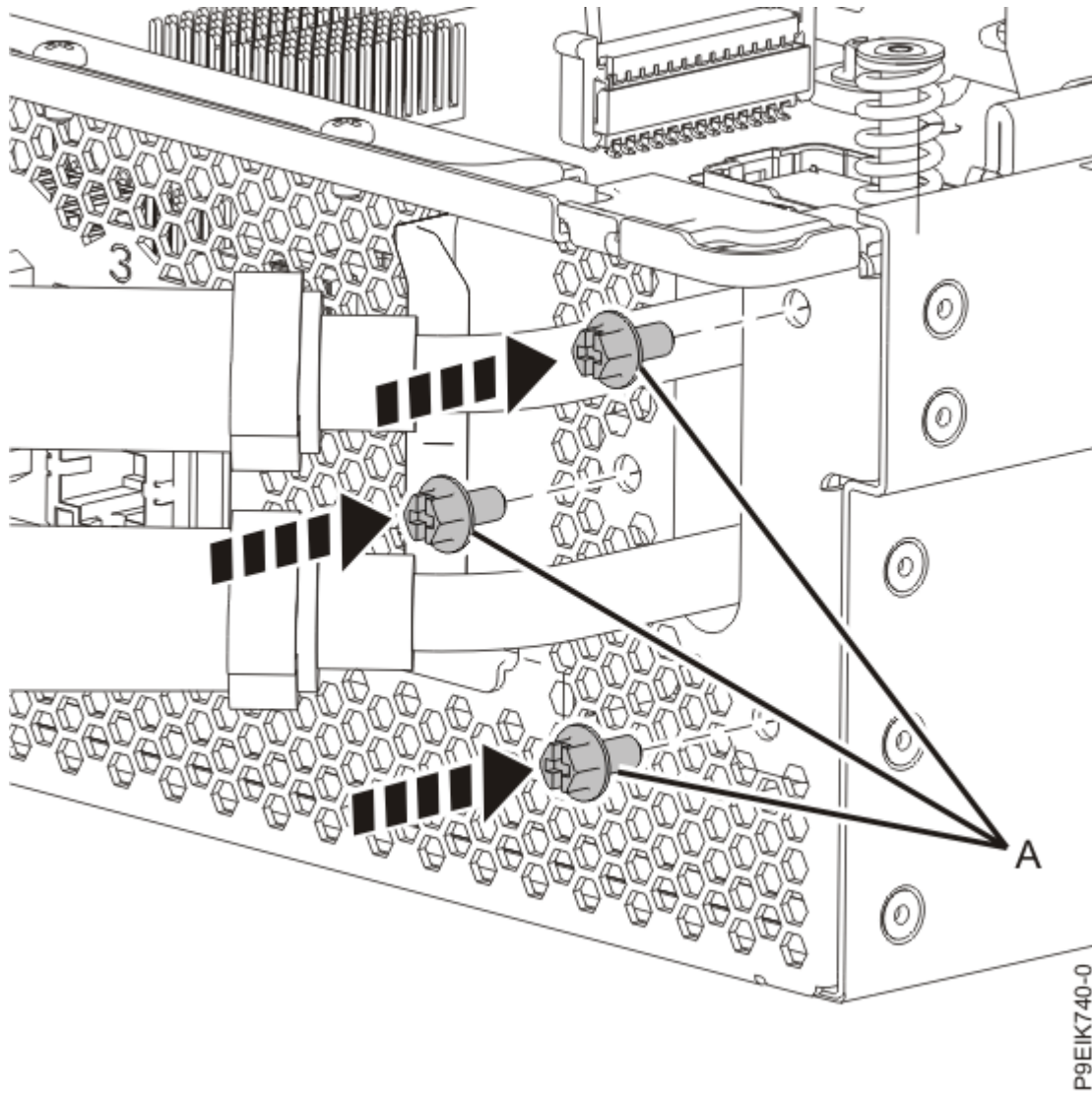
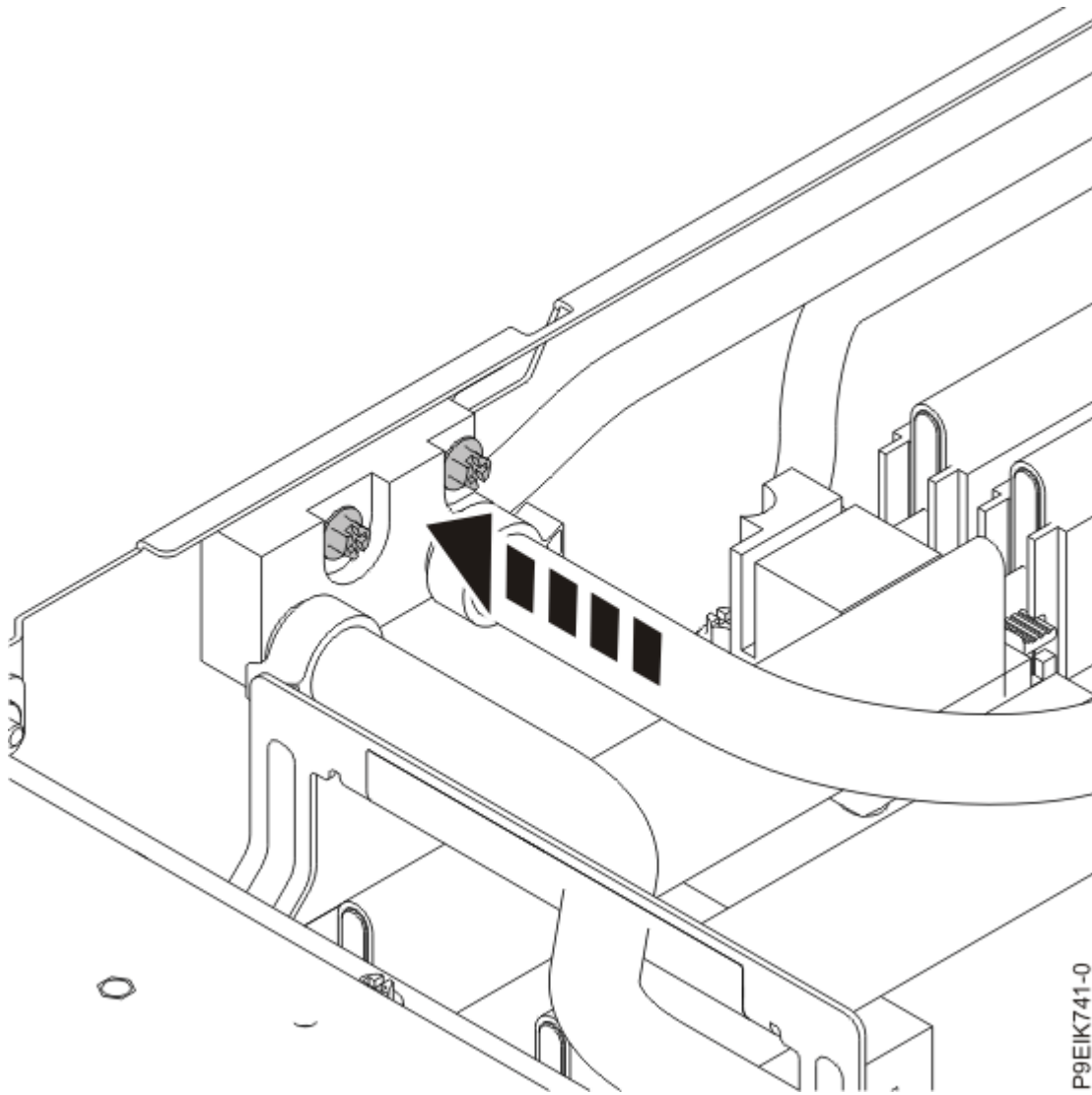


Figure 60. Replacing the rear water hose screws

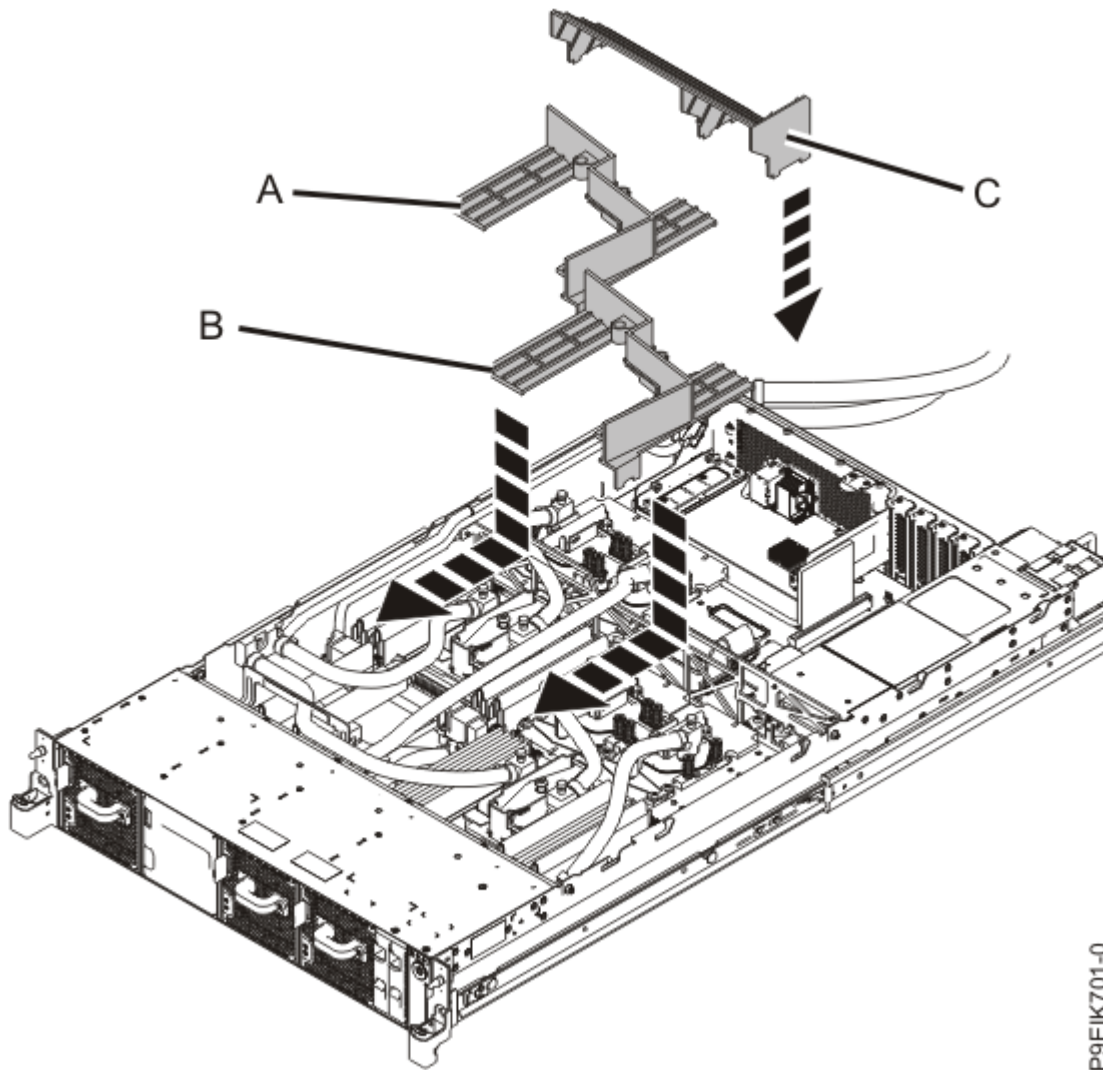
14. Replace the two screws that secure the pipes to the left side of the chassis as shown in [Figure 61](#) on [page 63](#).



P9EIK741-0

Figure 61. Replacing the screws for the side water pipe bracket

15. Replace the air baffles **(A)**, **(B)**, and **(C)** as shown in [Figure 62](#) on page 64.
The baffles go straight down; you might need to maneuver them around the hoses.



P9EIK701-0

Figure 62. Replacing the air baffles

16. Replace each cold plate holder in the cold plate installation carrier.

Use the alignment pins on the holder, and tighten each holder with its retaining screw. Close the loops on all the hook and loop fasteners to ensure that they do not come loose from the cold plate installation carrier.

What to do next

Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Removing and replacing a disk drive in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn how to remove and replace a disk drive in the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

About this task

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

Removing a disk drive from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove a disk drive, complete the steps in this procedure.

Procedure

1. Remove the front cover. For instructions, see “Removing the front cover from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 226.

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
3. Locate the faulty drive. The amber drive LED is turned on when a drive has an issue.

If a drive's amber LED is lit, go to step “4” on page 66.

If a drive has an issue and if the amber LED is not lit, use the following procedure to locate the drive. Run the following commands from an operating system command window.

- a) Determine the drive that must be replaced as indicated 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 remove this drive when the system powered on unless the sda drive is part of a RAID configuration. If the drive that contains the operating system needs to be removed, and that drive is not part of a RAID array, you must first power off the system before removing that drive.

- b) Gather the physical serial number of the identified drive by running the following hdparm command, where sdX is the drive to replace:

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

The hdparm command is in the hdparm package; install the package if you have not installed it already.

```
apt-get install hdparm
```

Or:

```
yum install hdparm
```

- c) Run the following command to identify the physical drive, where sdX is the drive to replace: The command causes the green LED on the drive to flash.

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

You can also use the optional `usysident` package to turn on or turn off the amber LED. Run the following command to turn on the amber LED:

```
usysident -d sdX -s identify
```

Run the following command to turn off the amber LED:

```
usysident -d sdX -s normal
```

d) To prepare the drive for removal, disable it by running the following command, where `sdX` is the drive to replace.

```
echo 0 >/sys/block/sdX/device/delete
```

e) Verify that you disabled the write operation on the drive by using the `ls SCSI` command. When the drive is disabled, the drive no longer appears in the output.

```
ls SCSI
```

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 63](#) on page 66.

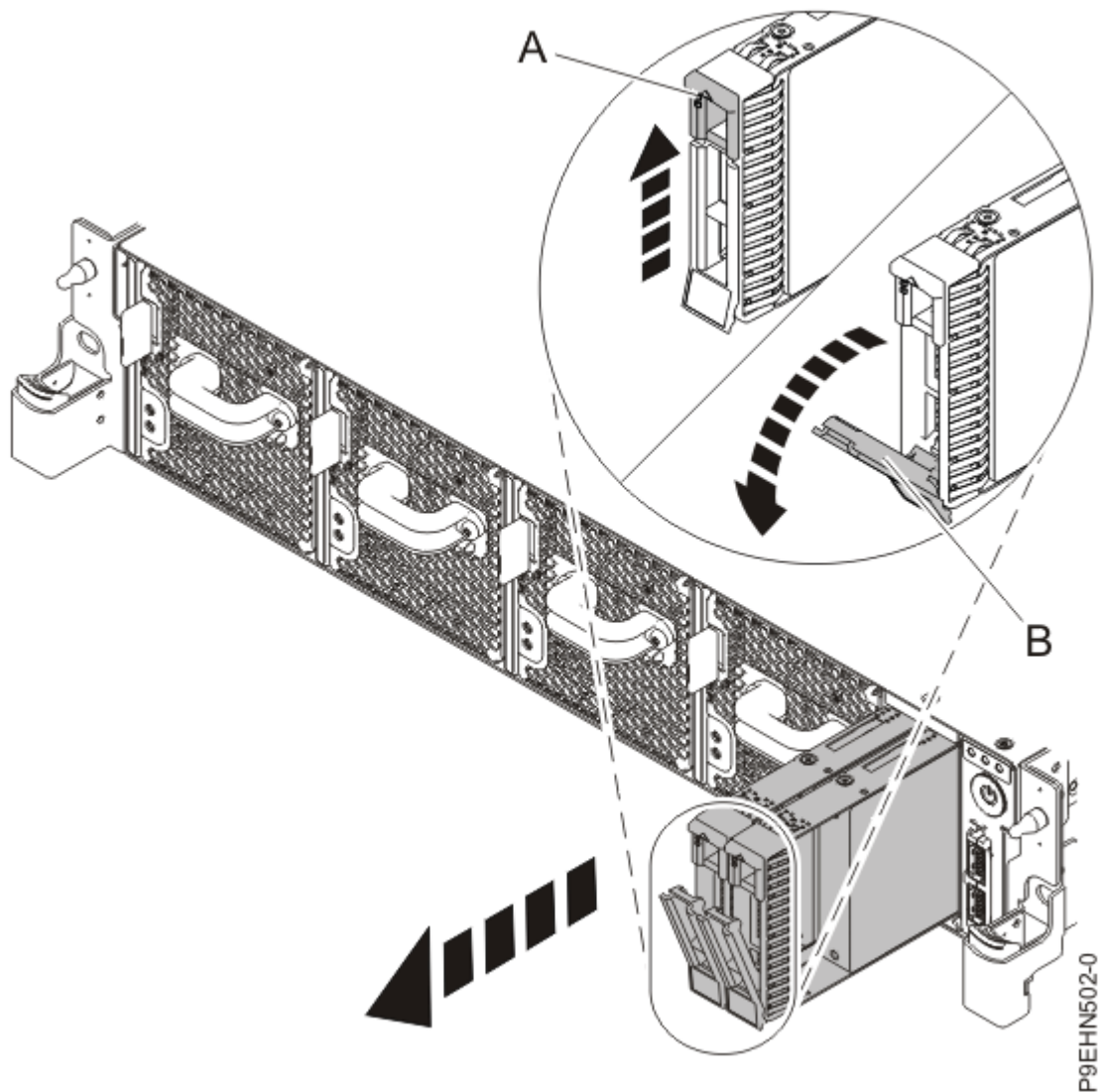


Figure 63. Disk drive lock detail

5. Support the bottom of the disk drive as you slide it out of the system. Do not hold the disk 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 in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace a disk drive, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Hold the disk drive by the top and bottom edges as you position the disk drive, and insert it into the disk drive slot.

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

3. Lock the disk drive bay handle (**A**) by pushing in the handle release.

See [Figure 64 on page 67](#).

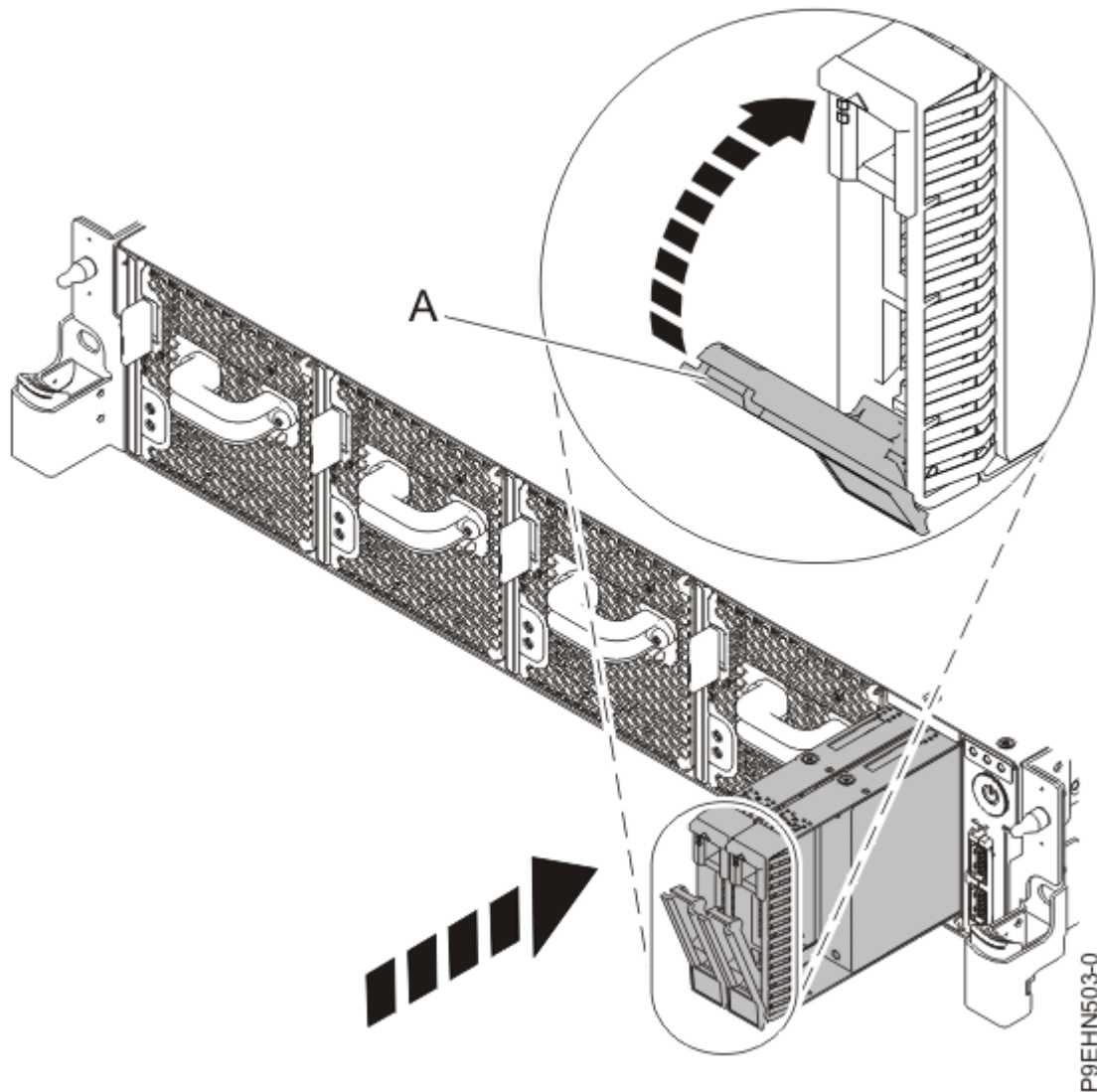


Figure 64. Disk drive lock detail

4. Configure the installed disk drive for your environment.

After you insert the new disk drive, you must scan for the device. Choose one of the following options depending on the operating system that you are using:

- **Ubuntu Linux operating system:**

Ubuntu can automatically detect storage devices. You may not need to rescan the disk drives; proceed to verifying that the new disk drive is active.

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):** To run the rescan command in the RHEL 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) (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 by running the following command:

```
ls SCSI
```

5. Load or restore data from your backup media.

Removing and replacing the disk drive and fan card in the 8335-GTW or 8335-GTX system

Learn how to remove and replace the disk drive and fan card in the system.

Removing the disk drive and fan card from the 8335-GTW or 8335-GTX system

To remove a disk drive and fan card, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

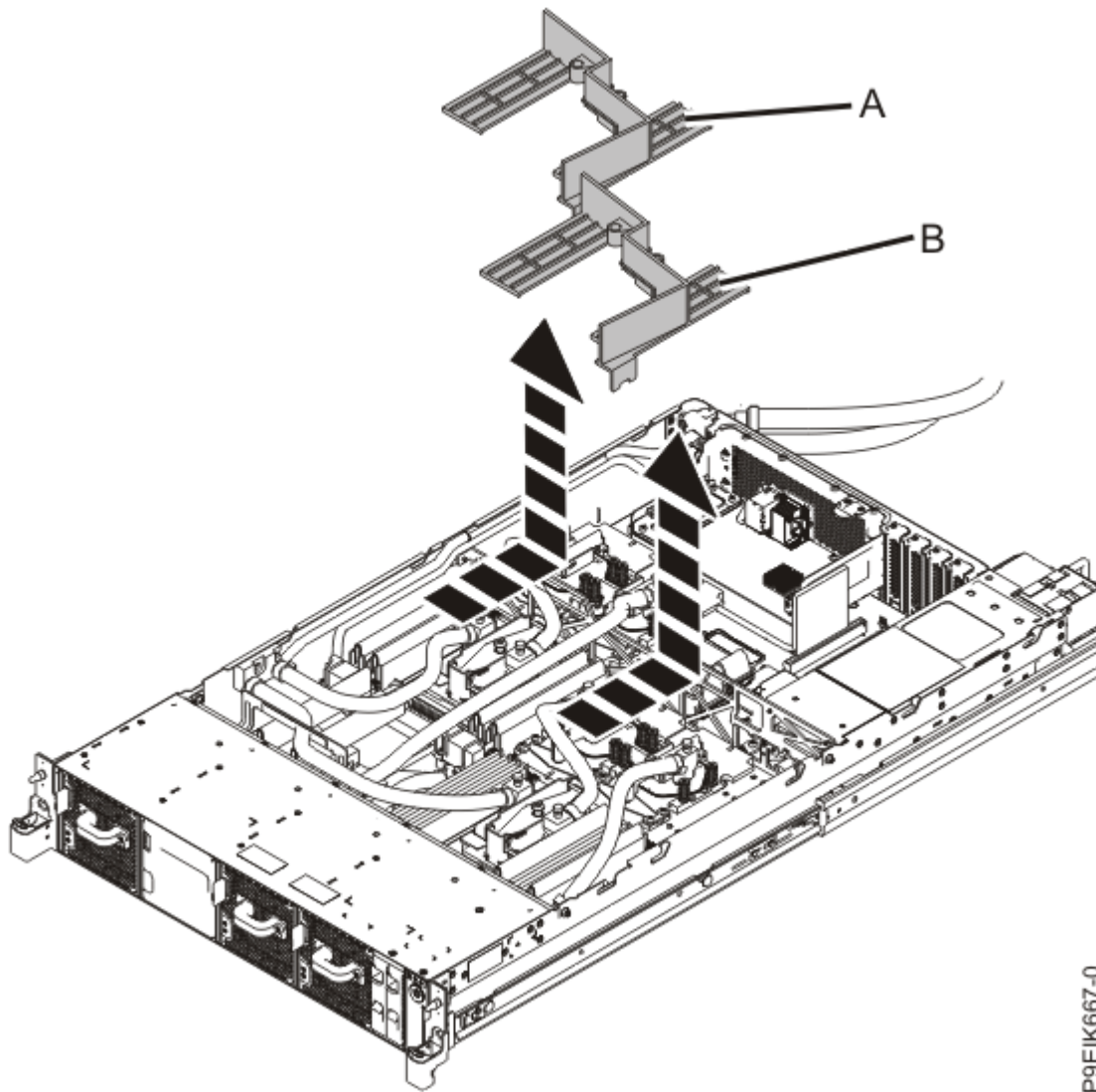
Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.

**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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Label and remove the fan power cable from the disk drive and fan card.
For instructions, see [“Removing the fan power cable from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 87.](#)
 3. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 81.](#)
 4. Unplug but do not remove the fans from their slots. Pull the fans out approximately 2.5 cm (1 in) to prevent them from interfering with the removal of the disk drive and fan card.
For instructions, see [“Removing a fan from the 8335-GTW or 8335-GTX system” on page 84.](#)
 5. Remove the air baffles **(A)** and **(B)** as shown in [Figure 65 on page 70.](#)
Carefully move the baffles around the hoses.



P9EIK667-0

Figure 65. Removing the memory air baffles

6. From the pipe bracket **(A)** near the front of the system as shown in [Figure 66 on page 71](#), remove the three screws **(B)** that secure the bracket to the system.

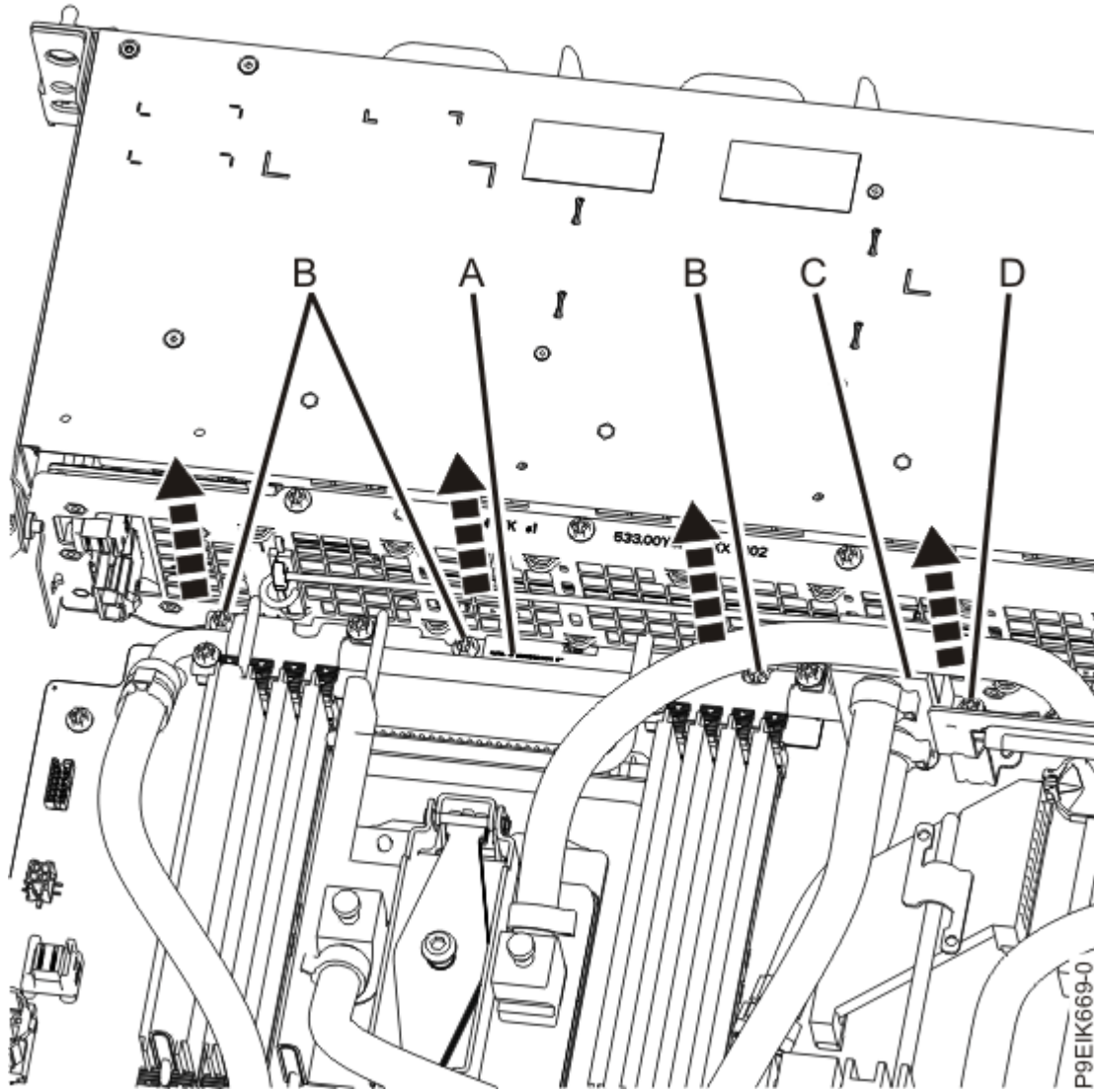


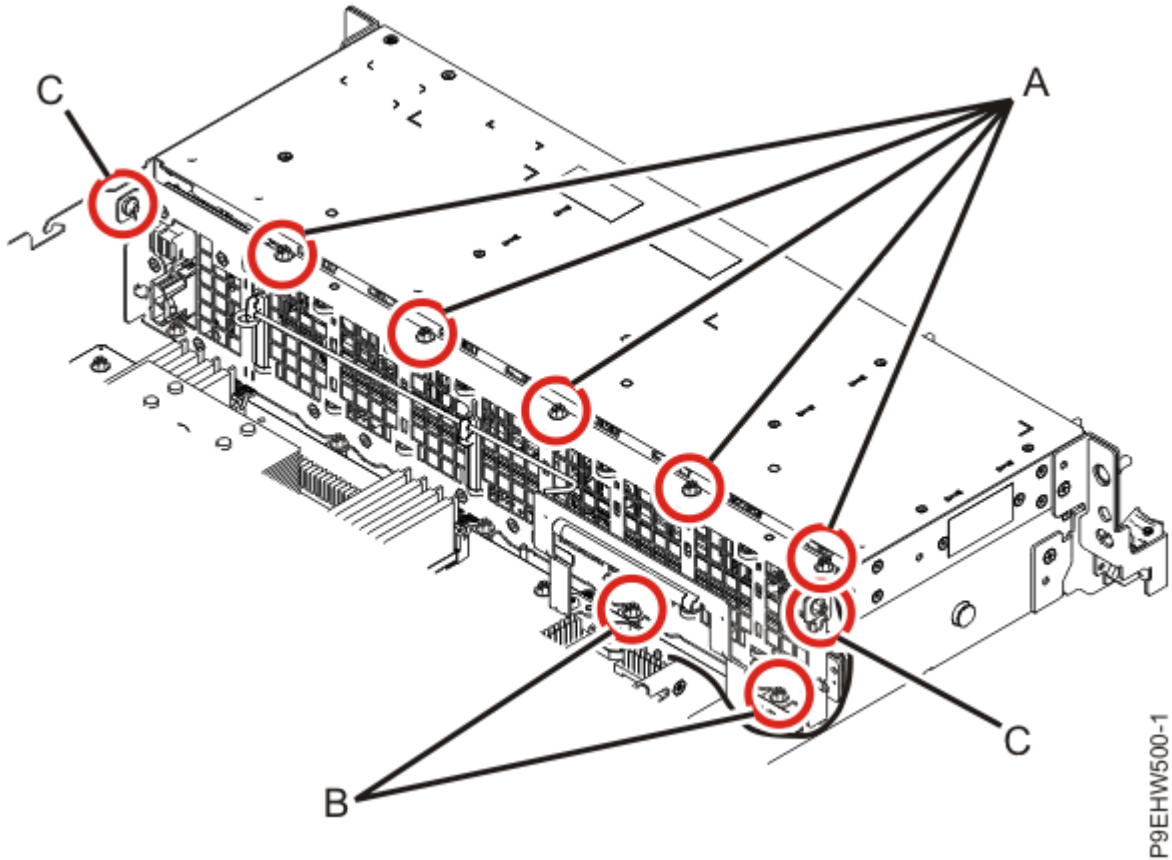
Figure 66. Removing the front pipe holder

7. From the water pipe at position **(C)**, loosen the screw **(D)** as shown in [Figure 66](#) on page 71.
8. Move the water pipe and holder away from the disk drive and fan card, toward the processor.



Figure 67. Moving the front pipe away

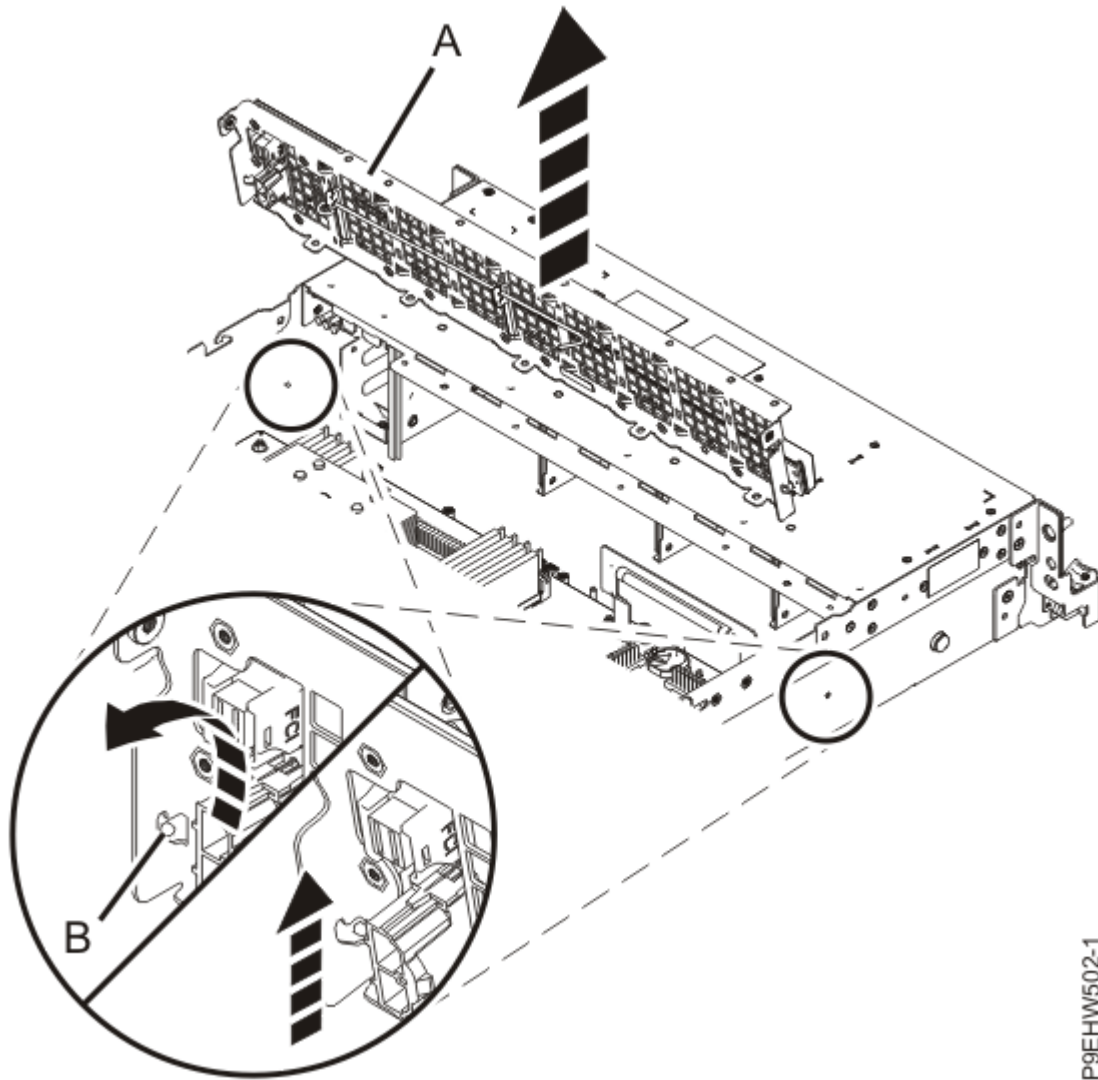
9. Remove five screws **(A)** from the top of the disk drive and fan card.
See [Figure 68 on page 73](#) for the screw locations.



P9EHW500-1

Figure 68. Screw locations for the disk drive and fan card

- a) Remove two screws **(B)** from the bottom of the disk drive and fan card.
 - b) Remove one screw **(C)** 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.



P9EHW502-1

Figure 69. 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-GTW or 8335-GTX system

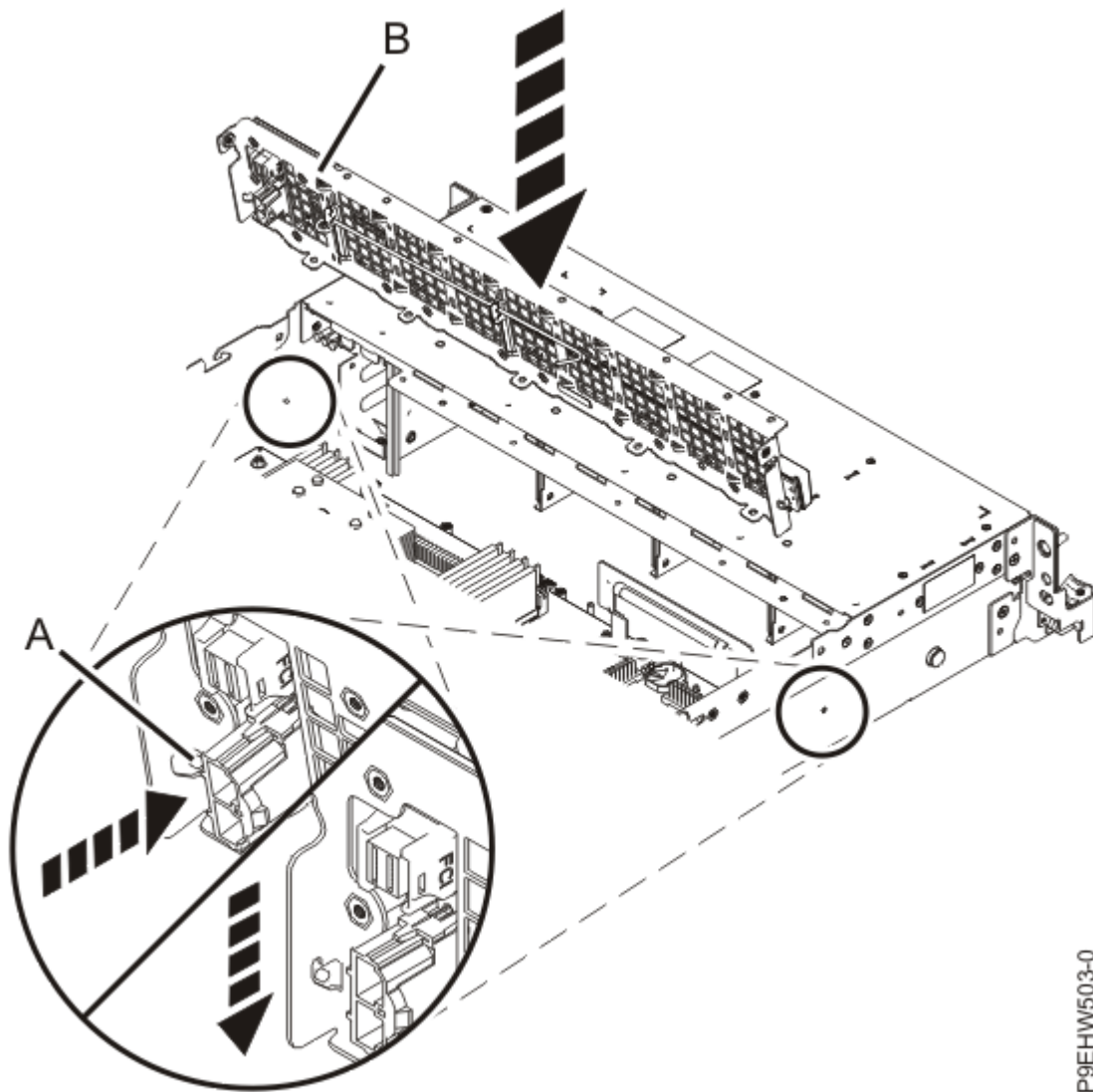
To replace a disk drive and fan card, complete the steps in this procedure.

Procedure

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

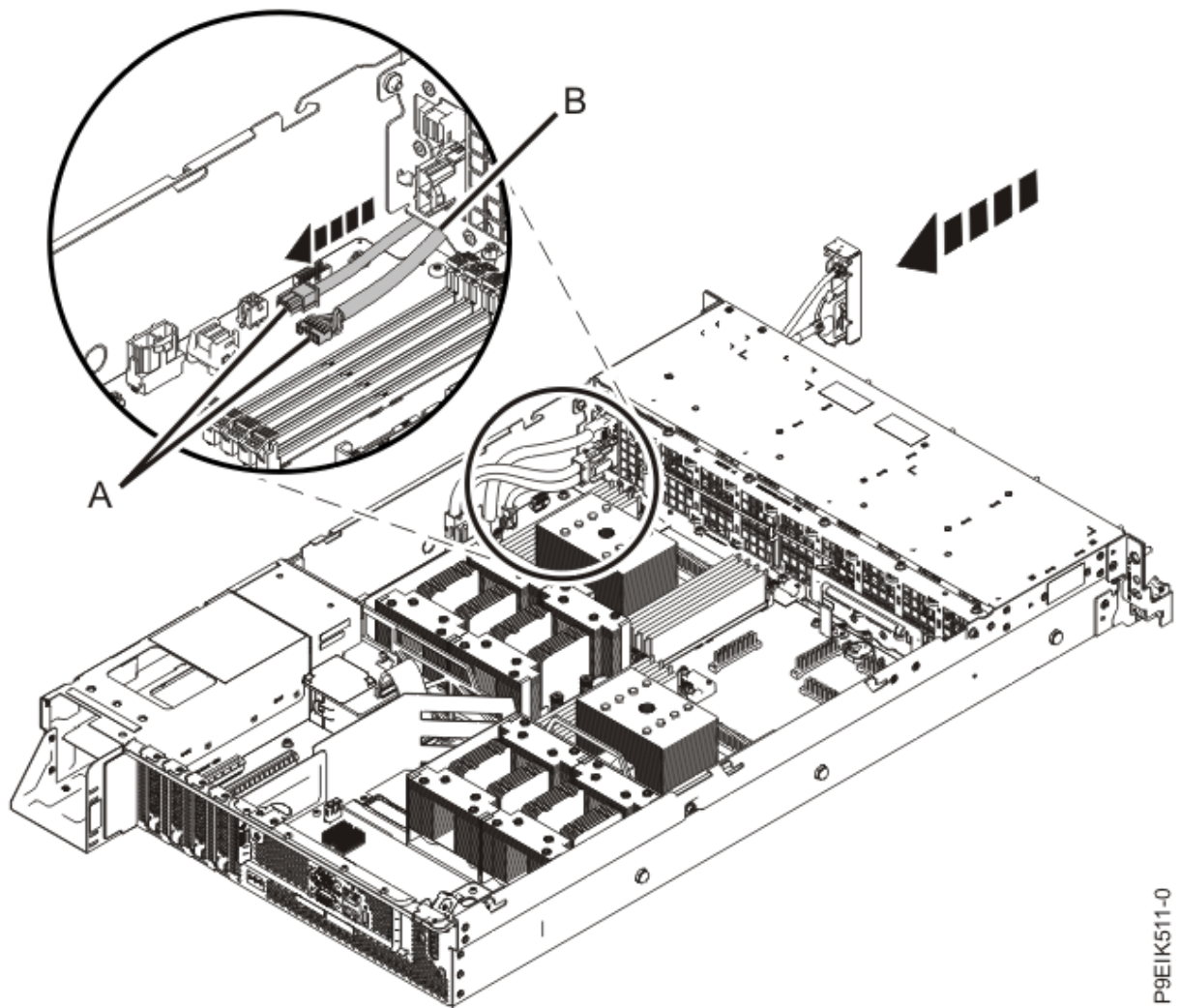
See [Figure 70](#) on page 75.

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 71](#) on page 76.



P9EHW503-0

Figure 70. Inserting the disk drive and fan card



P9EIK511-0

- Figure 71. Routing the cables under the disk drive and fan card*
4. Replace two screws (**B**) for the bottom of the disk drive and fan card.
Figure 72 on page 77 shows the screw locations.

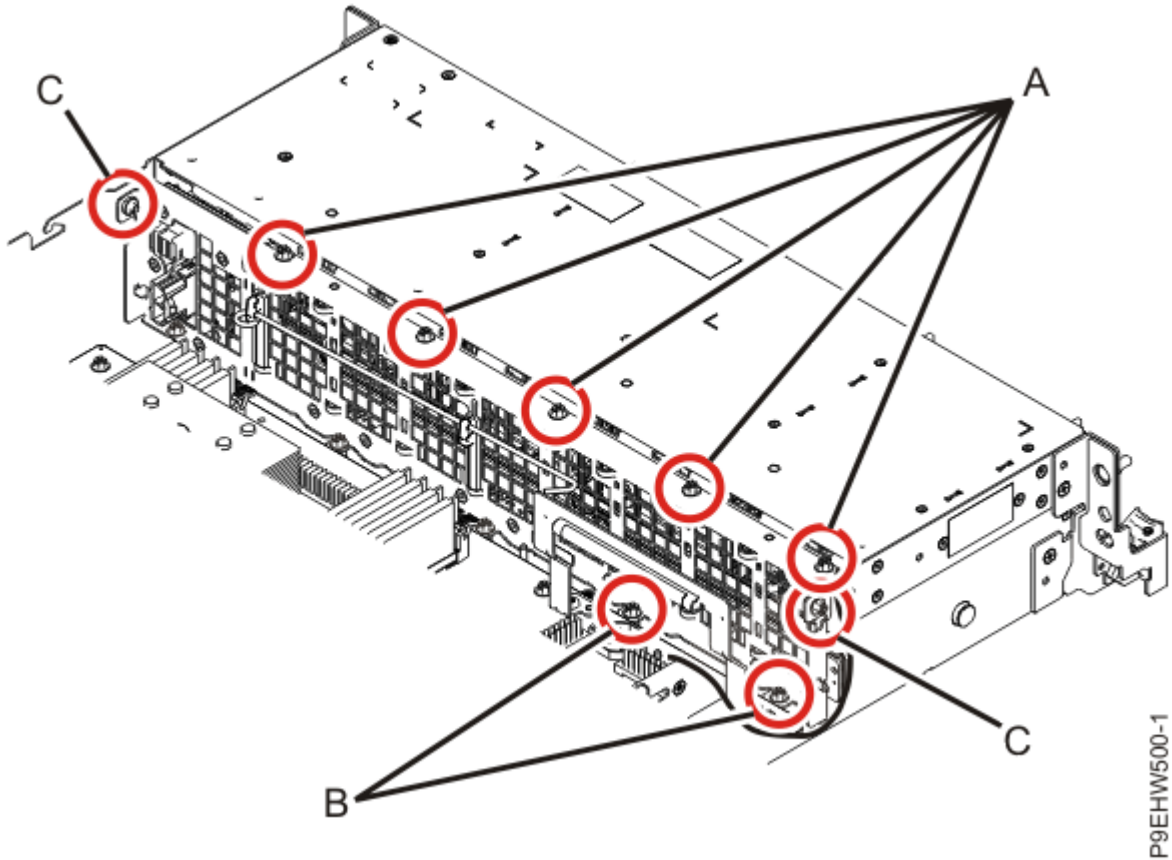


Figure 72. Screw locations for the disk drive and fan card

- a) Replace five screws **(A)** at the top of the disk drive and fan card.
 - b) Replace one screw **(C)** in each side of the disk drive and fan card.
5. Replace the water pipe and holder as shown in Figure 73 on page 78.
Use the alignment pin **(A)** to align the front pipe assembly in the chassis.



Figure 73. Replacing the front pipe and holder

6. For the water pipe at position **(C)**, tighten the screw **(D)** as shown in [Figure 74](#) on page 79.
7. Replace the three screws **(B)** to secure the front water pipe bracket **(A)** as shown in [Figure 74](#) on page 79.

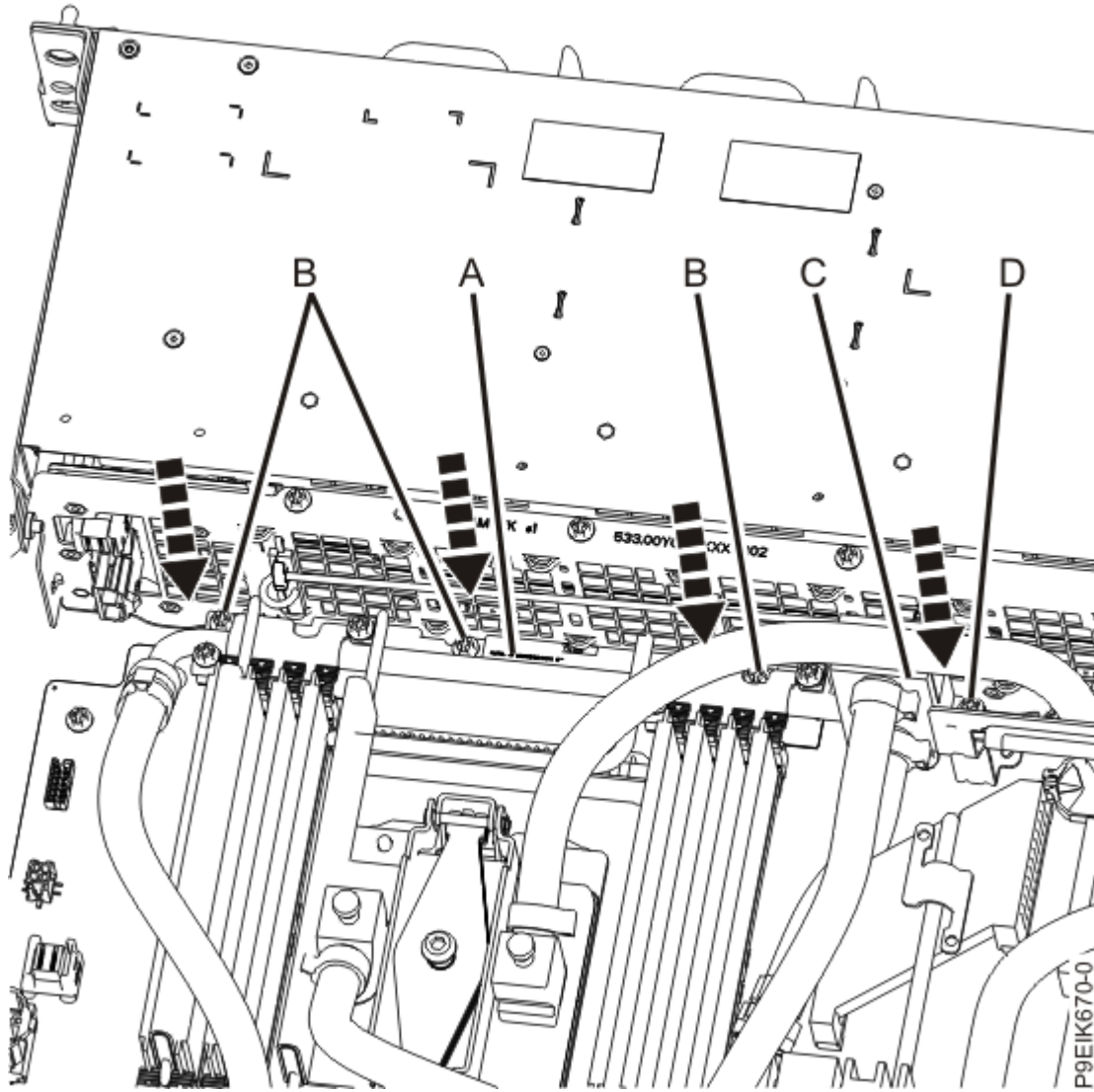
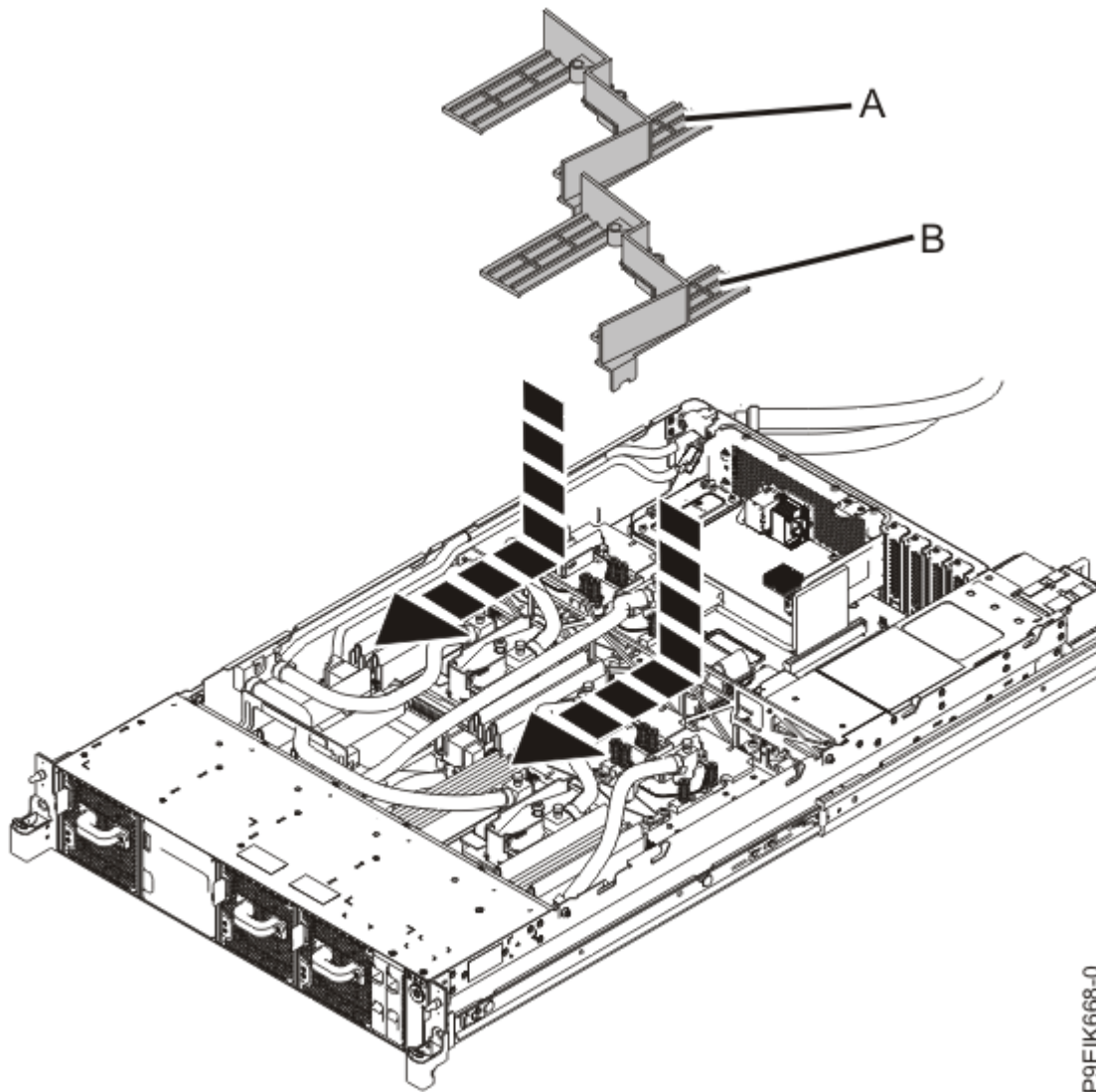


Figure 74. Replacing the front pipe holder

8. Replace the air baffles **(A)** and **(B)** as shown in [Figure 75](#) on page 80.
Carefully move the baffles around the hoses.



P9EIK668-0

Figure 75. Replacing the memory air baffles

9. Replace the fans.

For instructions, see [“Replacing a fan in the 8335-GTW or 8335-GTX system”](#) on page 86.

10. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 83.

11. Using your label, plug the power cable into the disk drive and fan card.

For instructions, see [“Replacing the fan power cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 90.

What to do next

Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

Removing and replacing the disk and fan signal cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX

Learn how to remove and replace a disk and fan signal cable in the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Removing the disk and fan signal cable from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove a disk and fan signal cable, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page [216](#).

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
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 76 on page 82](#).

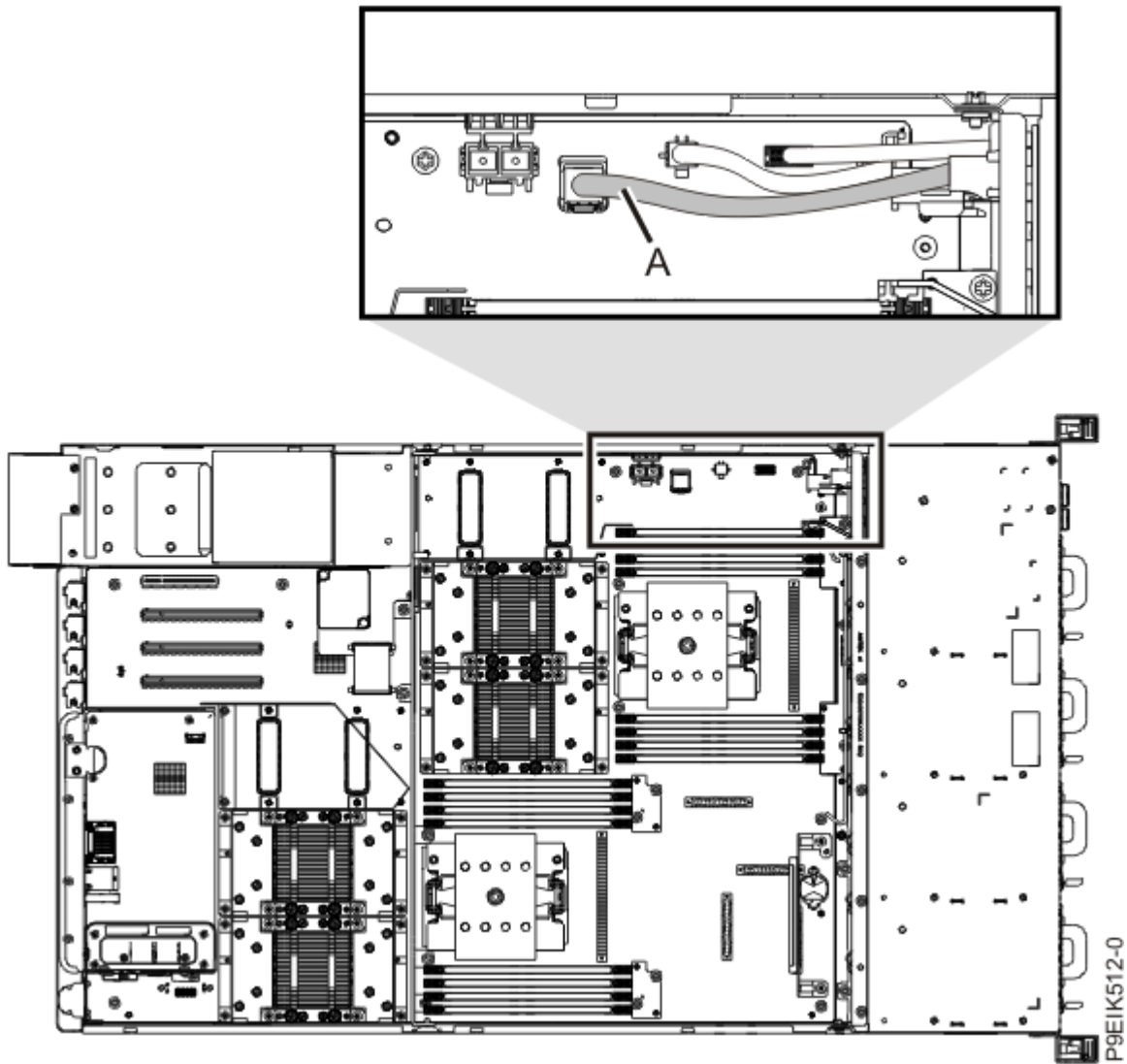


Figure 76. Location of the disk and fan signal cable and connectors

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 77](#) on page [83](#).

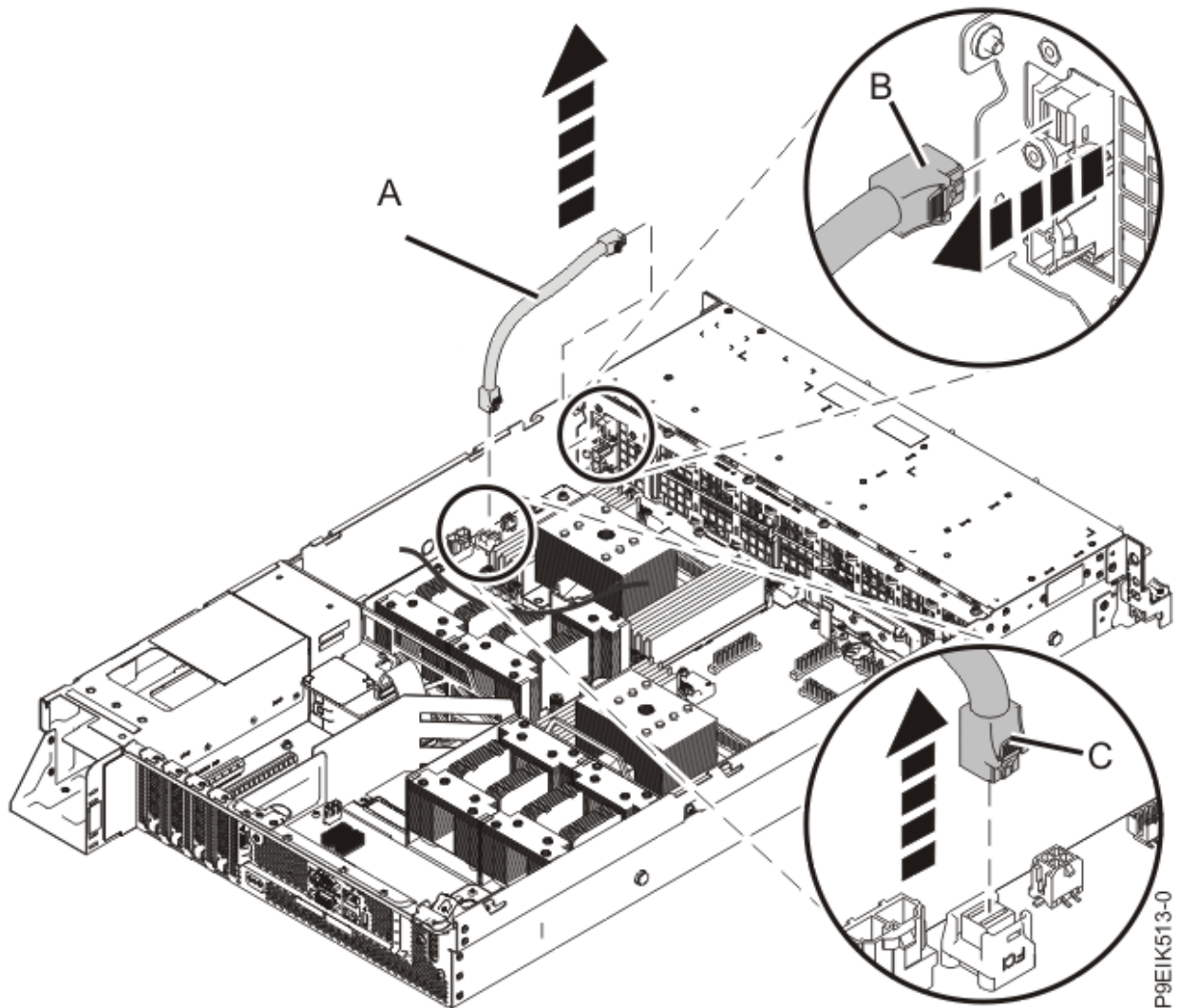


Figure 77. Removing the disk and fan signal cable

5. Place the cable on the table.

Replacing the disk and fan signal cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace a disk and fan signal cable, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so 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 78 on page 84](#).

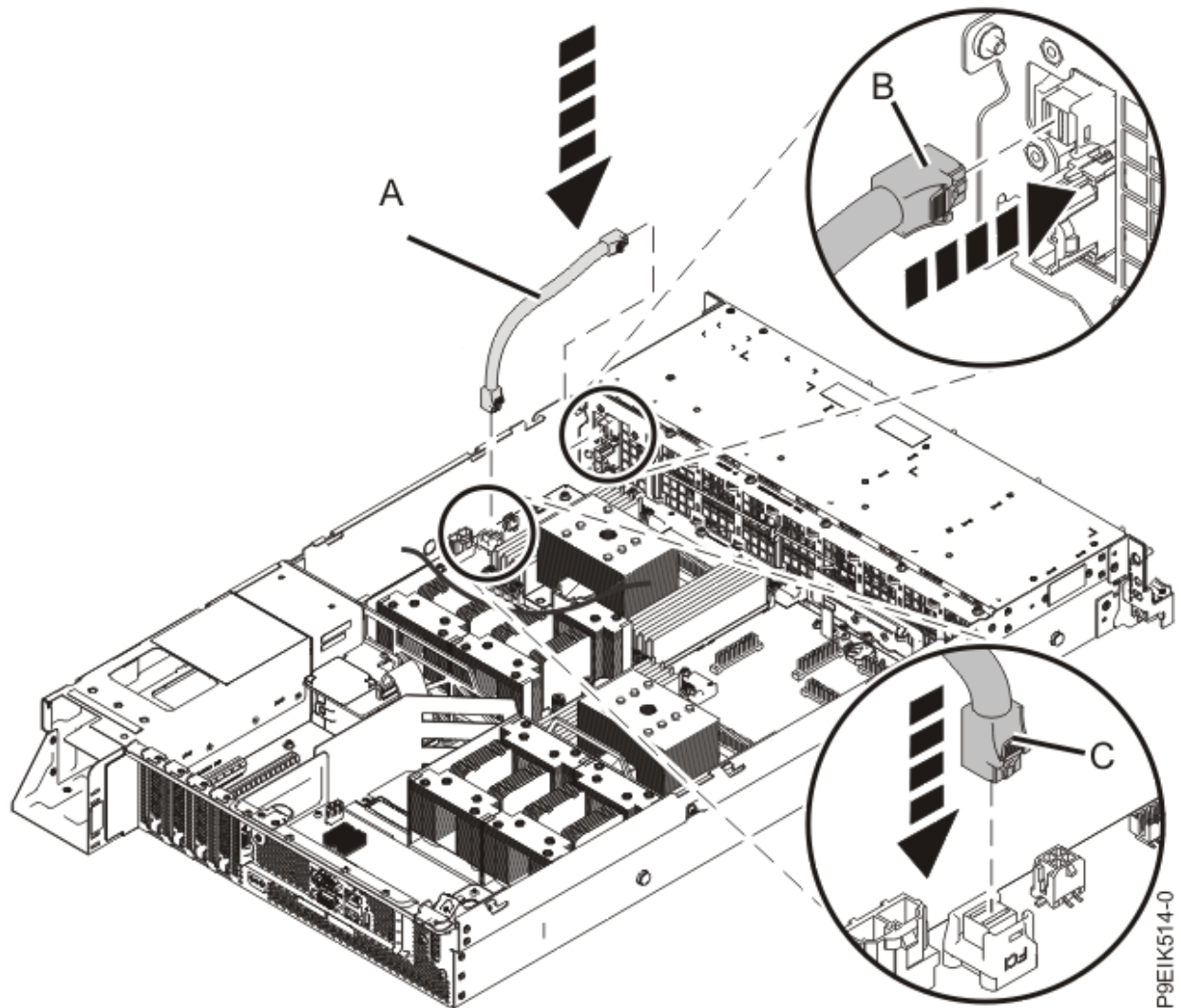


Figure 78. Replacing the disk and fan signal cable

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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Removing and replacing fans in the 8335-GTW or 8335-GTX system

Learn how to remove and replace the fans in the system.

Removing a fan from the 8335-GTW or 8335-GTX system

To remove a fan, complete the steps in this procedure.

About this task



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

Procedure

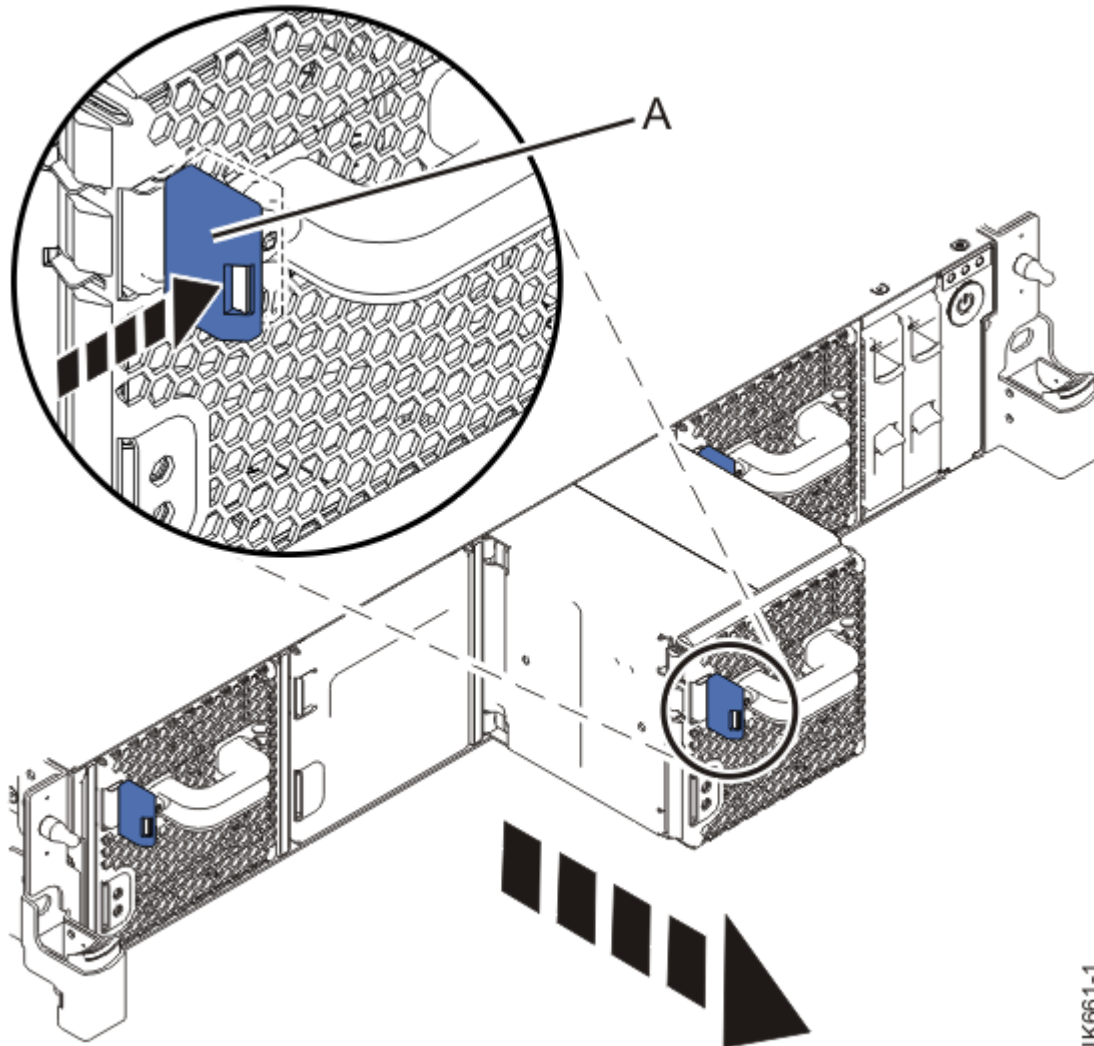
1. Attach the electrostatic discharge (ESD) wrist strap.

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. To unseat the fan from its position in the system, press in the locking-tab **(A)** as shown in [Figure 79](#) on [page 85](#).



P9EIK661-1

Figure 79. Removing a fan from the system



Attention: Water-cooled systems have a fan filler in the second position from the left. The fan filler, if removed, must be replaced in the second position from the left.

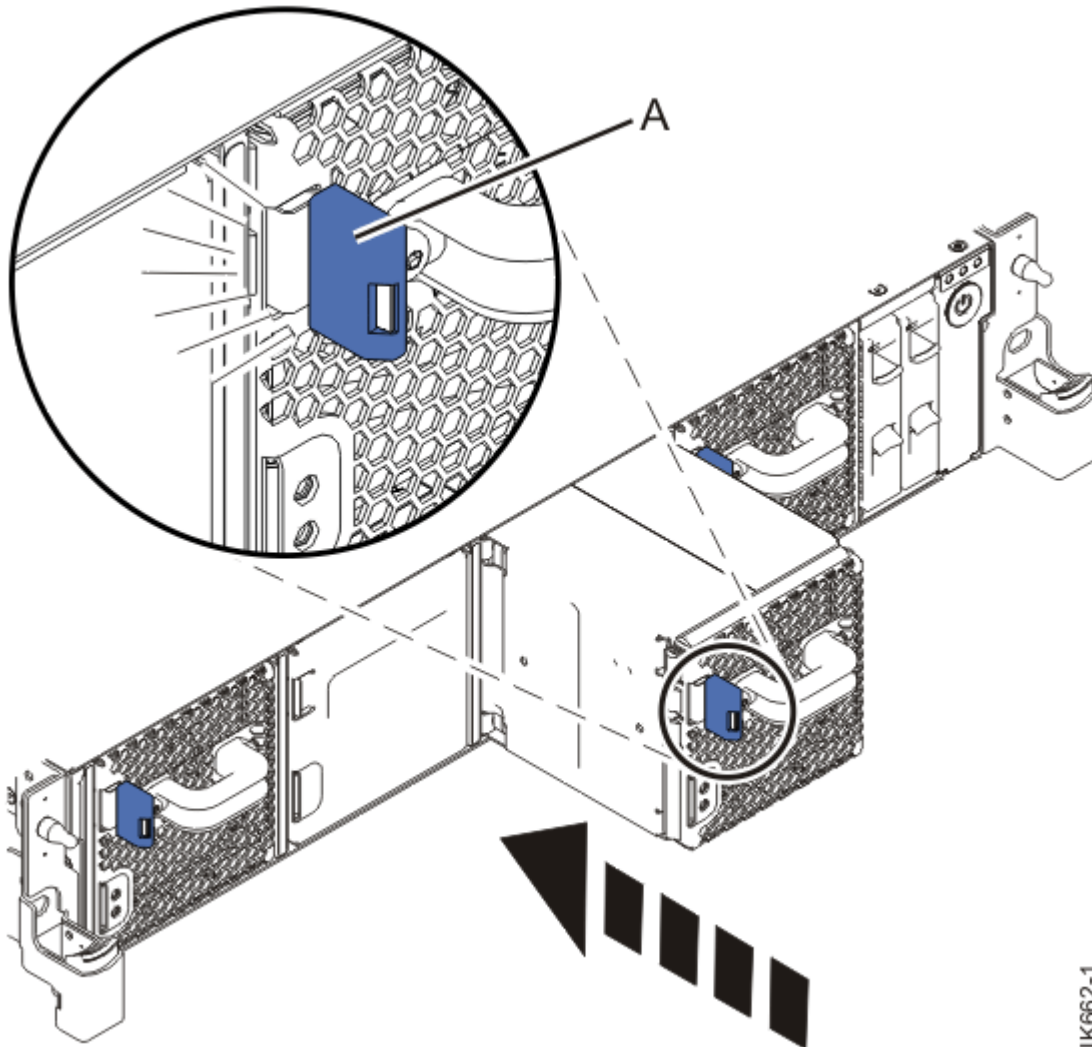
3. While you hold onto the fan handle and use your hand to support the bottom of the fan, pull out the fan from its slot.

Replacing a fan in the 8335-GTW or 8335-GTX system

To replace a fan, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so 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 tab **(A)** locks in place as shown in [Figure 80](#) on page 86.



P9EIK662-1

Figure 80. Replacing a fan in the system



Attention: Water-cooled systems have a fan filler in the second position from the left. The fan filler, if removed, must be replaced in the second position from the left.

Removing and replacing the fan power cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn how to remove and replace the fan power cable in the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Removing the fan power cable from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove a fan power cable, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Locate where the fan power cable is connected to the system backplane. See **(A)** in [Figure 81 on page 88.](#)

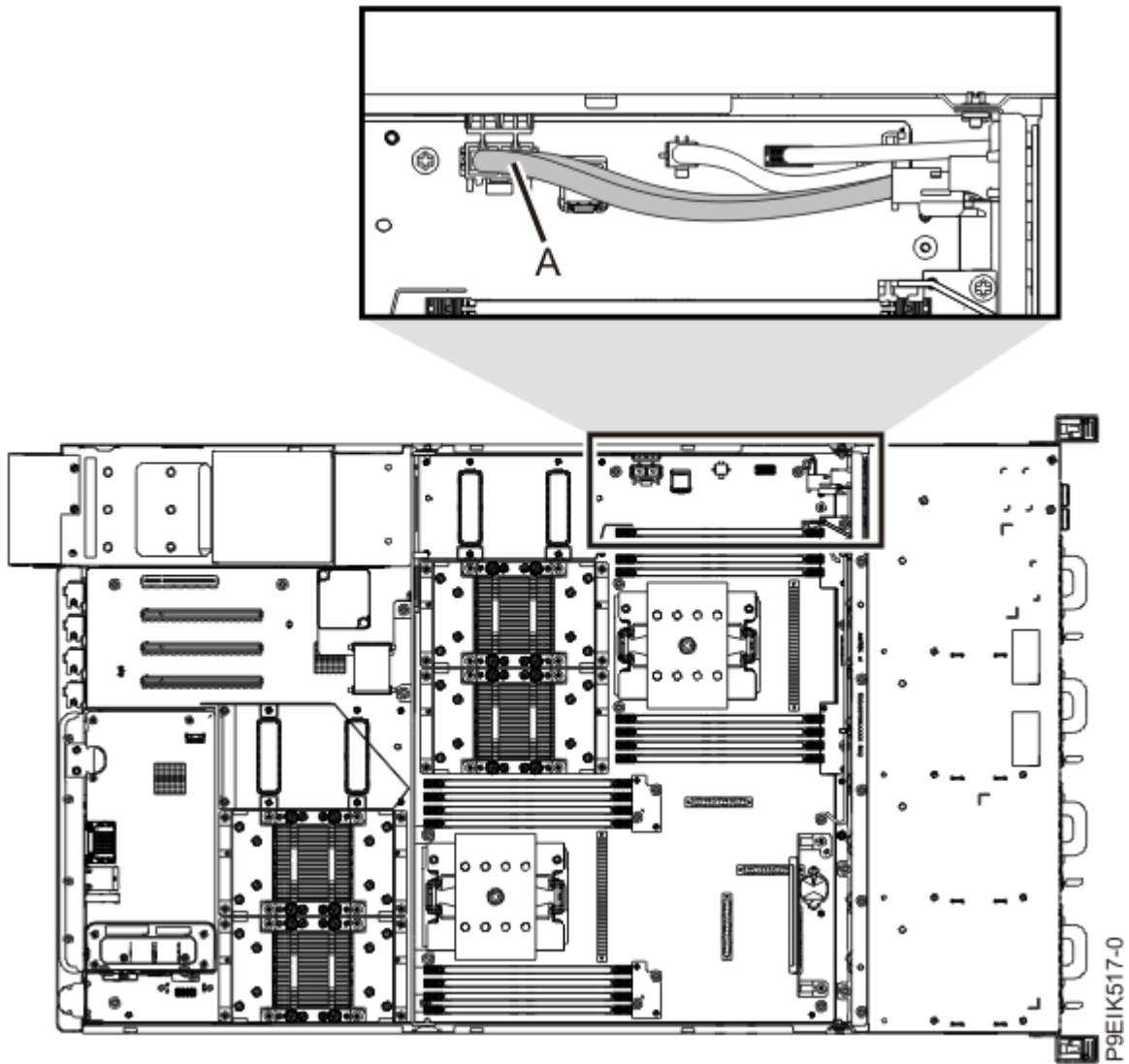
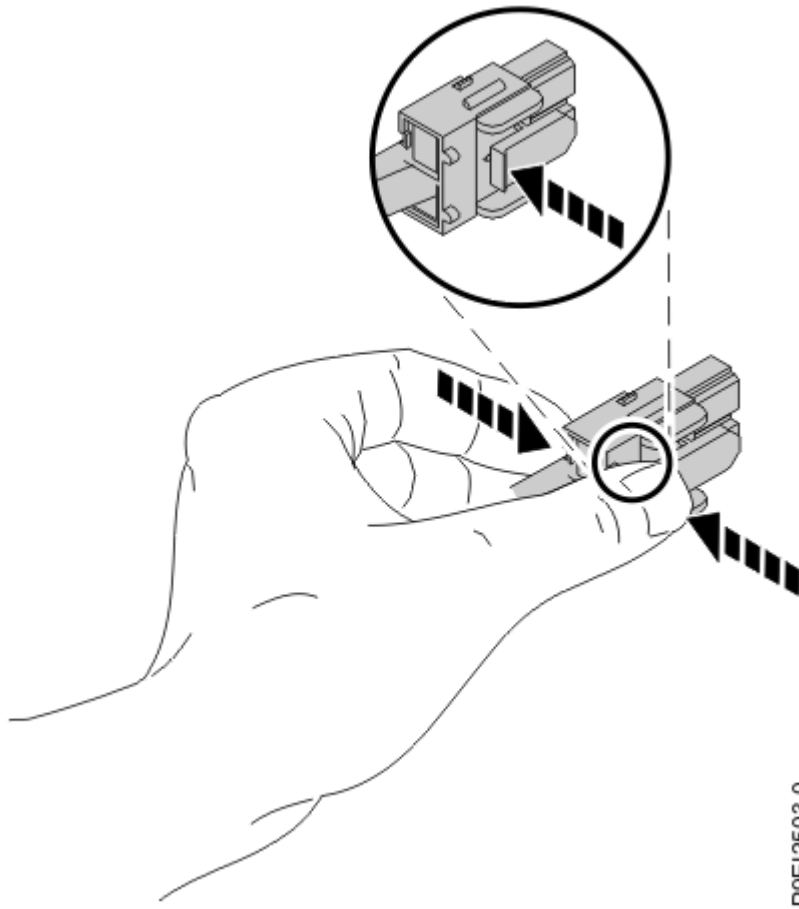


Figure 81. Location of the fan power cable and connectors

3. Grasp the connector end of the fan power cable that is connected to the power riser. See **(A)** in [Figure 82](#) on page 90.
4. While you press the latch release lever with your thumb, disconnect the cable from the connector.



P9EI2503-0

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

5. Disconnect the fan power cable connector end from the disk drive and fan card.
6. Lift the fan power cable to remove it from the system. Be careful to ensure that the ends of the cable do not catch on any components as you remove it.

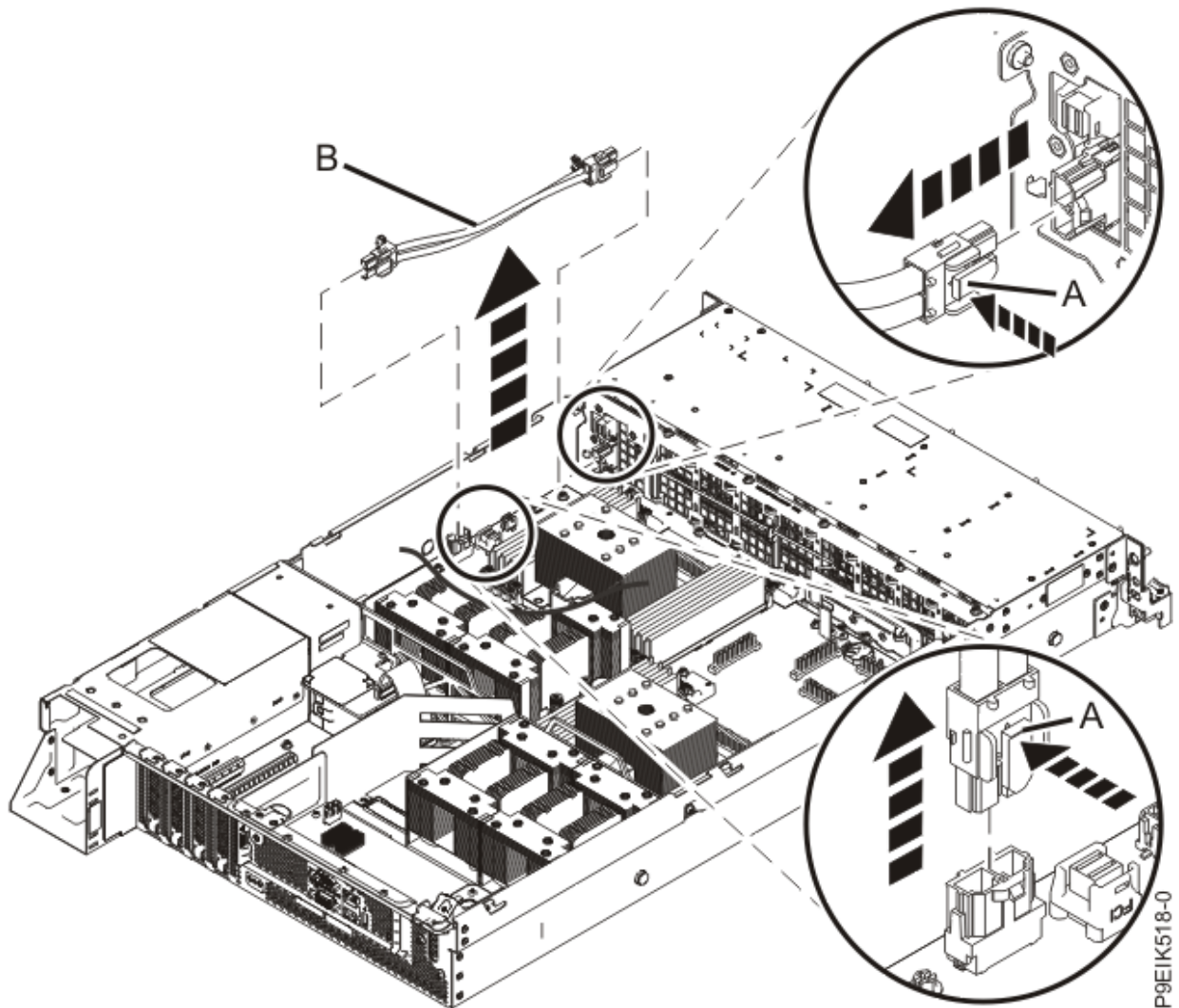


Figure 82. Removing the fan power cable from the system

Replacing the fan power cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace a fan power cable, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Route the fan power cable (**A**) connector end through the opening and connect it to the power riser as shown in [Figure 83](#) on page 91.
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 83](#) on page 91.

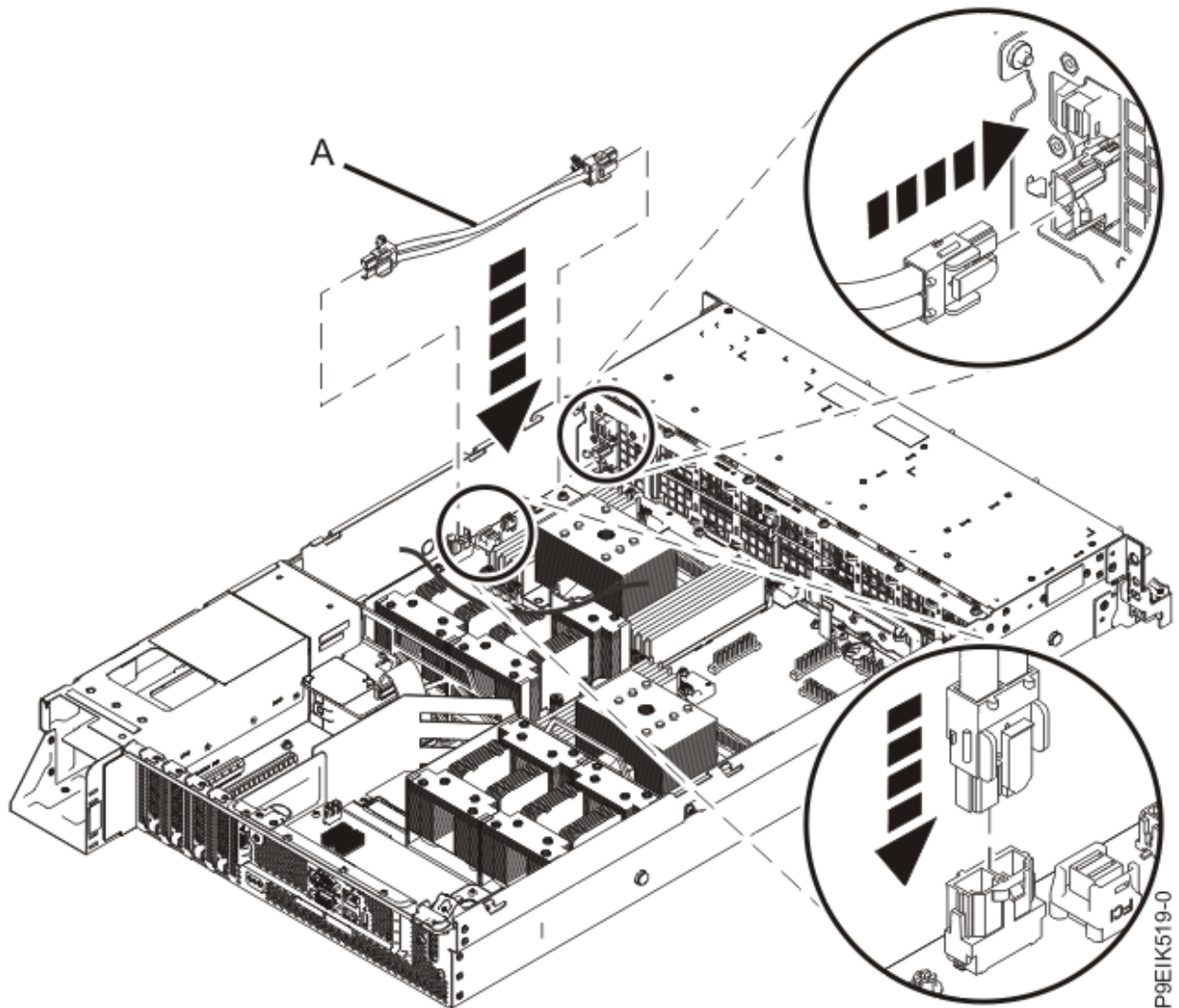


Figure 83. Installing the fan power cable

What to do next

Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

Removing and replacing a graphics processing unit in the 8335-GTW or 8335-GTX system

Learn how to remove and replace a graphics processing unit (GPU) in the system.

Removing the graphics processing unit from a water-cooled 8335-GTW or 8335-GTX system

To remove a graphics processing unit from a water-cooled 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts”](#) on page 216.

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.

As part of the GPU replacement, the cold plate is removed. Each GPU must have thermal interface material (TIM) between the GPU and the cold plate. When a GPU is replaced, each of the TIMs that share the coldplate must also be replaced. Ensure that you have spare GPU TIMs available before proceeding.

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. If you are removing multiple GPUs, label the GPUs, noting their positions and orientations.
The system has 2 or 3 GPUs under a cold plate, depending on the system's configuration.
 3. Remove the air baffle next to the GPU you are replacing.
 4. Remove the cold plate for the GPU you are replacing.
 - a) Loosen the cold plate retainer screw from each of the 2 or 3 GPUs and swing each retainer open as shown in [Figure 84](#) on [page 93](#).



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

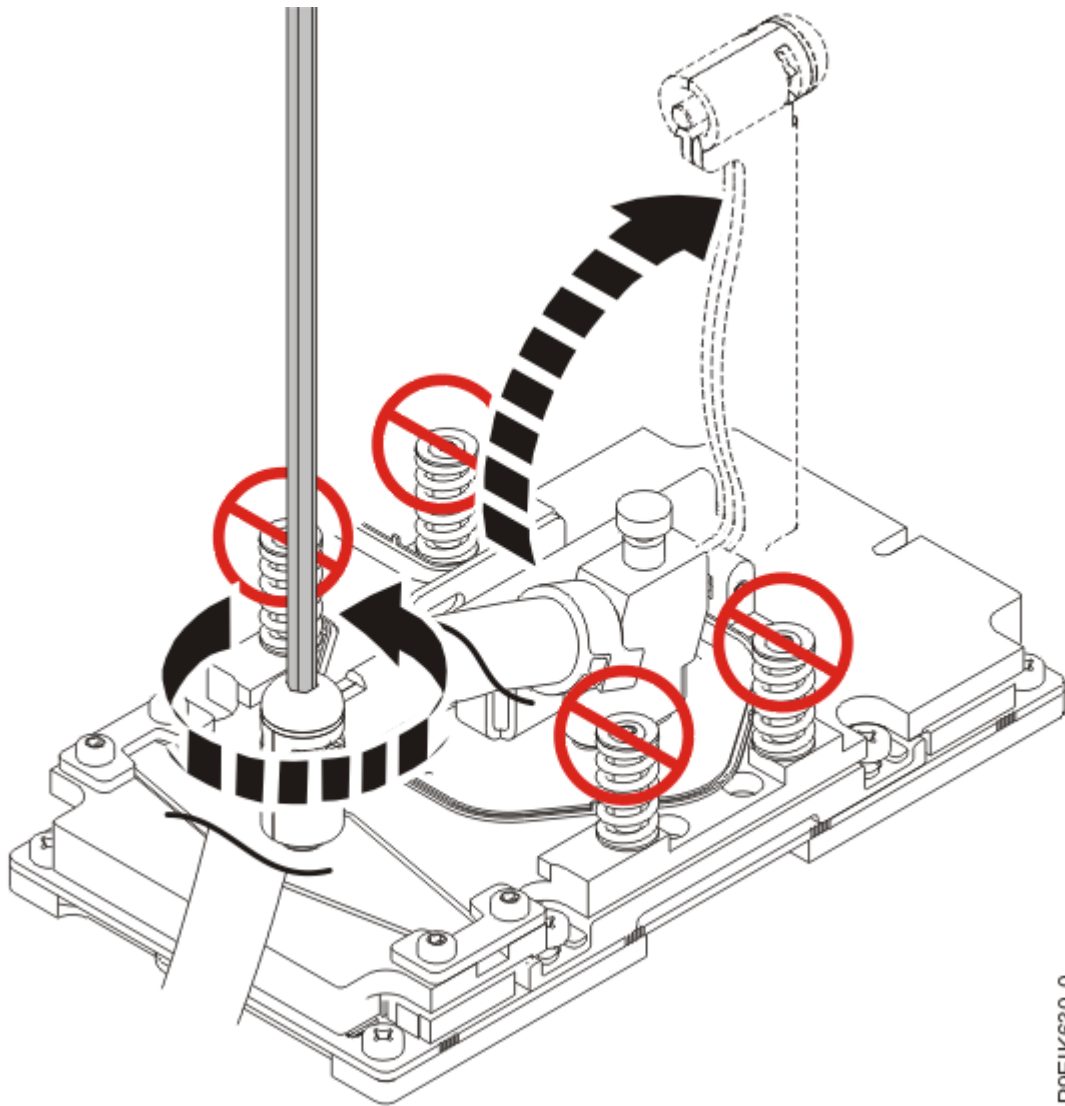


Figure 84. Open the cold plate retainer

- b) Lift the cold plate **(A)** off the GPUs that you are removing and attach the cold plate to the service hook **(B)** as shown in [Figure 85](#) on page 94.

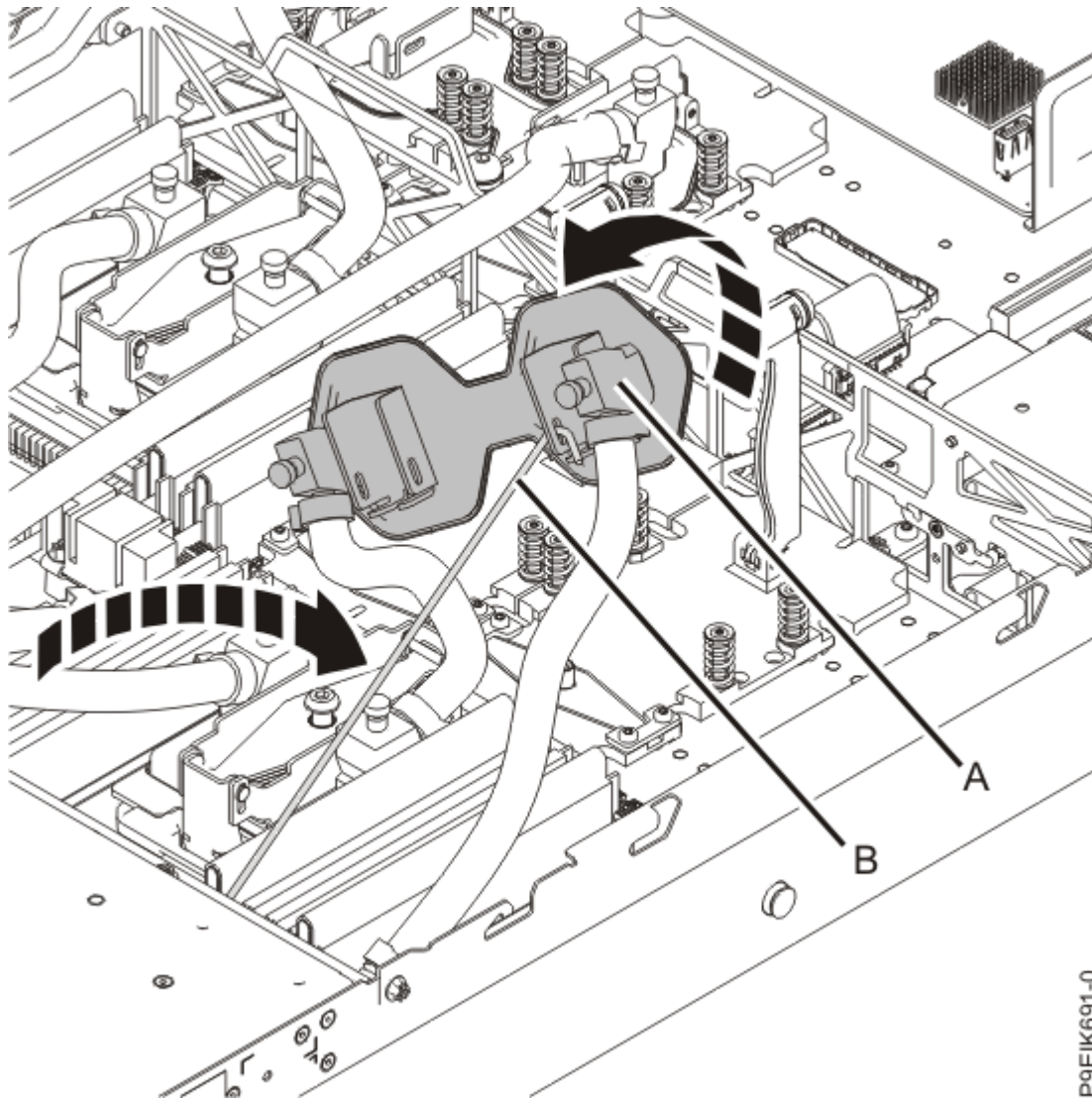
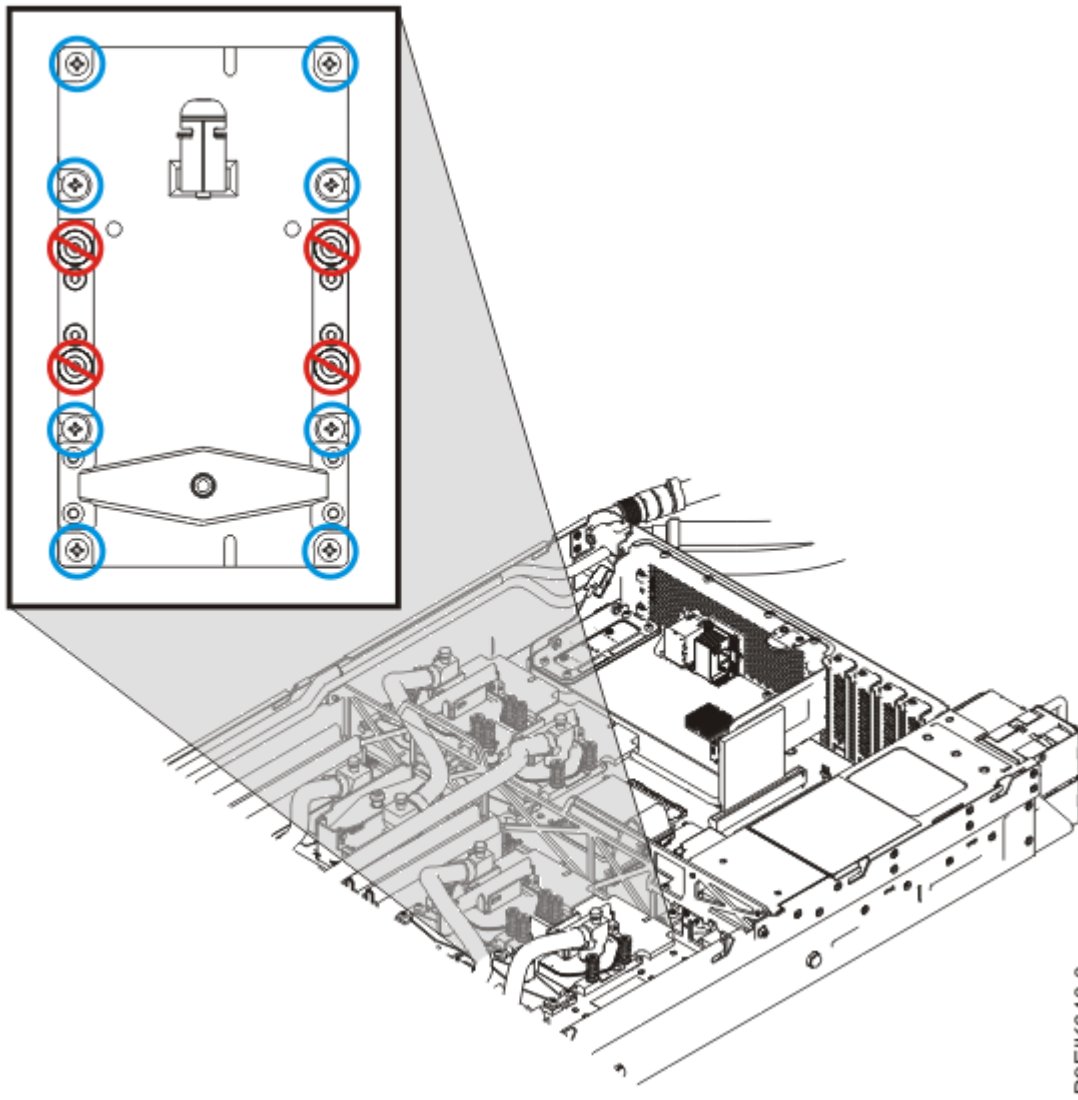


Figure 85. Remove the cold plate; attach to clip

5. For the GPU you are removing, remove the eight screws shown in [Figure 86](#) on page 95.



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



P9EIK640-0

Figure 86. Remove eight GPU screws per GPU; do not loosen the four spring-loaded screws

6. 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 87](#) on page 96.

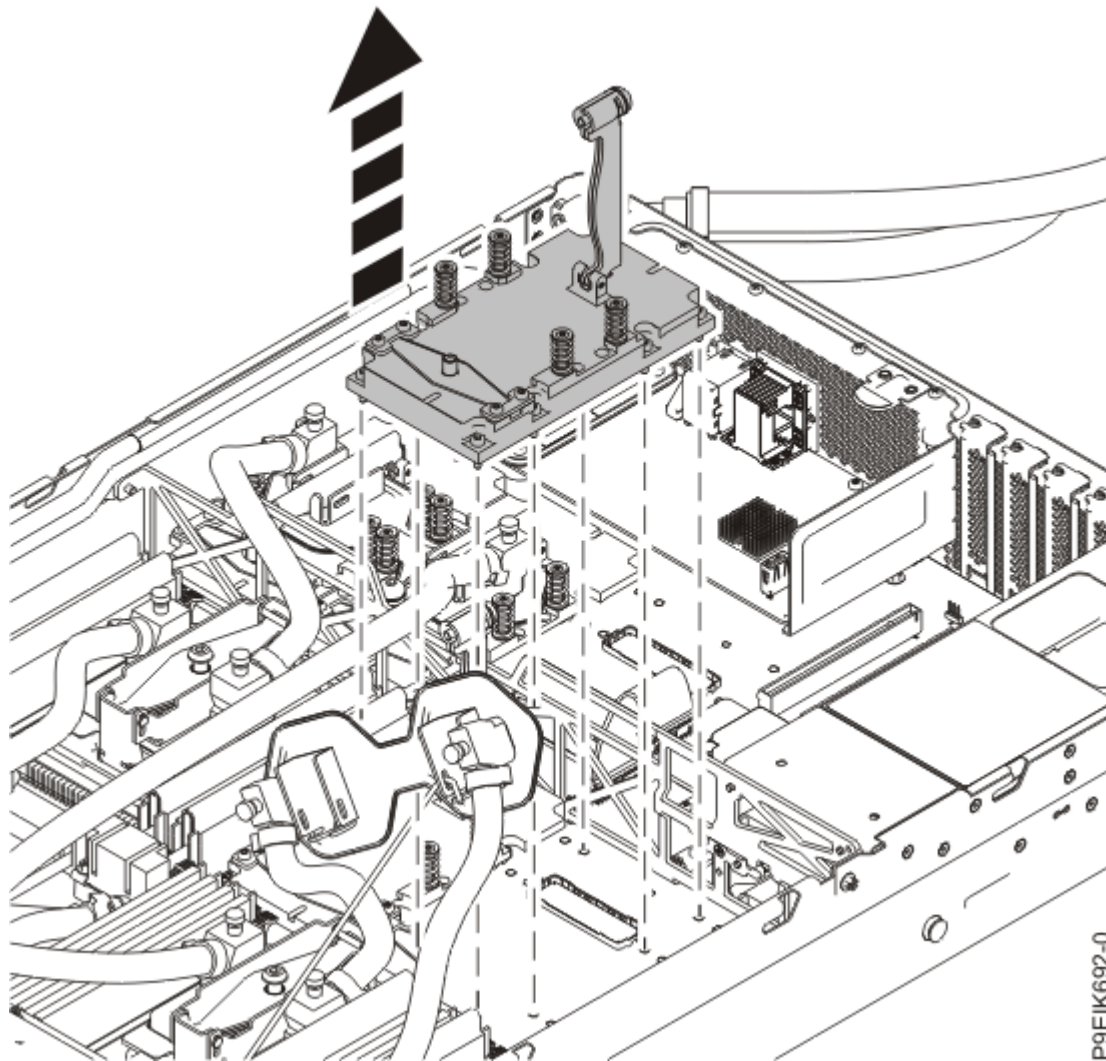


Figure 87. Remove GPU

Replacing the graphics processing unit in a water-cooled 8335-GTW or 8335-GTX system

To replace a graphics processing unit in a water-cooled system, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Remove the GPU from the protective packaging. Remove the protective covers from the bottom of the GPU.
Remove the protective cover starting with its corner.
3. 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.

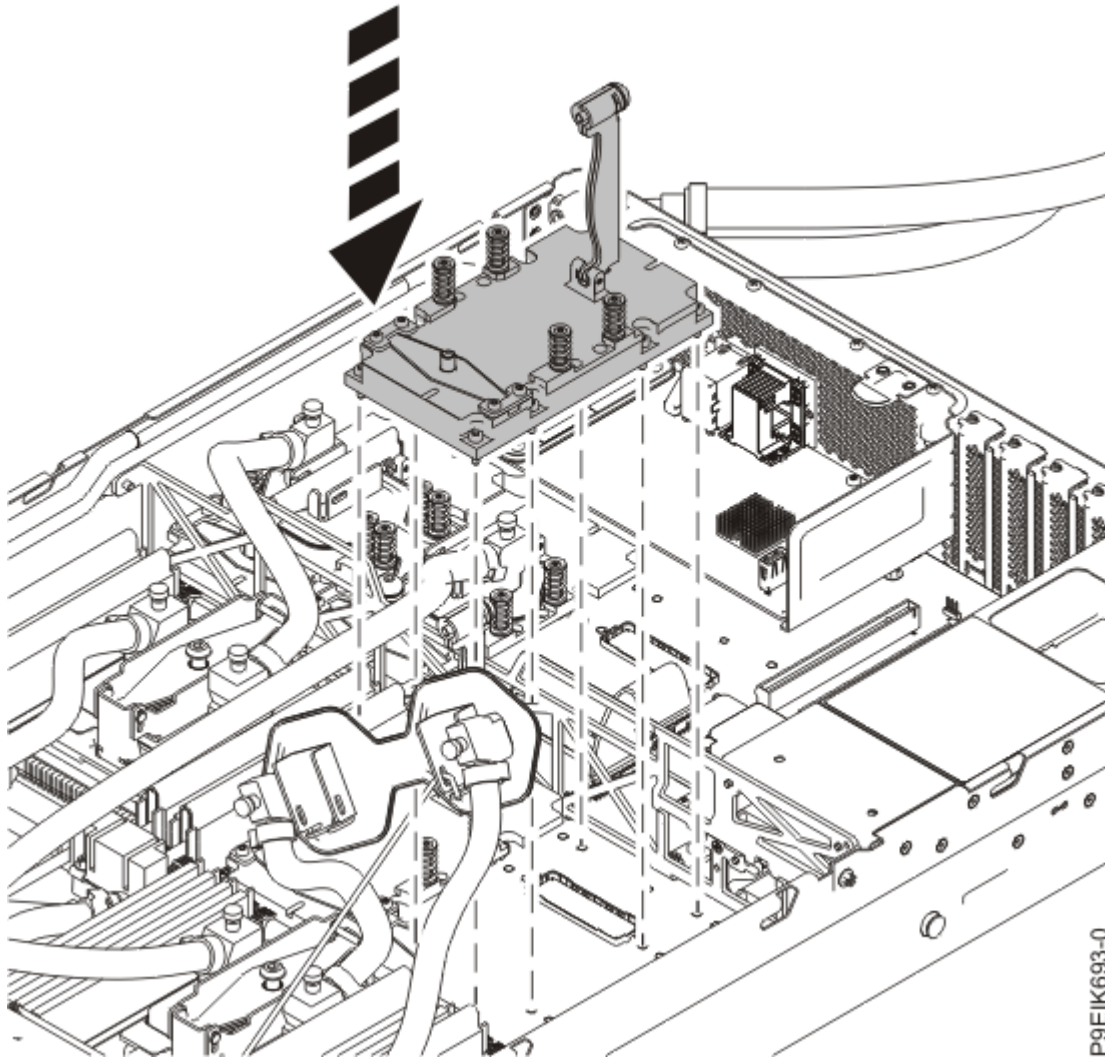
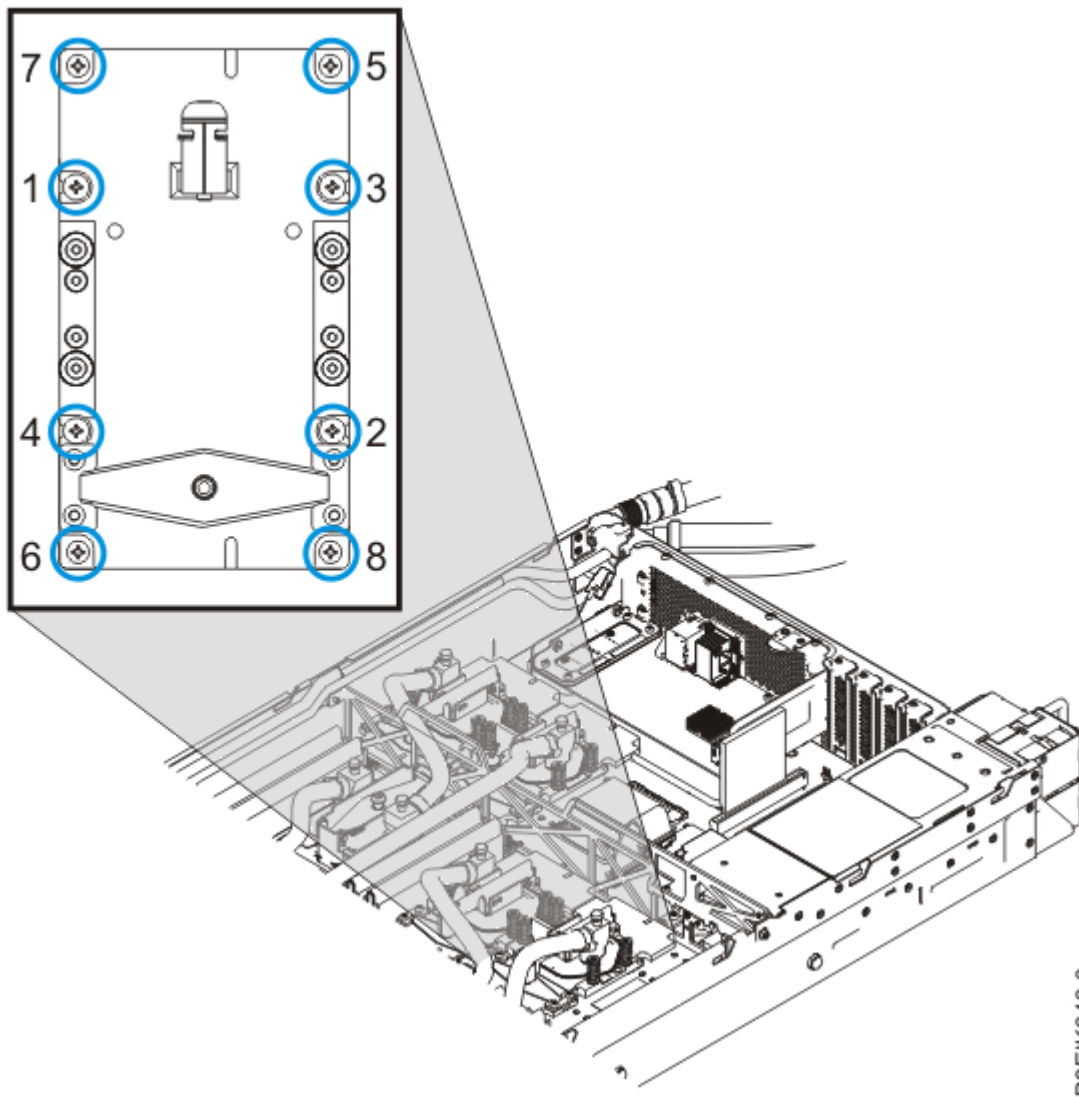


Figure 88. Replace GPU

4. Secure the GPU to the system backplane. Use a #2 Phillips head screw driver. Tighten the screws in the sequence that is shown in [Figure 89](#) on page 98.

Start with the inner four screws. Thread the inner four screws half-way using the sequence that is shown. Once all four screws are threaded, then fully tighten them. Next, tighten the outer four screws by using the sequence that is shown. Take care to not damage the system backplane with the screw driver tip.



P8EIK643-0

Figure 89. Replacing the GPU assembly into GPU socket

5. Place a new TIM on each of the aluminum heat covers of each GPU, for the cold plate that you are replacing. See [Figure 90](#) on page 99 for the orientation.

The part number is 00E5133.

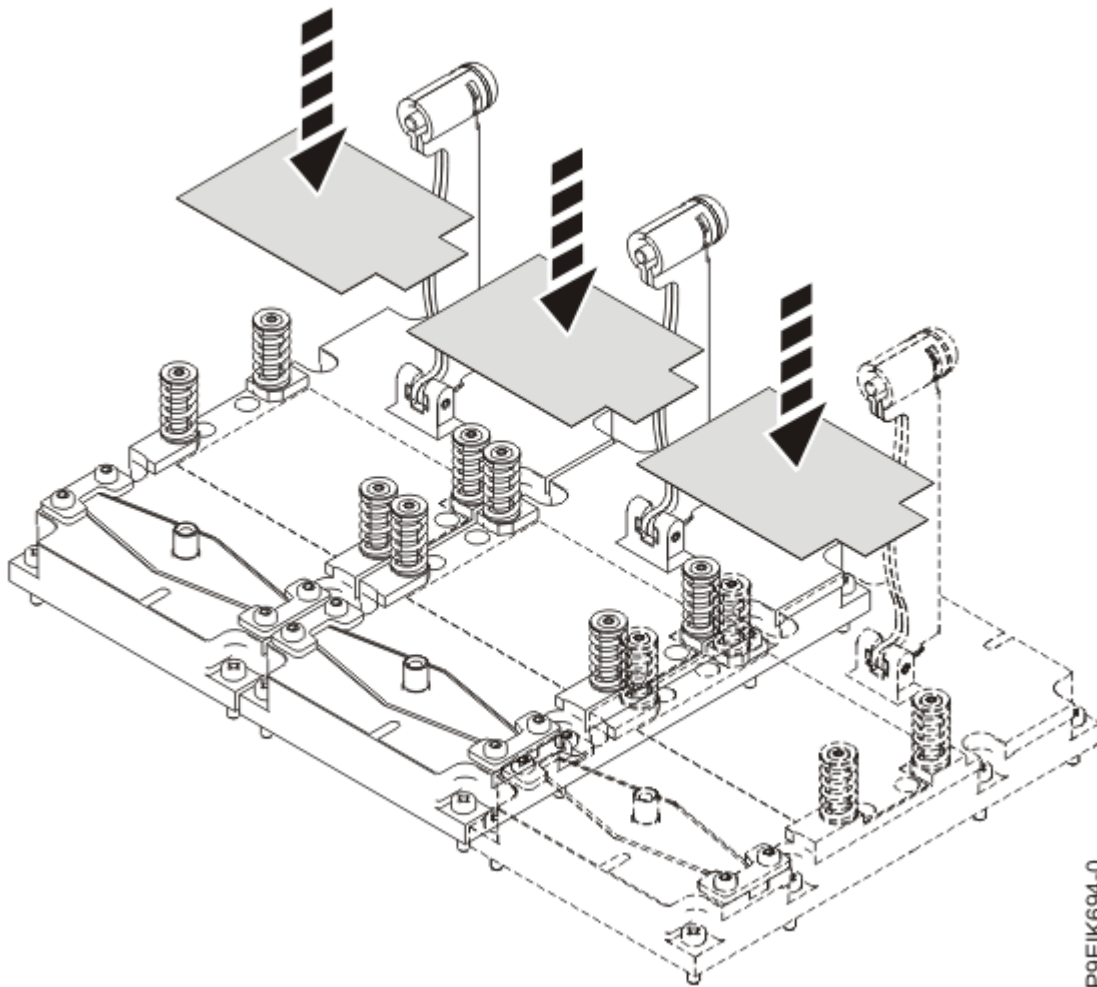
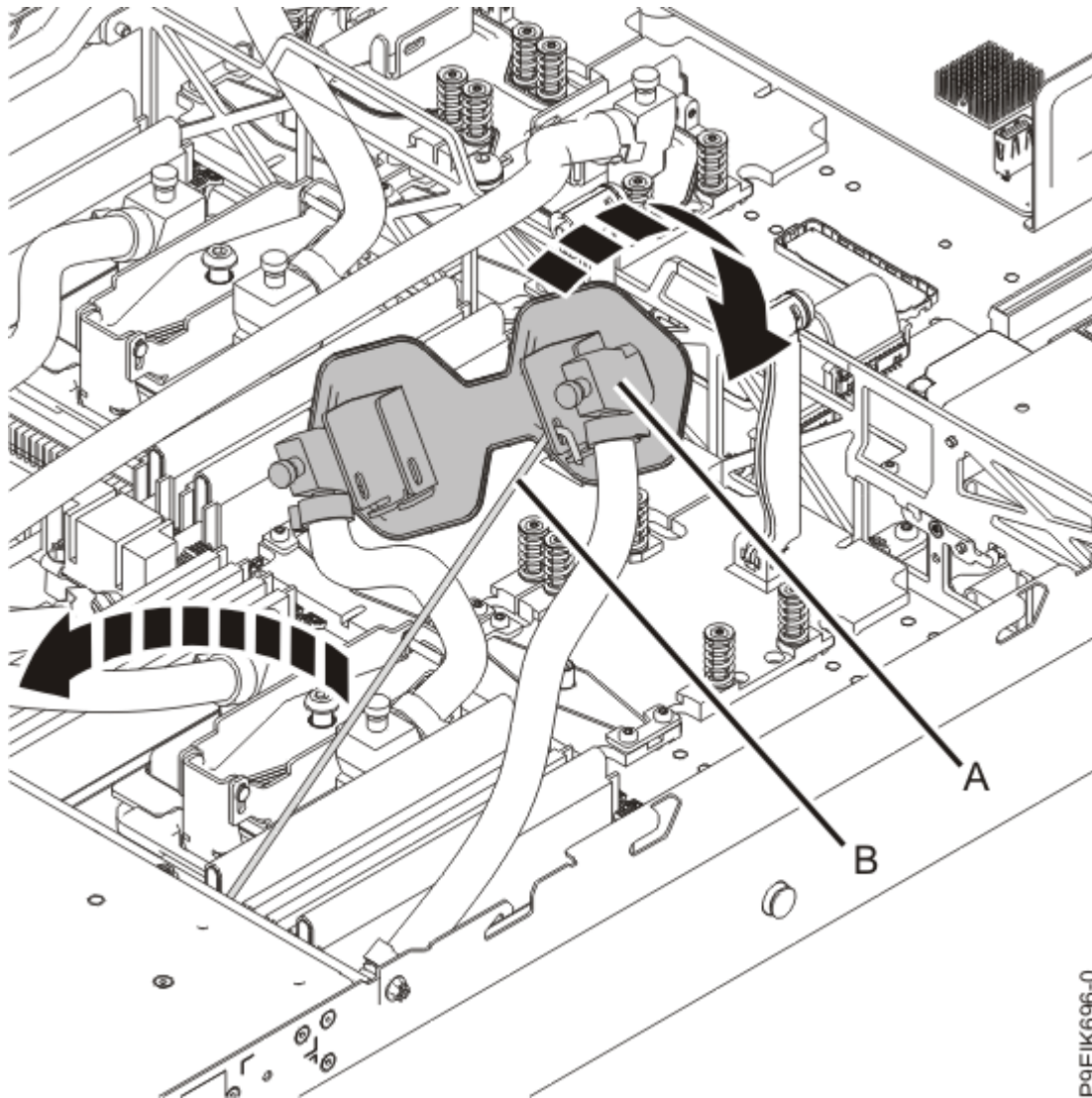


Figure 90. TIM orientation

6. Replace the GPU cold plate.

- a) Unhook the cold plate **(A)** from the service hook **(B)** and carefully align the cold plate on 2 or 3 GPUs.

See [Figure 91 on page 100](#).



P9EIK696-0

Figure 91. Aligning the cold plate on the GPUs

- b) Beginning with the middle GPU, swing the retainer over the GPU and code plate, then tighten the cold plate retainer screw as shown in [Figure 92 on page 101](#). Repeat this step for each of the remaining GPUs.

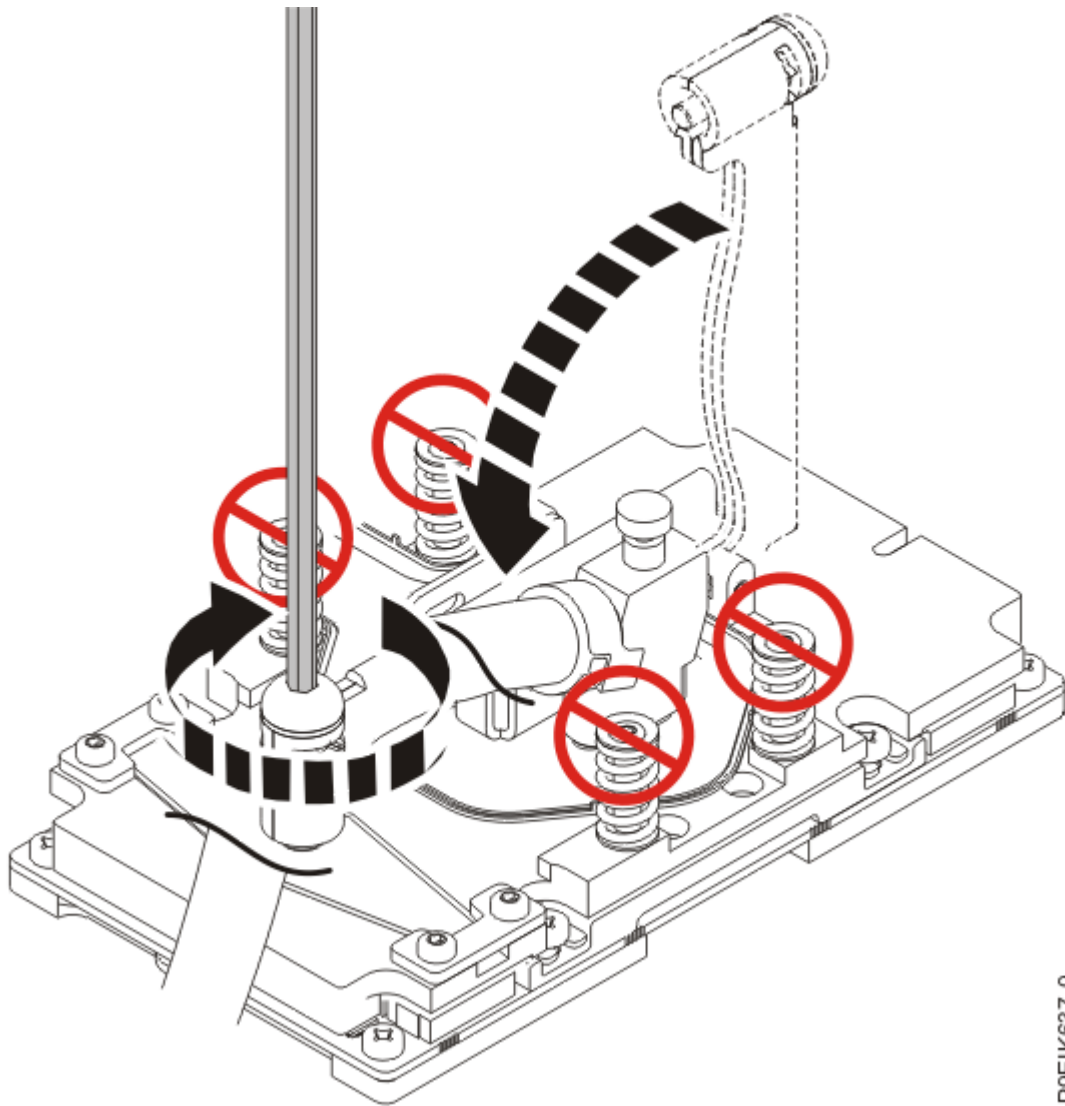


Figure 92. Secure the cold plate retainer screw

- c) Return the service hook to its latched position on the bracket.
- 7. Replace the air baffles you removed.
- 8. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

Removing and replacing memory modules in the 8335-GTW or 8335-GTX system

Learn how to remove and replace memory modules in the system.

Removing and replacing memory modules in the 8335-GTW or 8335-GTX system

To remove and replace memory modules, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



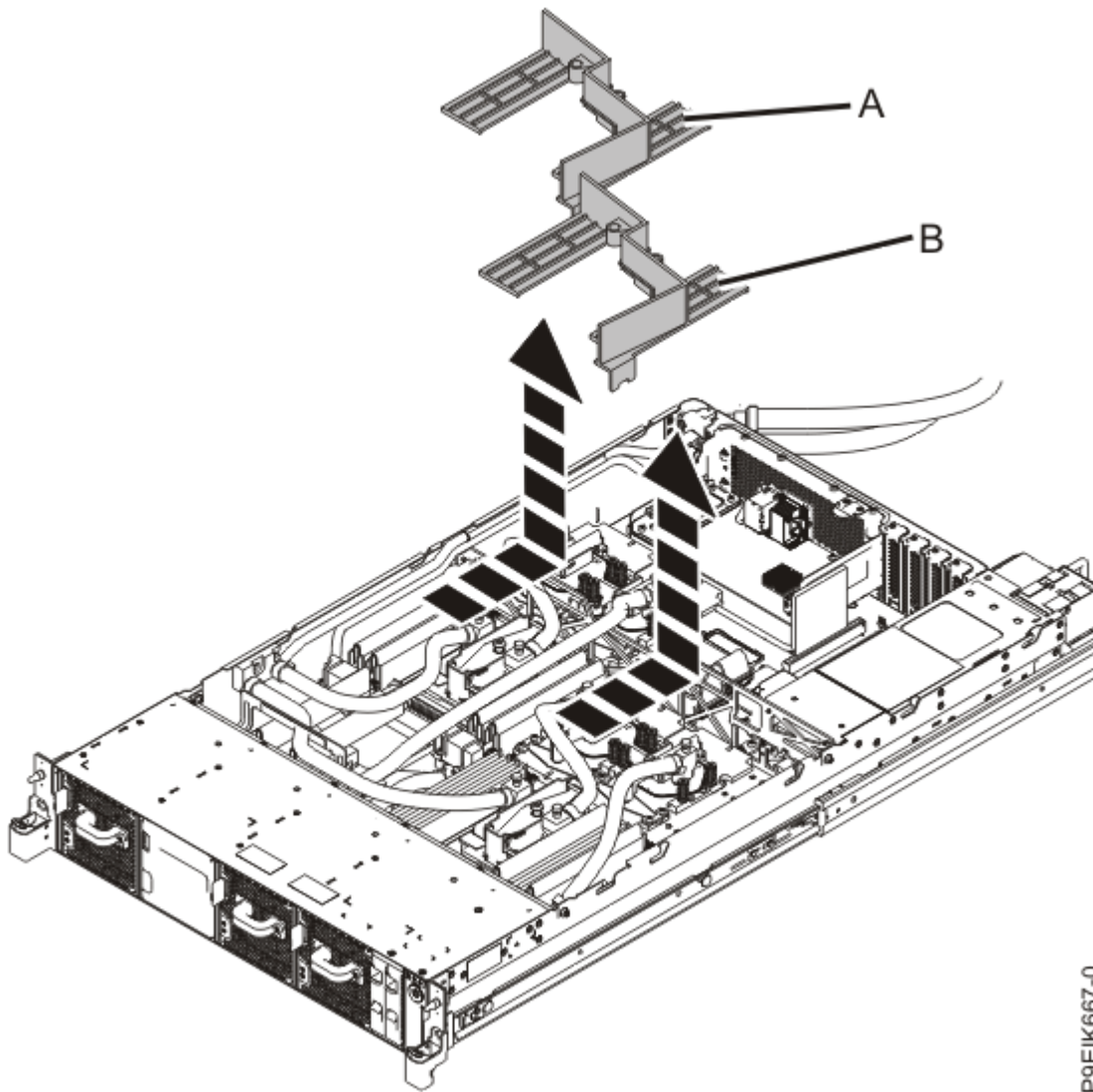
Attention:

- 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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

Remove:

2. Remove the air baffles **(A)** and **(B)** as shown in [Figure 93 on page 103.](#)

Carefully move the baffles around the hoses.



P9EIK667-0

Figure 93. Removing the memory air baffles

3. Locate the memory module to remove. [Figure 94 on page 104](#) shows the location of the memory modules.

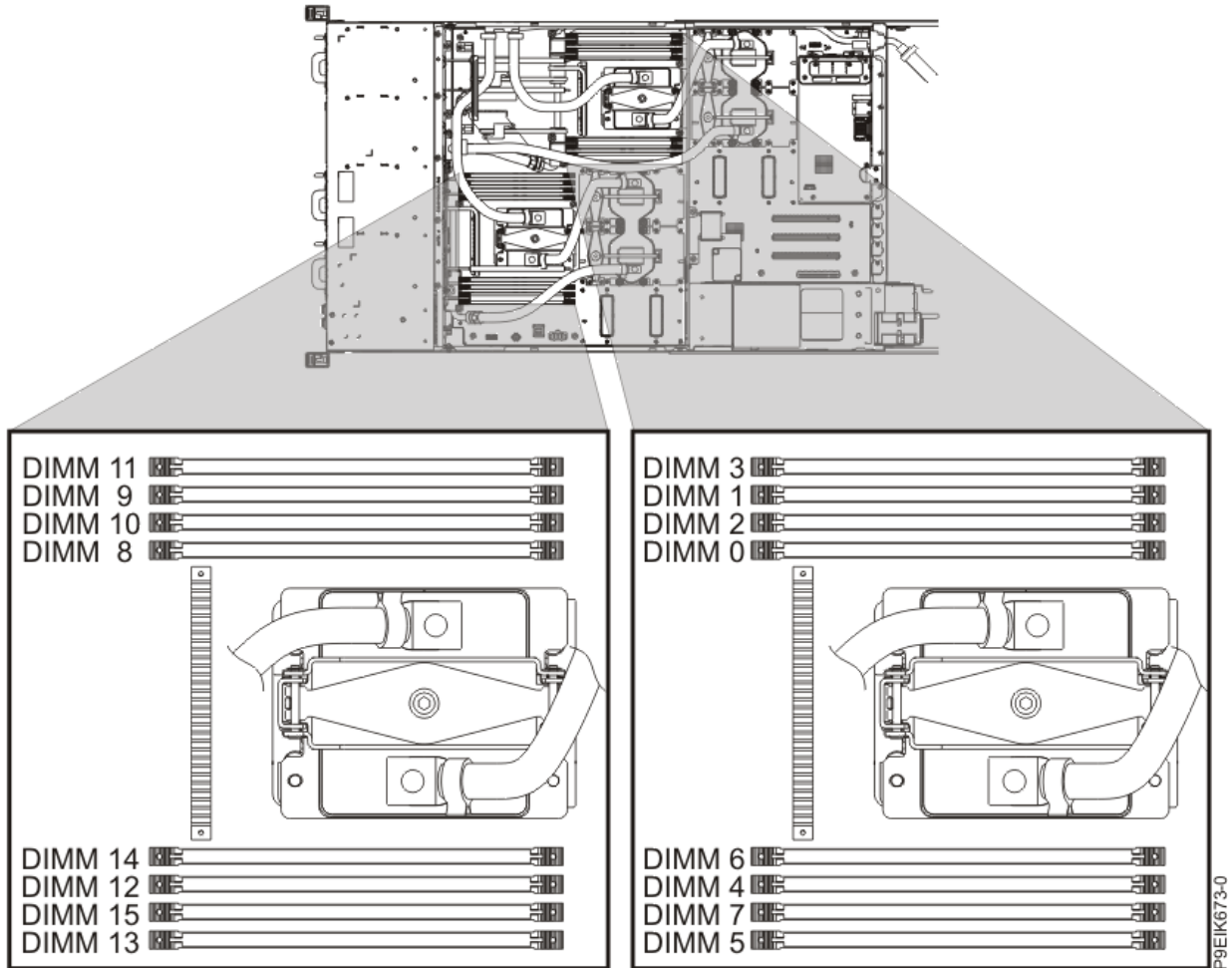
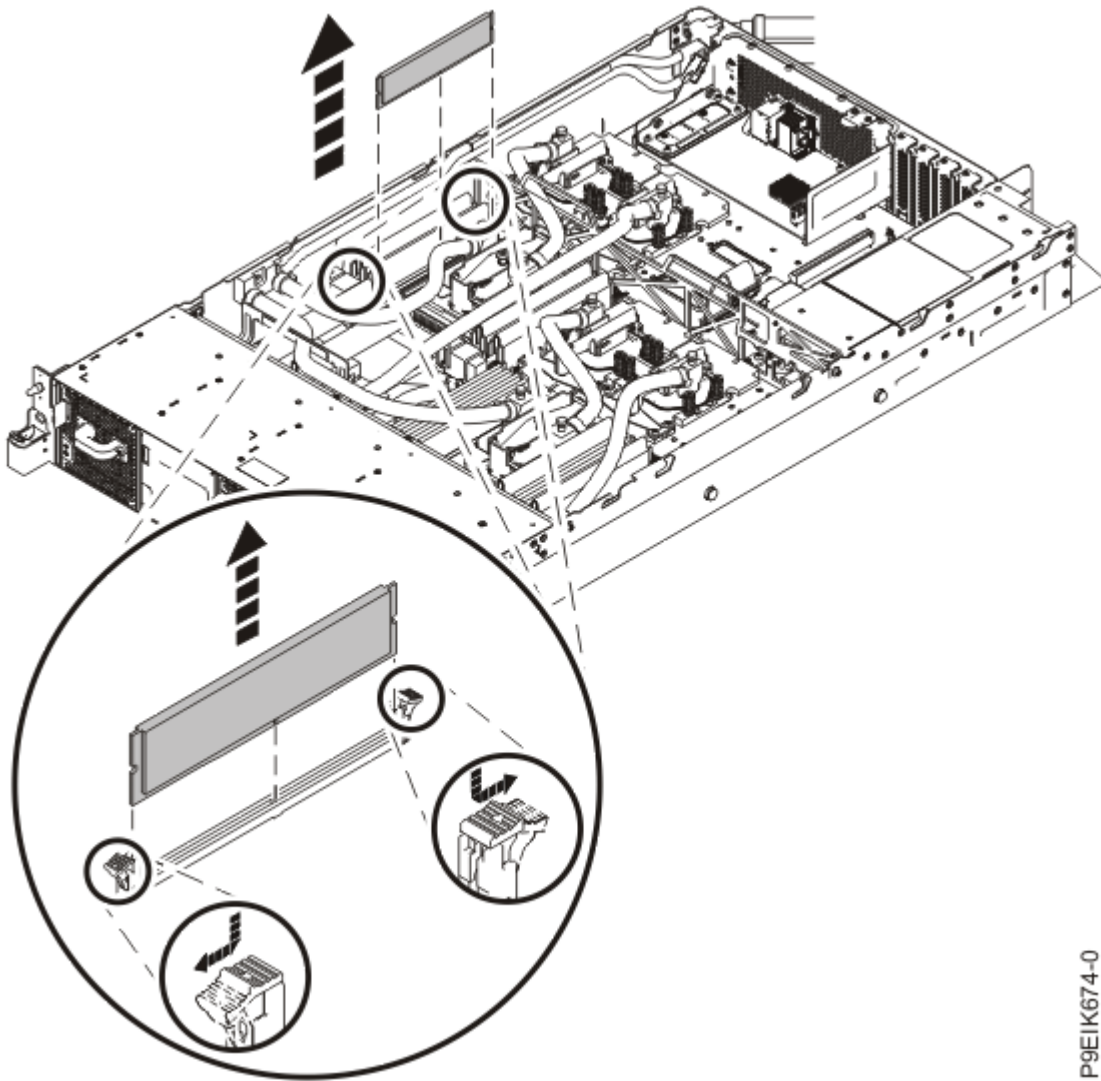


Figure 94. Location of the memory modules

4. Remove the memory module from the slot.

a) Unlock the memory module by pushing the locking tabs away from the memory module, in the direction shown in [Figure 95](#) on page 105.

The lever action of opening the tabs pushes the memory module out of the slot.



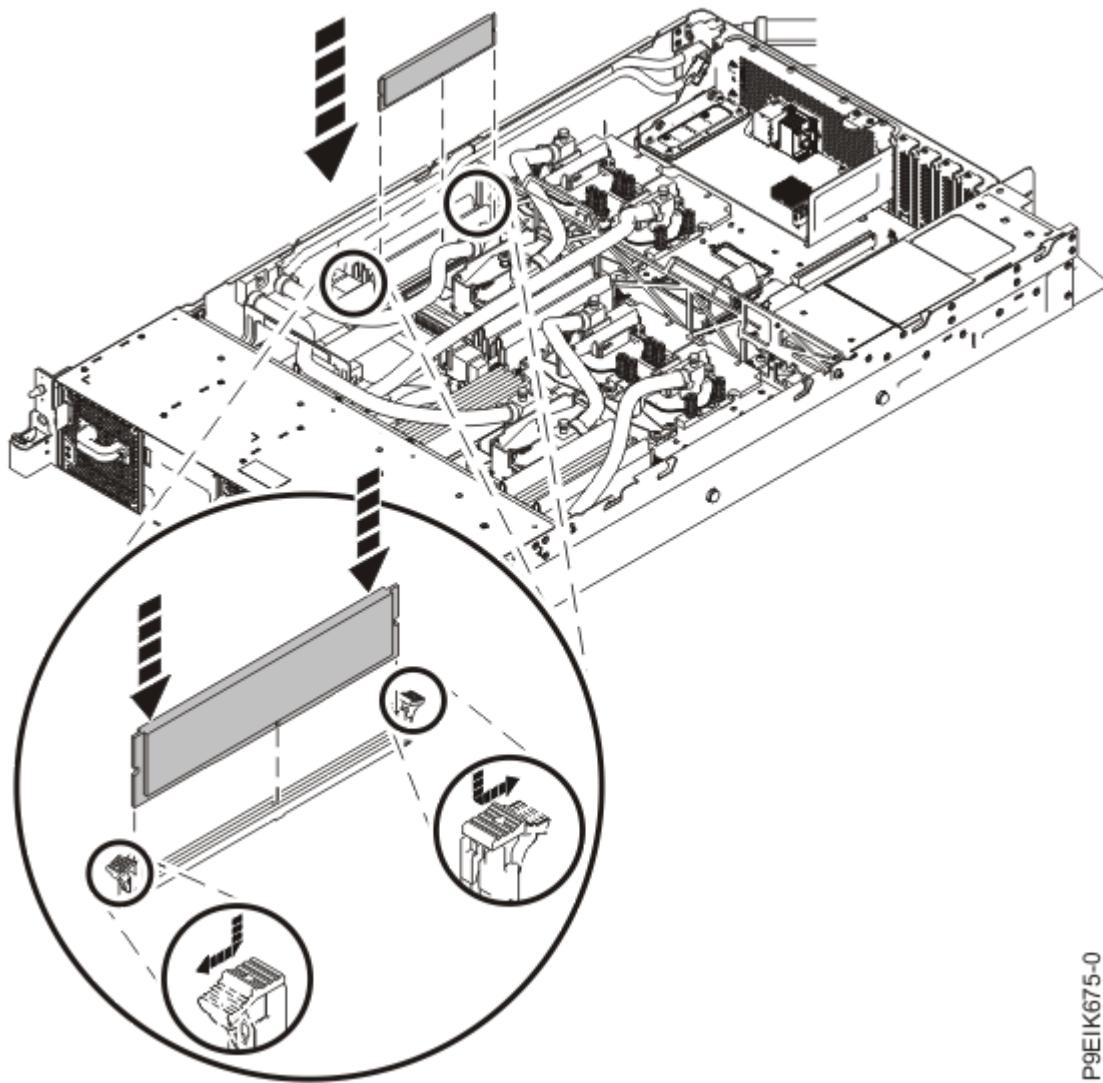
P9EIK674-0

Figure 95. Removing a memory module

- b) Hold the memory module by the edges and pull it out of the slot.
5. Place the memory module on an ESD mat.

Replace:

6. To replace a memory module, complete the following steps:
- a) Push the locking tabs to the open position, away from the slot, in the direction shown in [Figure 96](#) on page 106.



P9EIK675-0

Figure 96. Replacing a memory module

b) Grasp the memory module along its edges and align it with the slot.



Attention: The memory module 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 module until the locking tab locks in place with an audible click.

7. Replace the air baffles **(A)** and **(B)** as shown in [Figure 97 on page 107](#).

Carefully move the baffles around the hoses.

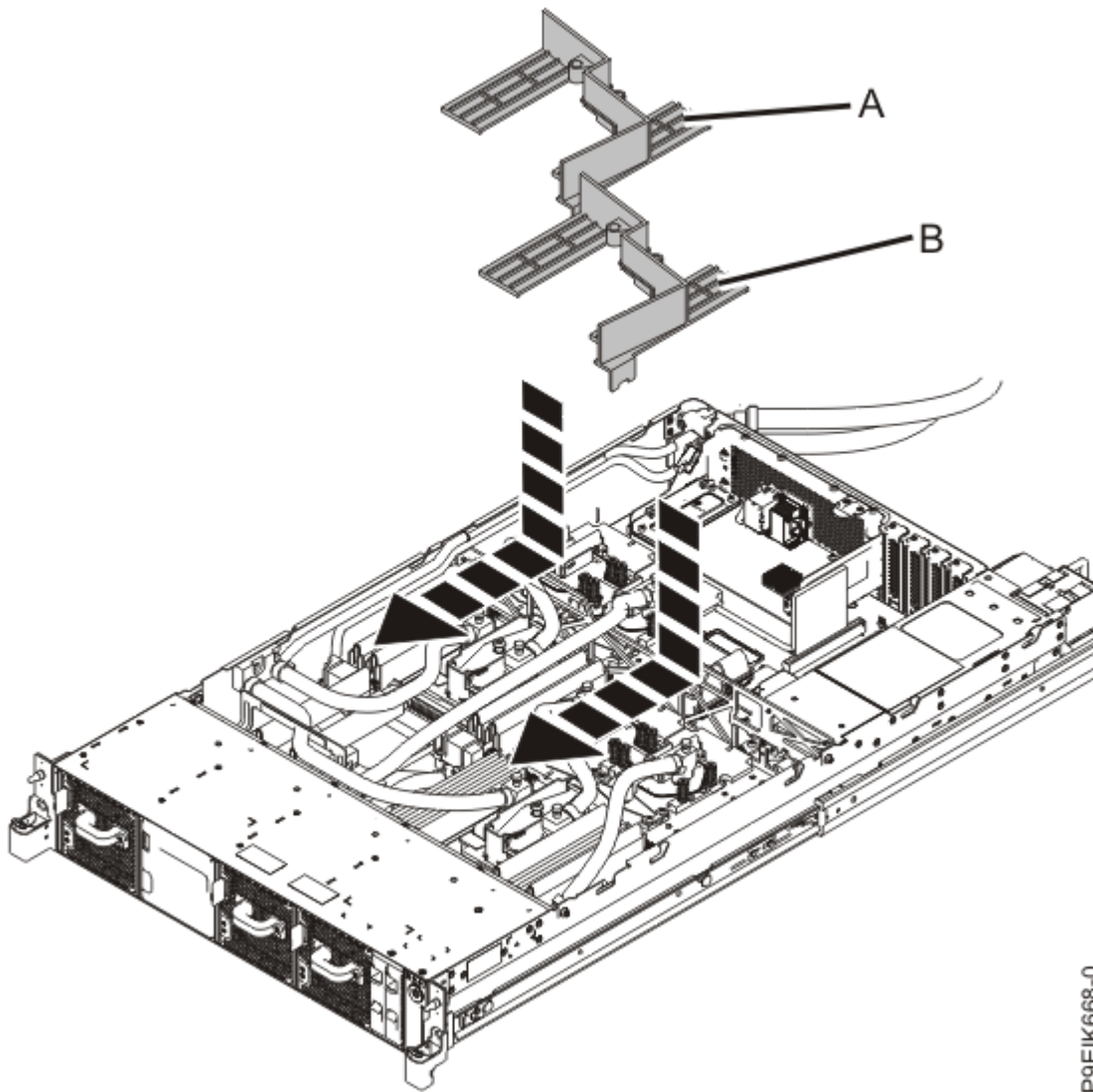


Figure 97. Replacing the memory air baffles

What to do next

Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Memory plugging rules in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn the memory placement rules for the system.

The system has memory configurations of 128 GB, 256 GB, 512 GB, 1024 GB, or 2048 GB. All memory modules must be installed and must be of the same size and type. The system has a total of 16 memory modules. The supported memory module sizes are either 8 GB, 16 GB, 32 GB, or 128 GB. Mixing of memory module feature codes is not allowed.

Table 1 on page 107 lists the supported memory feature codes.

<i>Table 1. Memory feature codes</i>	
Supported feature codes (FC)	Size
EM60	8 GB

<i>Table 1. Memory feature codes (continued)</i>	
Supported feature codes (FC)	Size
EM61	16 GB
EM63	32 GB
EM64	64 GB
EM65	128 GB

Removing and replacing PCIe adapters in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn about removing and replacing Peripheral Component Interconnect (PCI) Express (PCIe) adapters in the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) 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 baffles are present.

Removing a PCIe adapter from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove PCIe adapters, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page [216](#).

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 baffles are present.

Procedure

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

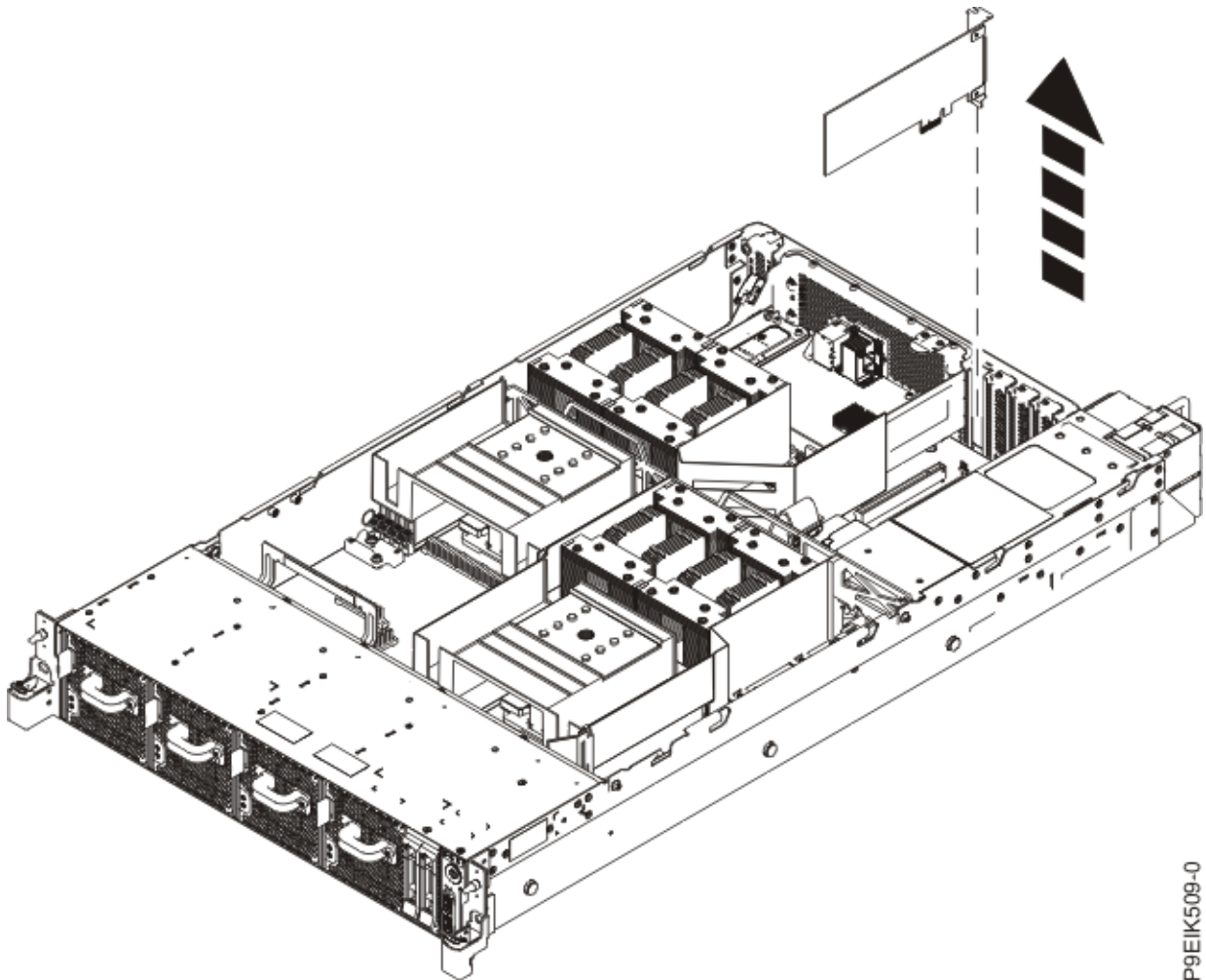
The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
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 by lifting the adapter.



P9EIK509-0

Figure 98. Removing a PCIe adapter

4. Place the PCIe adapter on an ESD mat.

Replacing a PCIe adapter in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace PCIe adapters, complete the steps in this procedure.

About this task

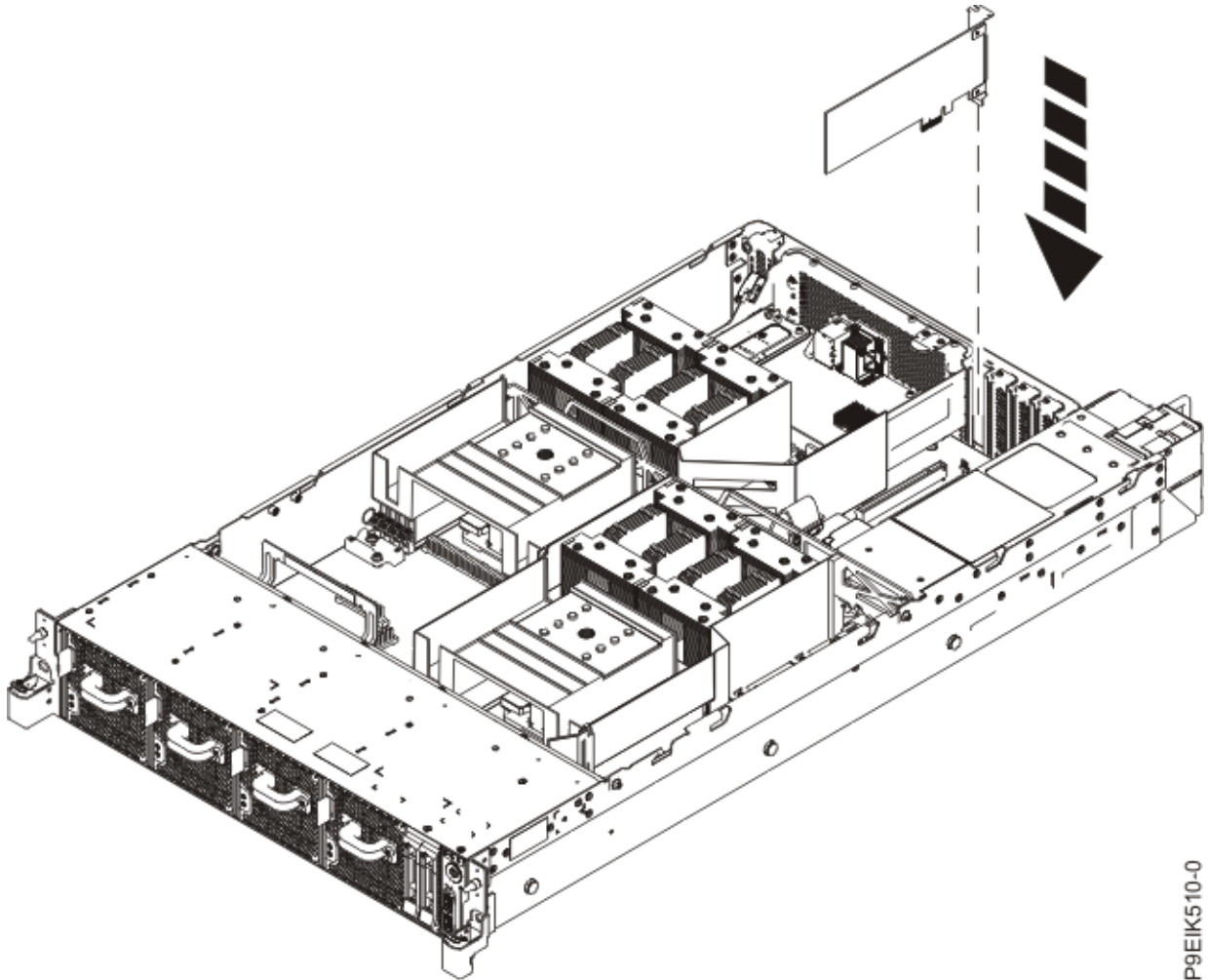


Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that:

- PCIe tailstock fillers are present.
- Graphic processor unit (GPU) airflow baffles are present.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Insert the replacement PCIe adapter into the system backplane as shown in [Figure 99](#) on page 110, aligning the adapter properly and inserting it fully into the slot.



P9EIK510-0

Figure 99. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

Removing and replacing a power supply in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Find information about removing and replacing power supplies in the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Removing a power supply from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace a power supply, complete the steps in this procedure.

About this task

If one of the power supplies failed on a system with four GPUs, the power supply can be replaced while the system is running.

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.

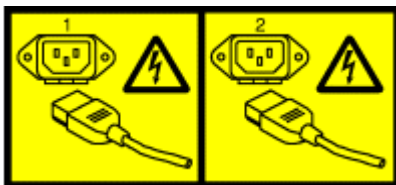


Attention:

- 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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Disconnect the power source from the system by unplugging the system. For instructions, see [“Disconnecting power cords from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 232.](#)

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)



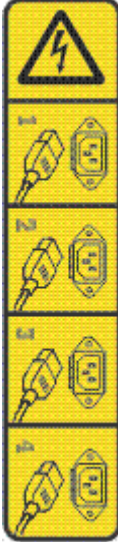
or



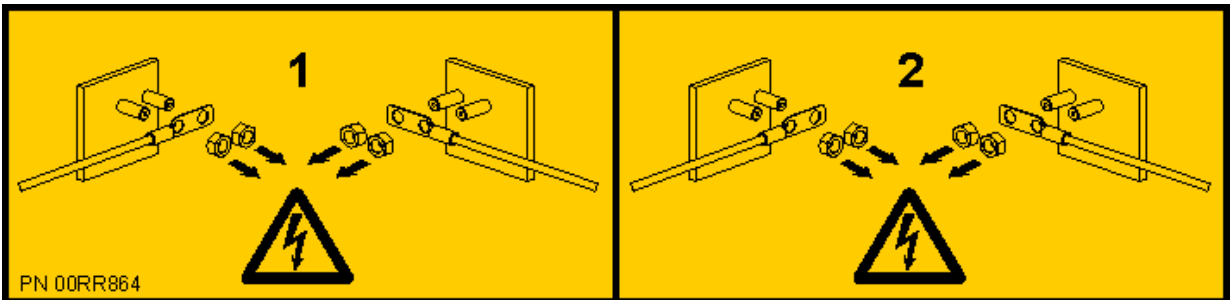
or



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)

3. Remove the power supplies from the system as shown in [Figure 100](#) on page 113.
 - a) To release a power supply from its position in the system, pull the locking-tab **(A)** to the left.
 - b) Grasp the power supply handle with one hand, and pull the power supply **(B)** partially 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.
 - d) Repeat steps “3.a” on page 113 - “3.c” on page 113 for the other power supply.

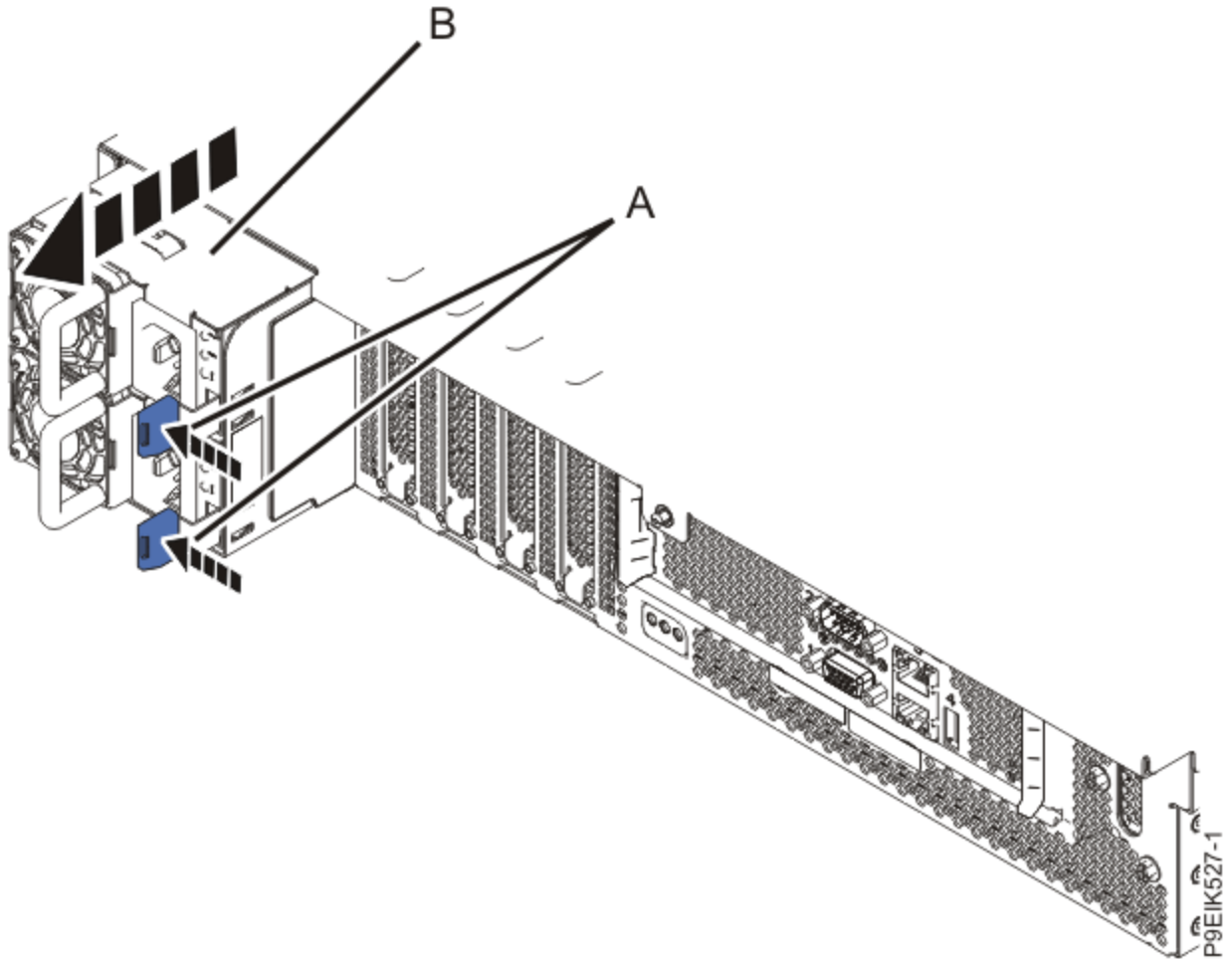


Figure 100. Removing the power supplies from the system

Replacing a power supply in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove a power supply, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Replace the power supplies as shown in [Figure 101](#) on page 114.
 - a) Place your other hand underneath the power supply.
 - b) Align the power supply **(A)** with the bay with the fan to the left.
 - c) Slide the power supply into the system until the latch **(B)** locks in place.
 - d) Repeat steps [“2.a”](#) on page 114 - [“2.c”](#) on page 114 for the other power supply.

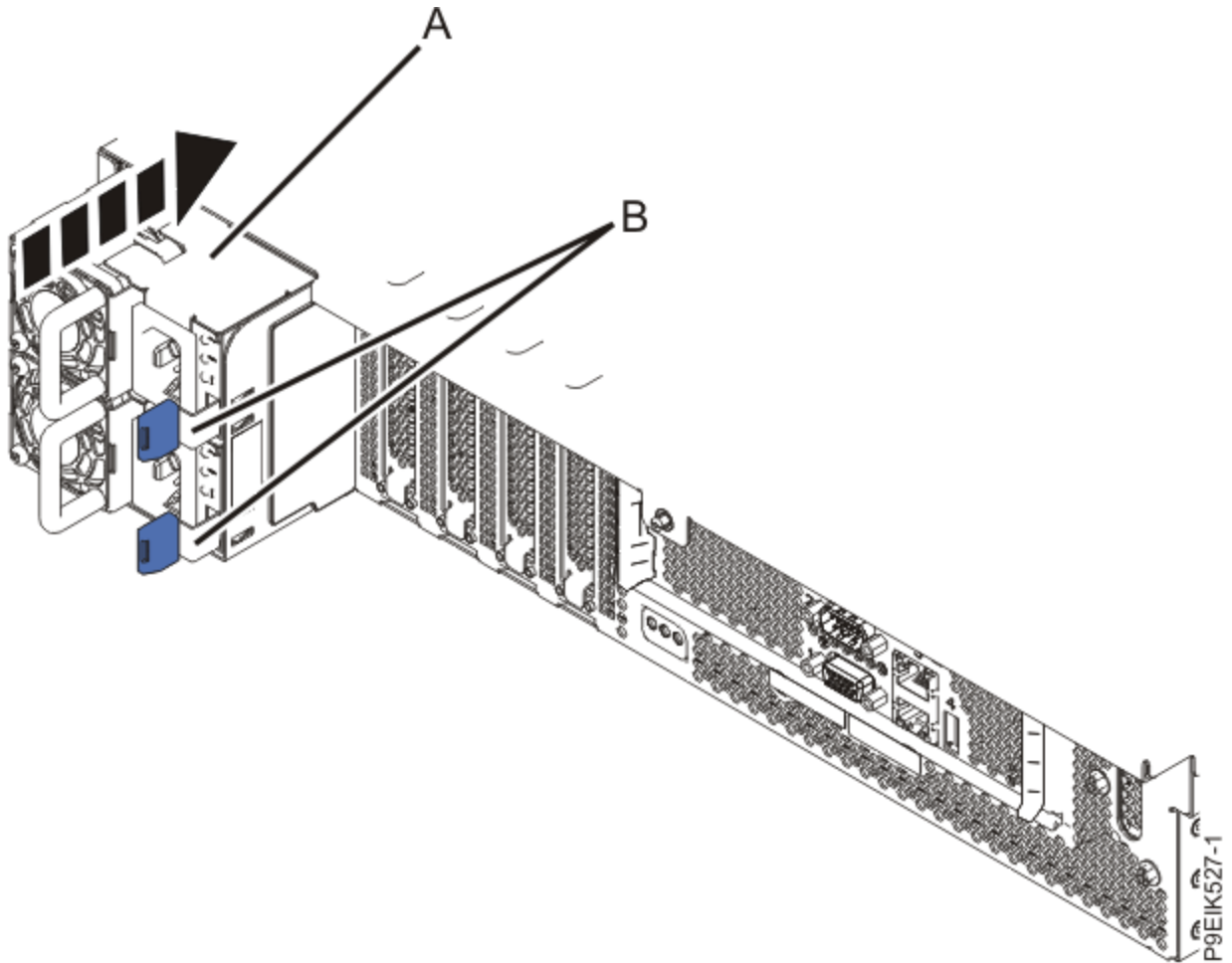


Figure 101. Replacing the power supplies in the system

3. Reconnect the power cords to the power supplies.

For instructions, see [“Connecting power cords to an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 235.

Removing and replacing the power switch and cable in the 8335-GTX system

Learn how to remove and replace the power switch and cable in the IBM Power System AC922 (8335-GTX) system.

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

To remove a power switch and cable, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

2. Remove the disk drive and fan card.

For instructions, see [“Removing the disk drive and fan card from the 8335-GTW or 8335-GTX system” on page 68.](#)

3. Locate the 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 102 on page 116.](#) Label each cable.

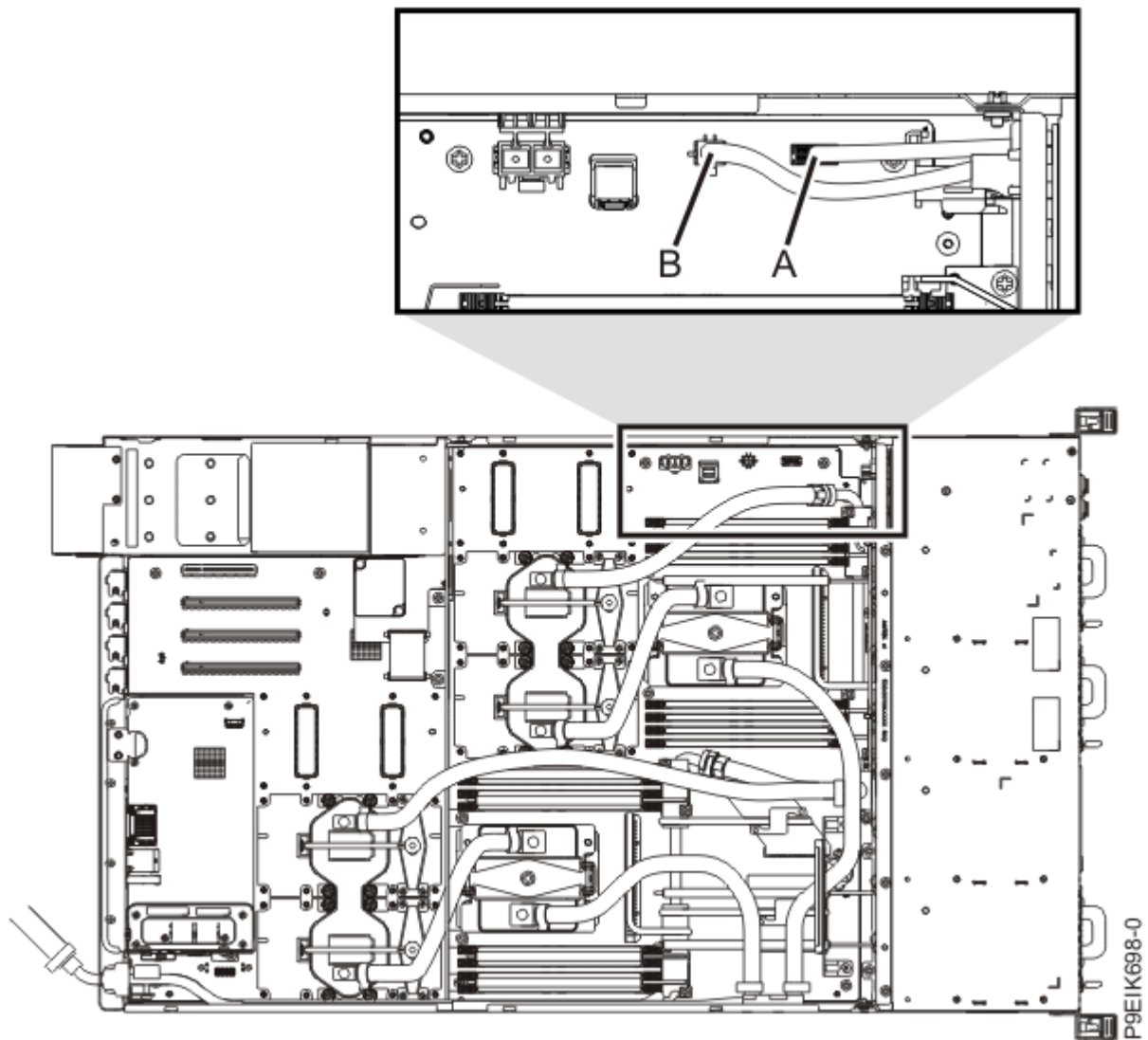
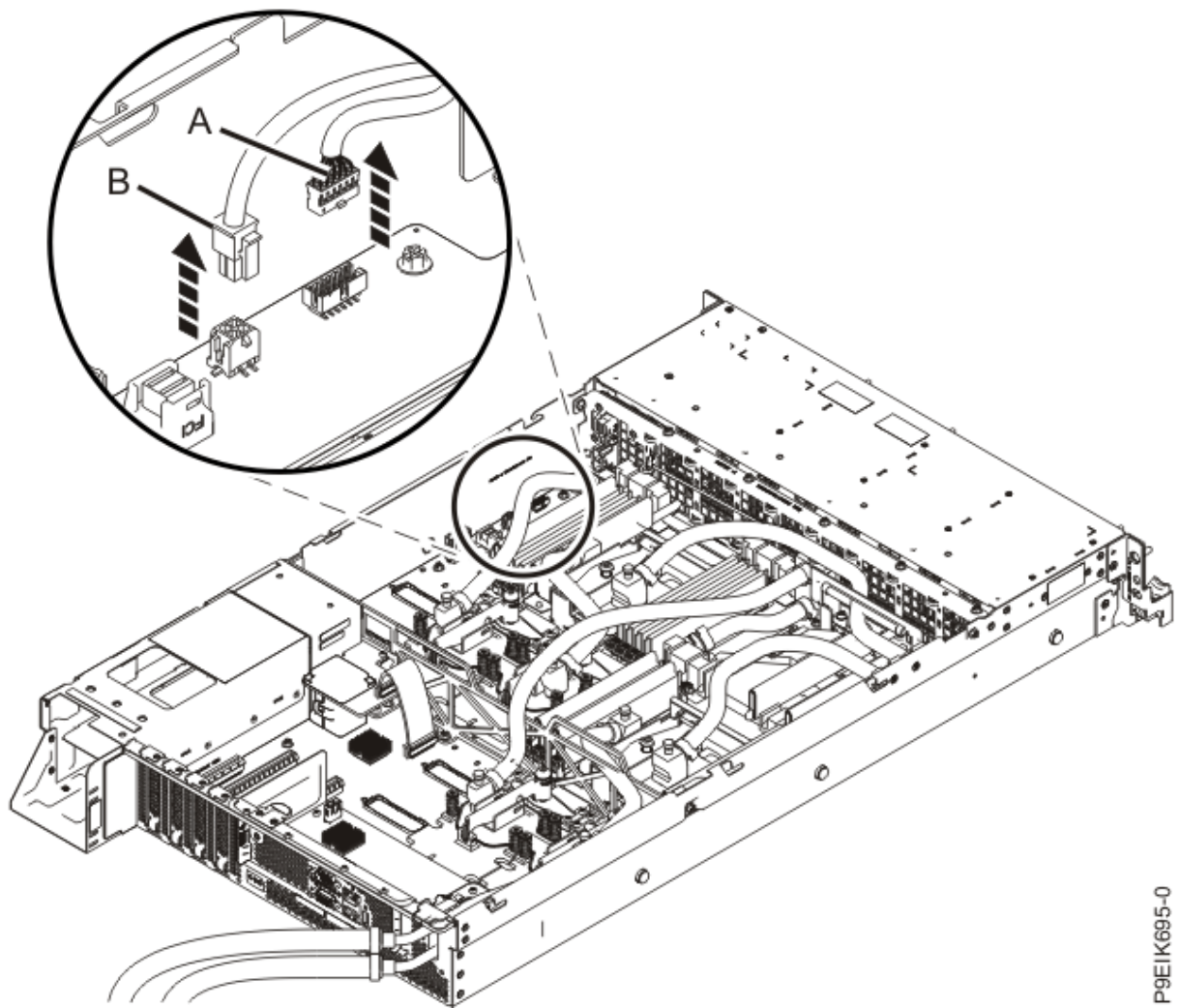


Figure 102. Location of the connectors for the USB cable and connector and the power switch and cable

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 power switch and cable **(A)** as shown in Figure 103 on page 117.

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



P9EIK695-0

Figure 103. Removing the power switch and cable from the system backplane

6. Remove the rack installation support from the side of the system as shown in [Figure 104](#) on page [118](#).

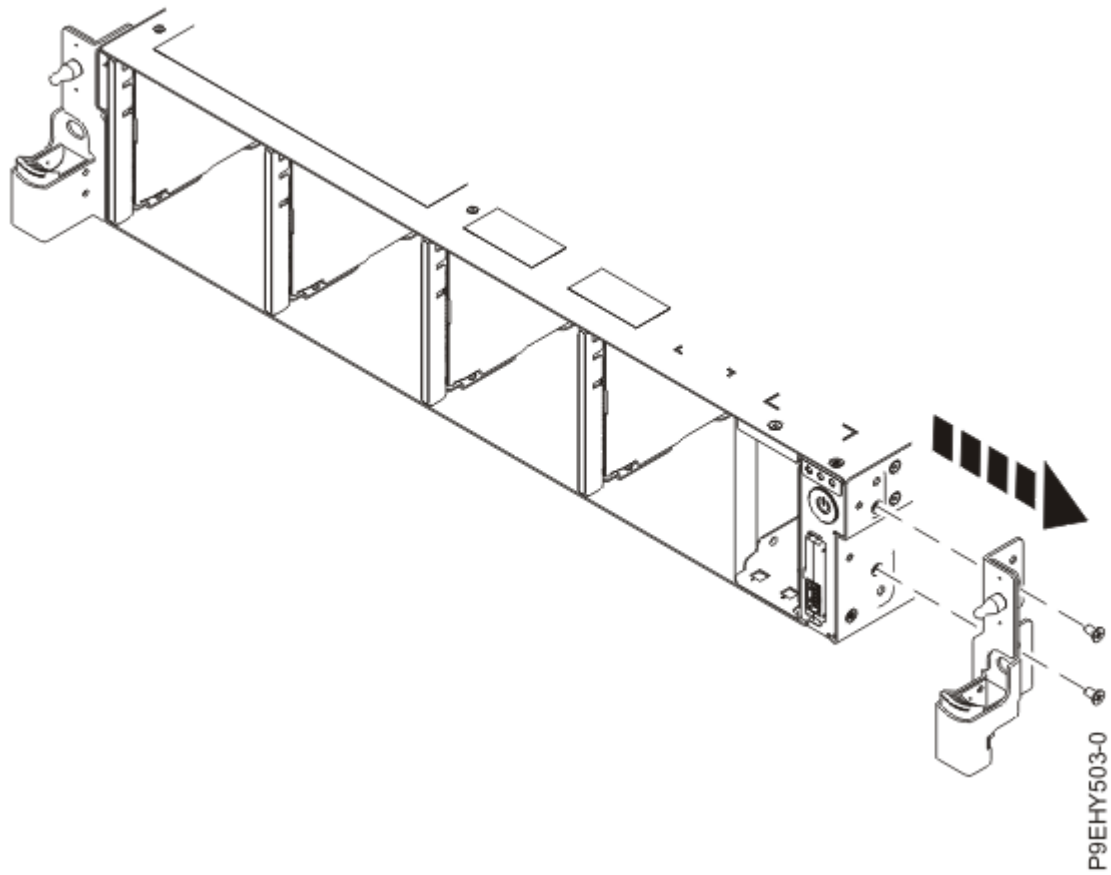


Figure 104. Removing the rack installation support

7. Remove the top and side screws from the power switch as shown in [Figure 105 on page 119](#).

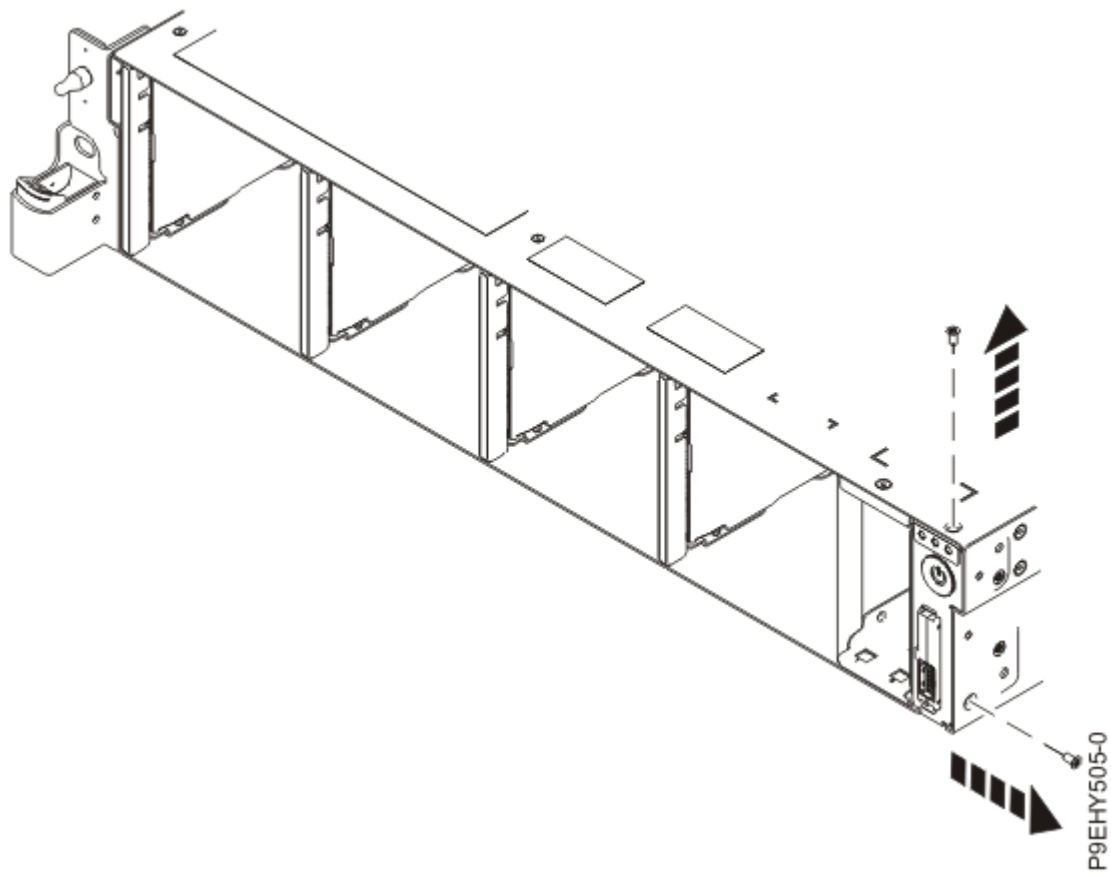


Figure 105. Remove the top and side screws

8. Pull the power switch from the system as shown in [Figure 106](#) on page 120.

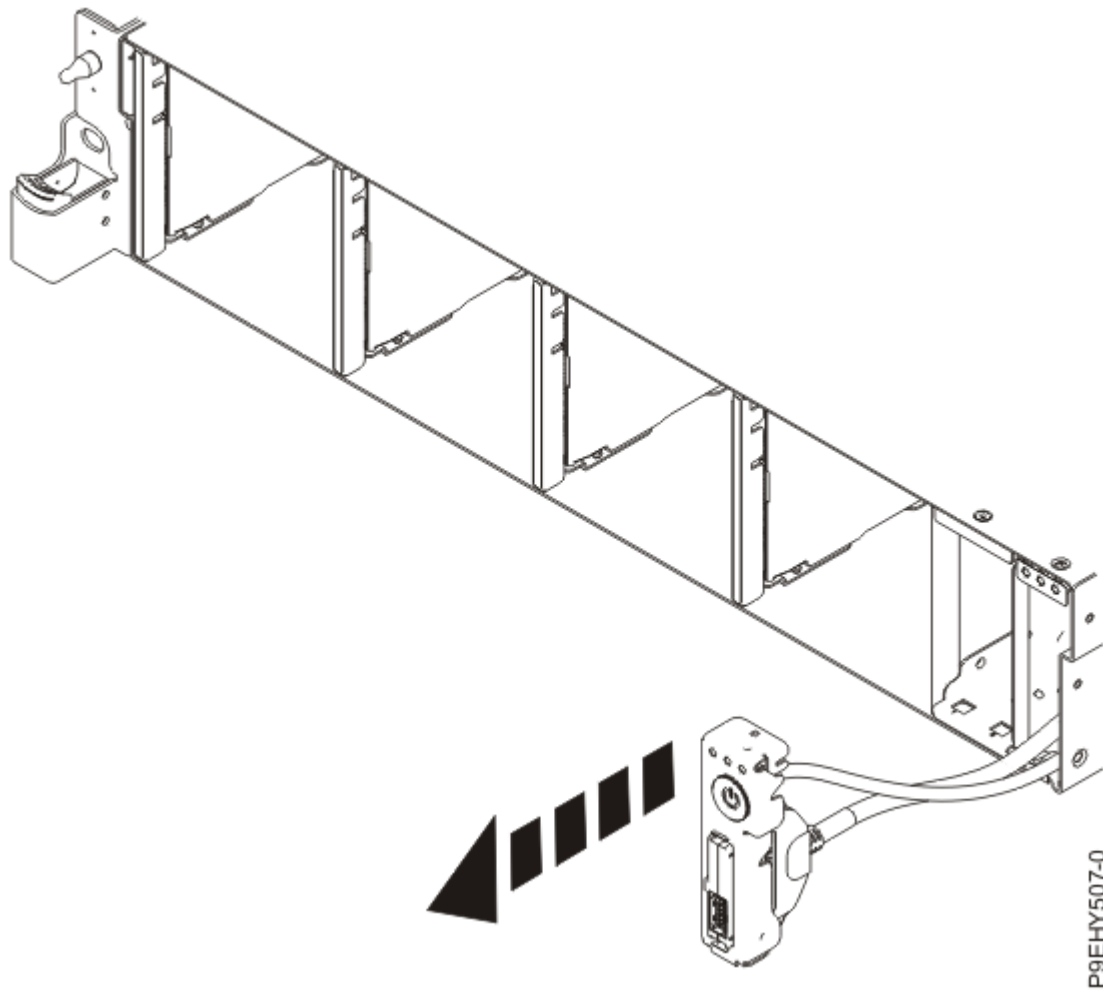


Figure 106. Pull out the power switch and cable

9. Pressing the latch releases **(A)** on the connector, disconnect the USB cable and connector from the power switch as shown in Figure 107 on page 120.

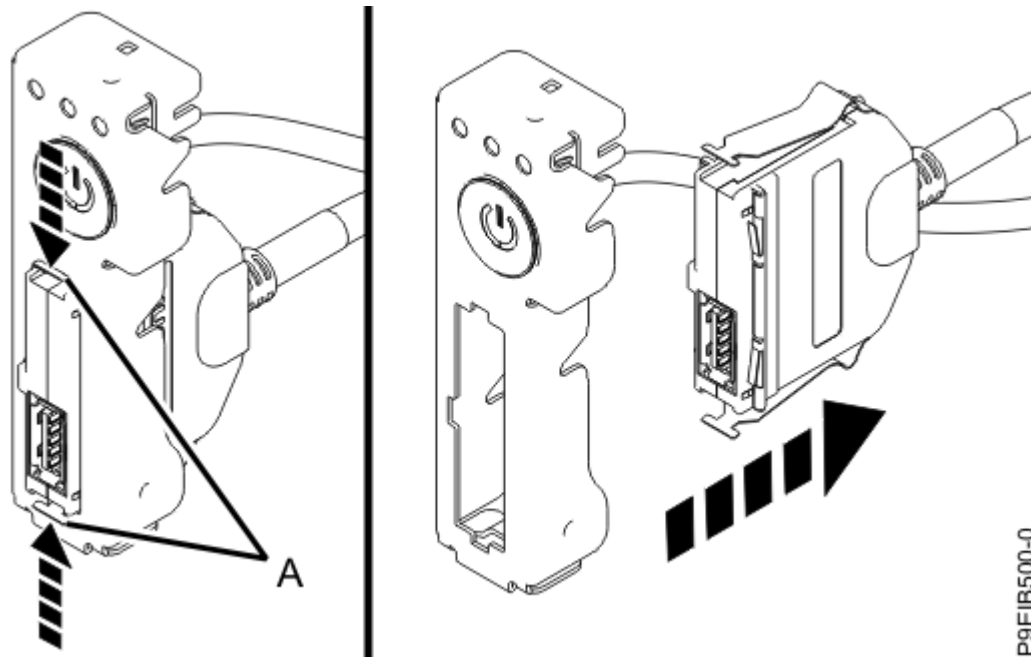


Figure 107. Removing USB cable and connector from the power switch

10. Place the USB cable and connector and the power switch and cable on the table.

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

To replace a power switch and cable, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Find the replacement power switch and cable and remove it from the protective plastic envelope.
3. While you press the latches **(A)** in, connect the USB cable and connector to the power switch as shown in [Figure 108](#) on page 121.

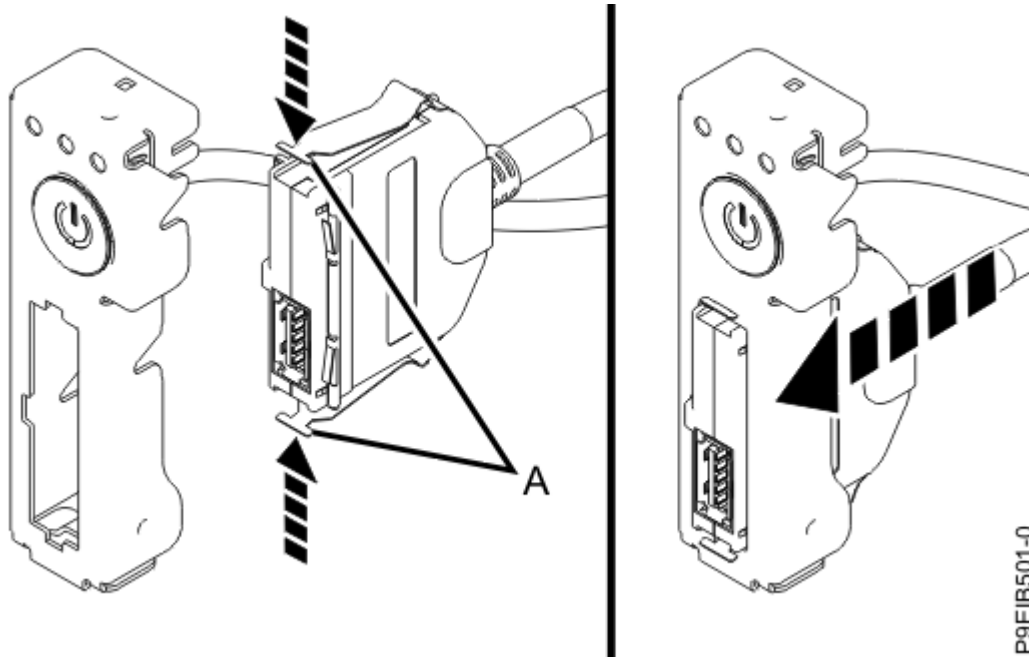


Figure 108. Attaching the USB cable and connector to the power switch

4. Insert the USB cable and the power switch and cable into the system as shown in [Figure 109](#) on page 122. Be careful to route the cables through to the system backplane.

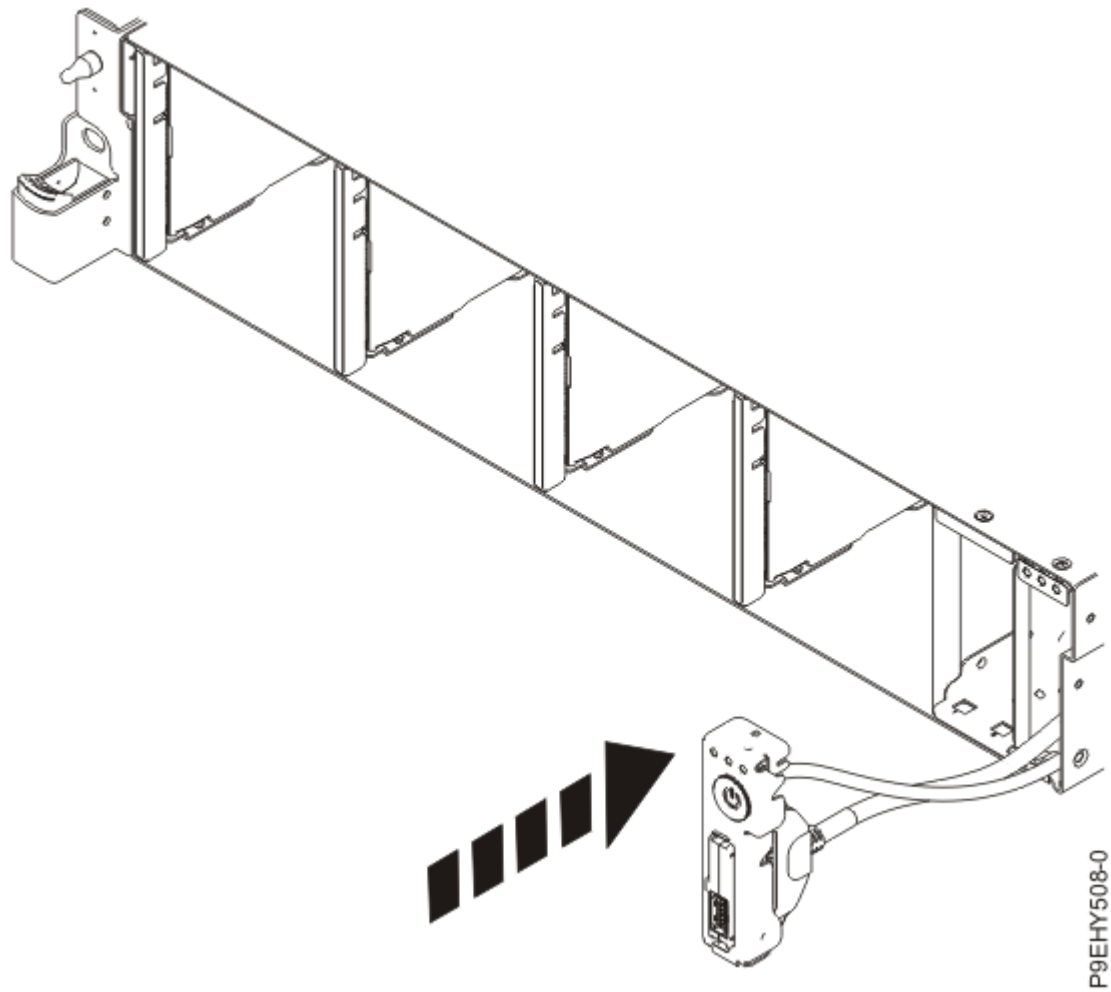


Figure 109. Replacing the front USB cable into the system backplane

5. Replace the top and side screws for the power switch as shown in [Figure 110](#) on page 123.

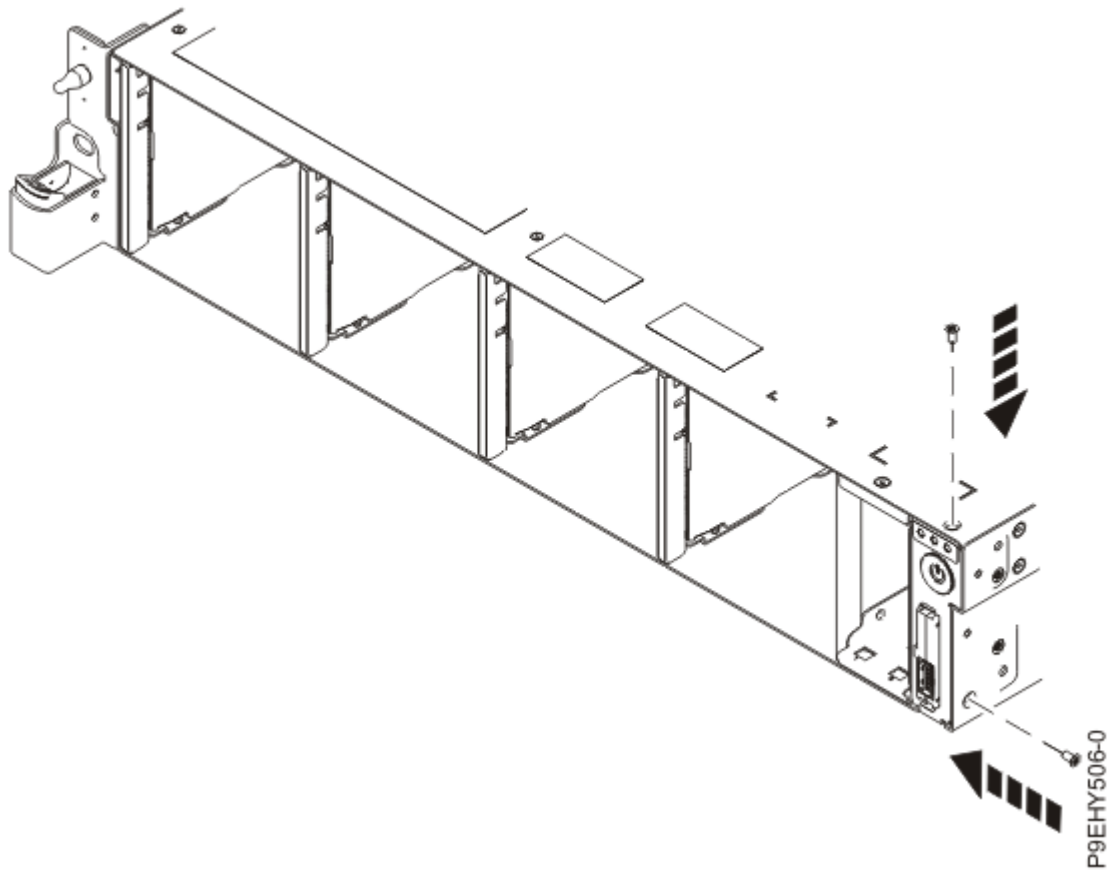
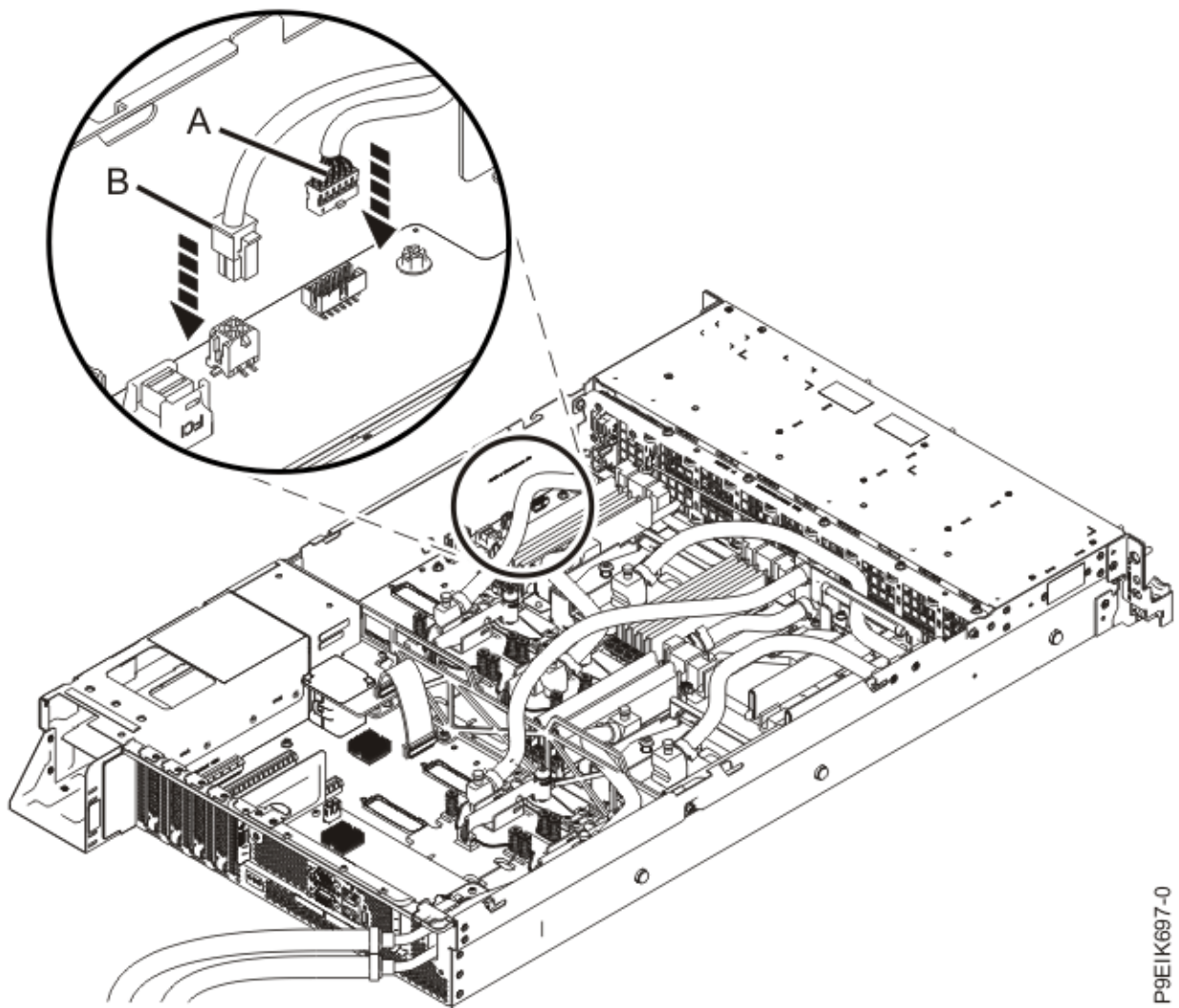


Figure 110. Replace the top and side screws

6. Using the labels, plug the USB cable **(A)** and the power switch and cable **(B)** to the system backplane as shown in [Figure 111](#) on page 124.

Ensure that the cable latch clip snaps into place on the connectors.



P9EIK697-0

Figure 111. Plugging in the cables

7. Replace the rack installation support on the side of the system as shown in [Figure 112](#) on page 125.

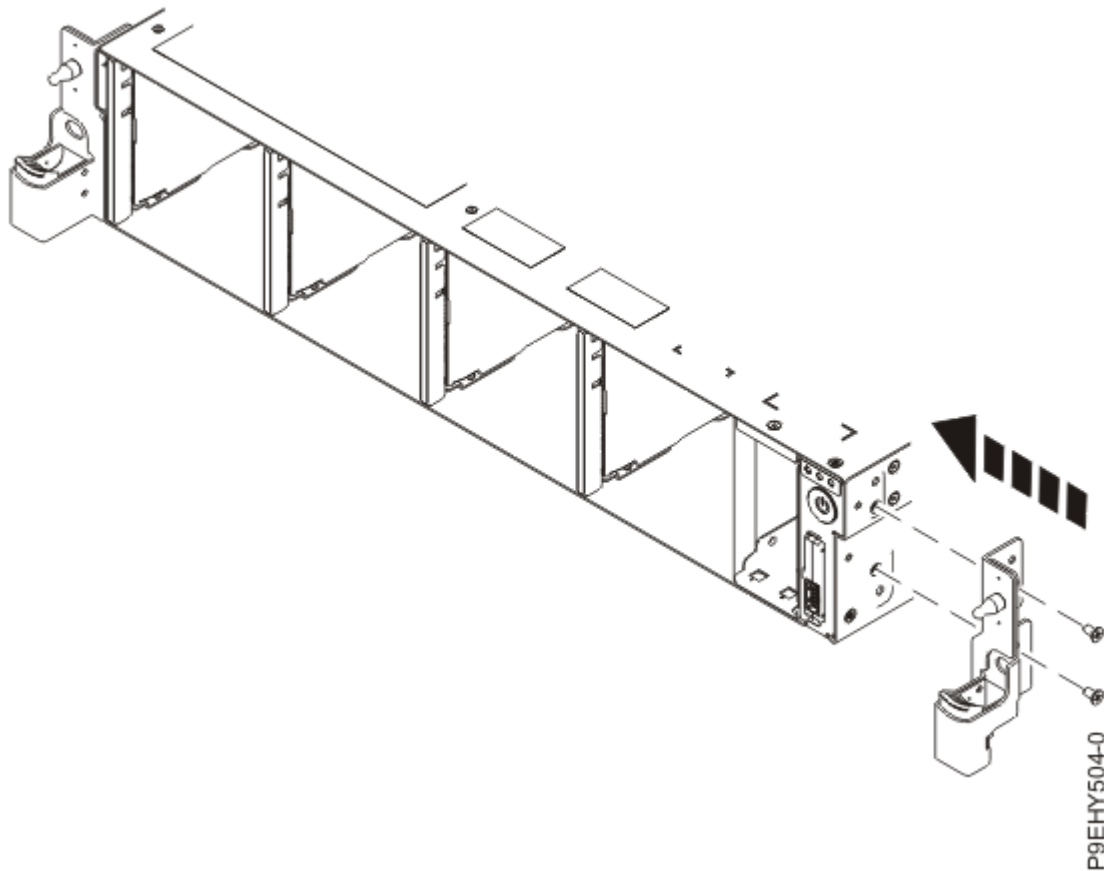


Figure 112. Replacing the rack installation support

8. Secure the 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-GTW or 8335-GTX system” on page 74.](#)

What to do next

Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.](#)

Removing and replacing the system backplane in the 8335-GTX

Learn how to remove and replace the system backplane in the IBM Power System AC922 (8335-GTX) system.

Preparing the 8335-GTX system to remove the system backplane

To prepare the 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 in the system backplane.

About this task

As part of the system backplane replacement, the cold plates are removed from the system processor modules and GPUs. Each module and GPU must have thermal interface material (TIM) between the module, the GPU, and the cold plate. If the processor TIM is damaged, it must be replaced. GPU TIMs must always be replaced. Ensure that you have spare TIMs available before proceeding.

Procedure

Power off the system and place it in the service position.

For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts”](#) on page 216.

Removing the system backplane from the 8335-GTX 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 in the system backplane.

Power off the system and place it in the service position. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts”](#) on page 216.

About this task

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

As part of the system backplane replacement, the cold plates are removed from the system processor modules and GPUs. Each module and GPU must have thermal interface material (TIM) between the module, the GPU, and the cold plate. If the processor TIM is damaged, it must be replaced. GPU TIMs must always be replaced. Ensure that you have spare TIMs available before proceeding.

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.

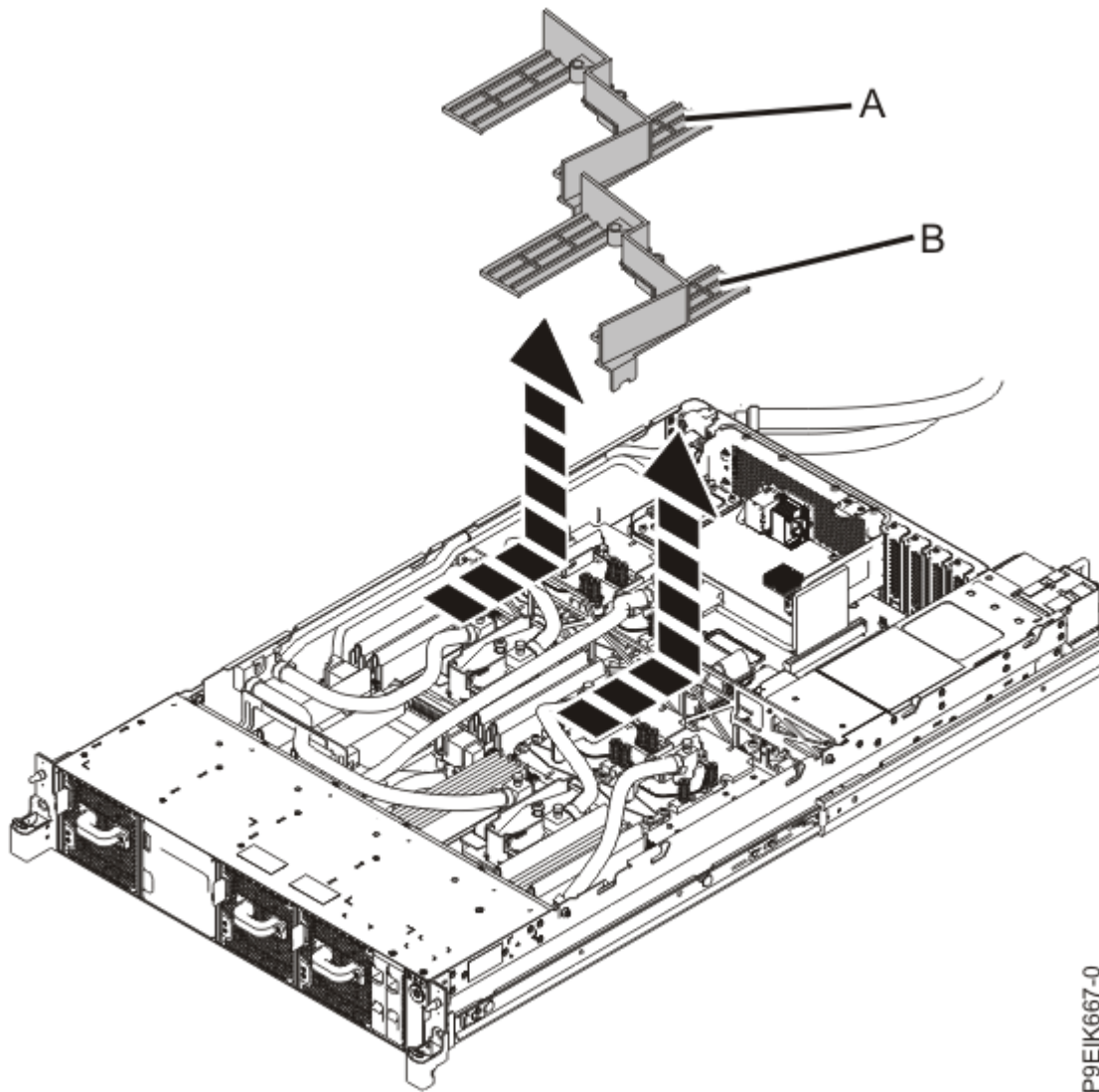


Attention:

- 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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

2. Remove the air baffles **(A)** and **(B)** as shown in [Figure 113](#) on page 127.

Carefully move the baffles around the hoses.



P9EIK667-0

Figure 113. Removing the memory air baffles

3. Remove the BMC card.

For instructions, see [“Removing the BMC card from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 2.](#)

4. Label and remove the PCIe adapters.

For instructions, see [“Removing a PCIe adapter from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 108.](#)

5. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 81.](#)

6. Label and remove the fan power cable from the system backplane.

For instructions, see [“Removing the fan power cable from the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 87.](#)

7. Label and remove the power switch and cable and the USB cable and connector from the system backplane.

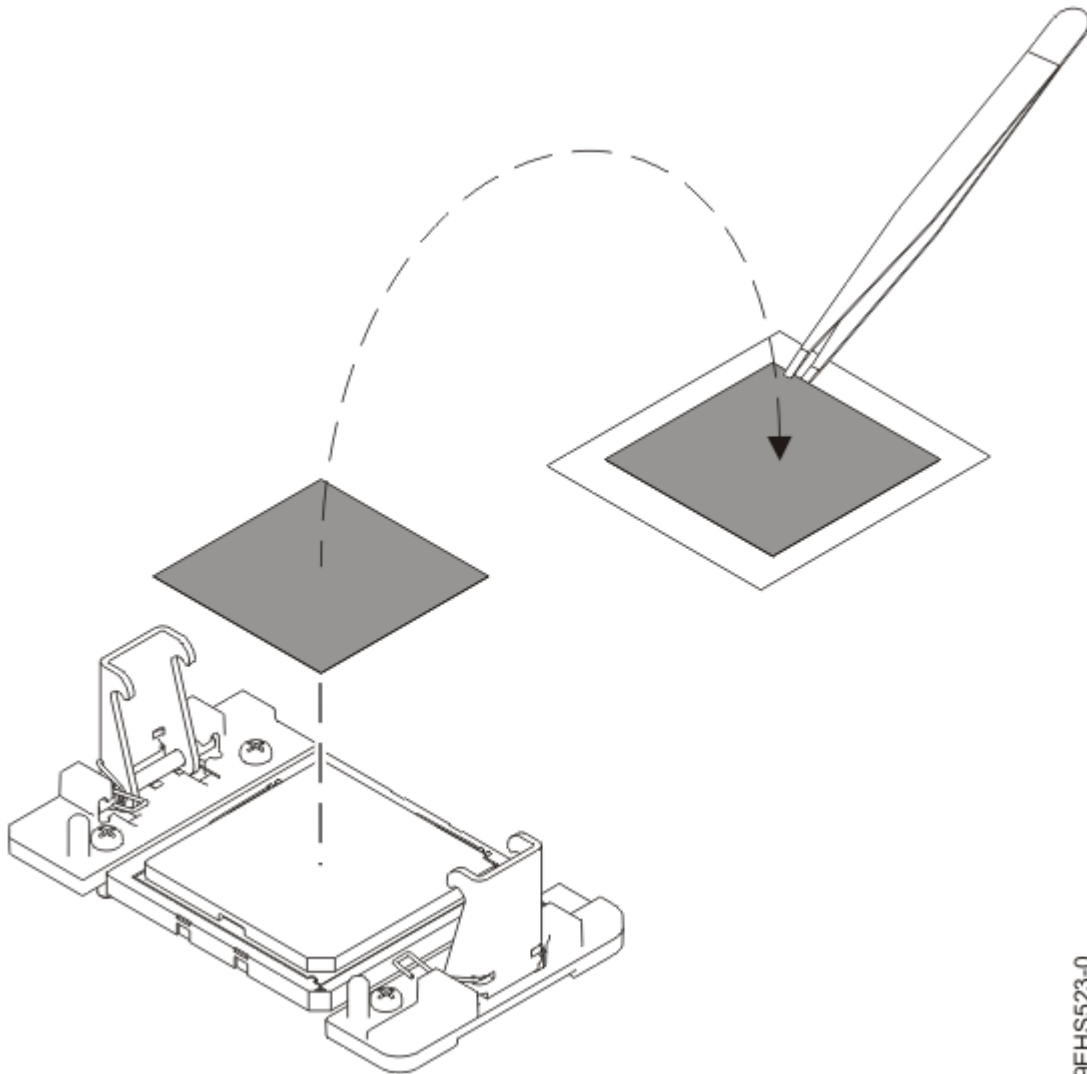
For instructions, see [“Removing the power switch and cable from the 8335-GTX system” on page 115](#)

8. Remove the cold plates.

For instructions, see [“Removing the cold plates from the 8335-GTW or 8335-GTX system” on page 8.](#)

- Using tweezers, carefully remove the TIM from the top of the system processor module and place it in a clean, dry area as shown in [Figure 114](#) on page 128.

The TIM can tear easily.



P9EHS523-0

Figure 114. Removing the TIM from the system processor module

- Remove dust and debris from the system processor module area.

If dust or debris is present, use the supplied air pump 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 115](#) on page 129. If your air pump is not assembled as shown in [Figure 115](#) on page 129, fasten the tip onto the bulb.

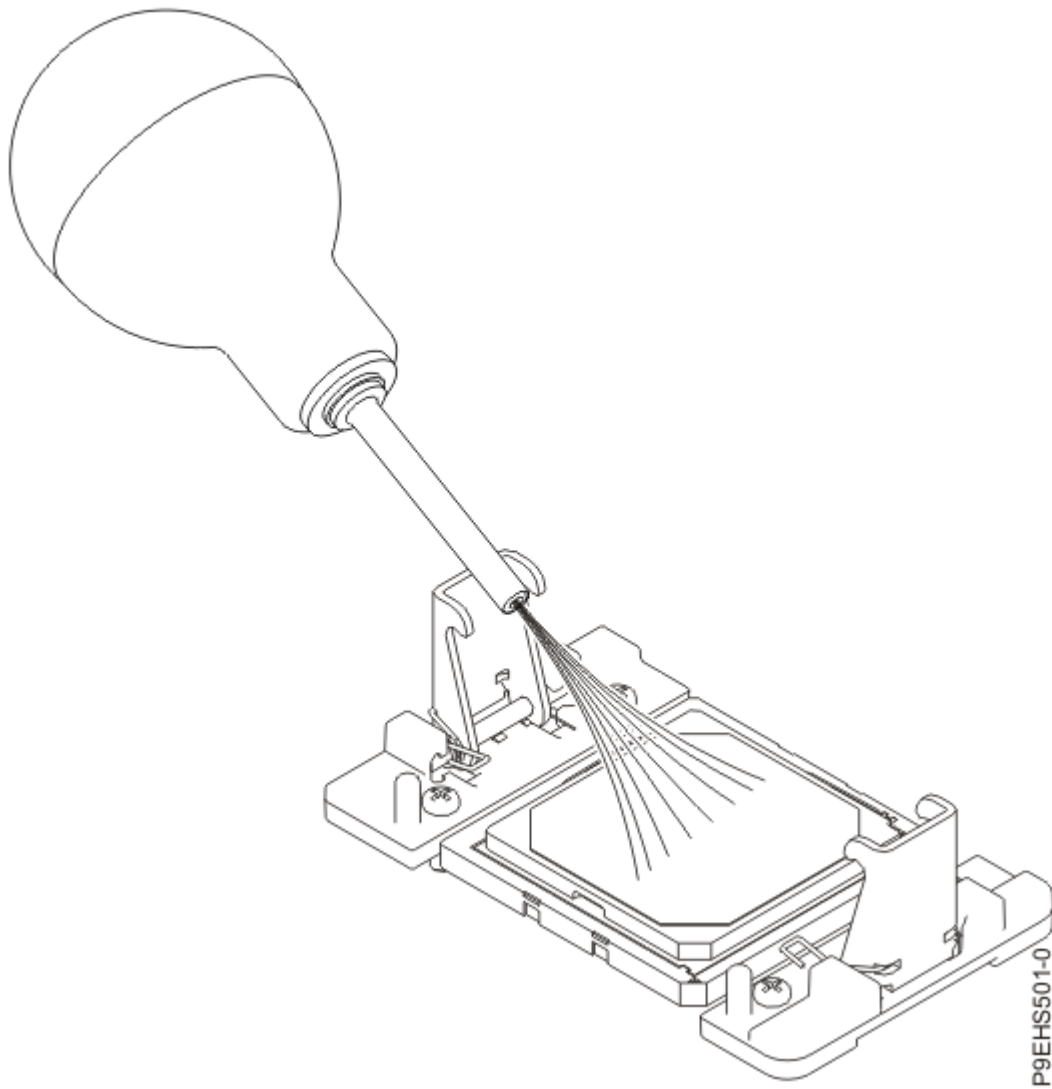


Figure 115. Removing dust and debris from the system processor module area

11. Prepare the system processor module for removal.

- a) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 116 on page 130](#).

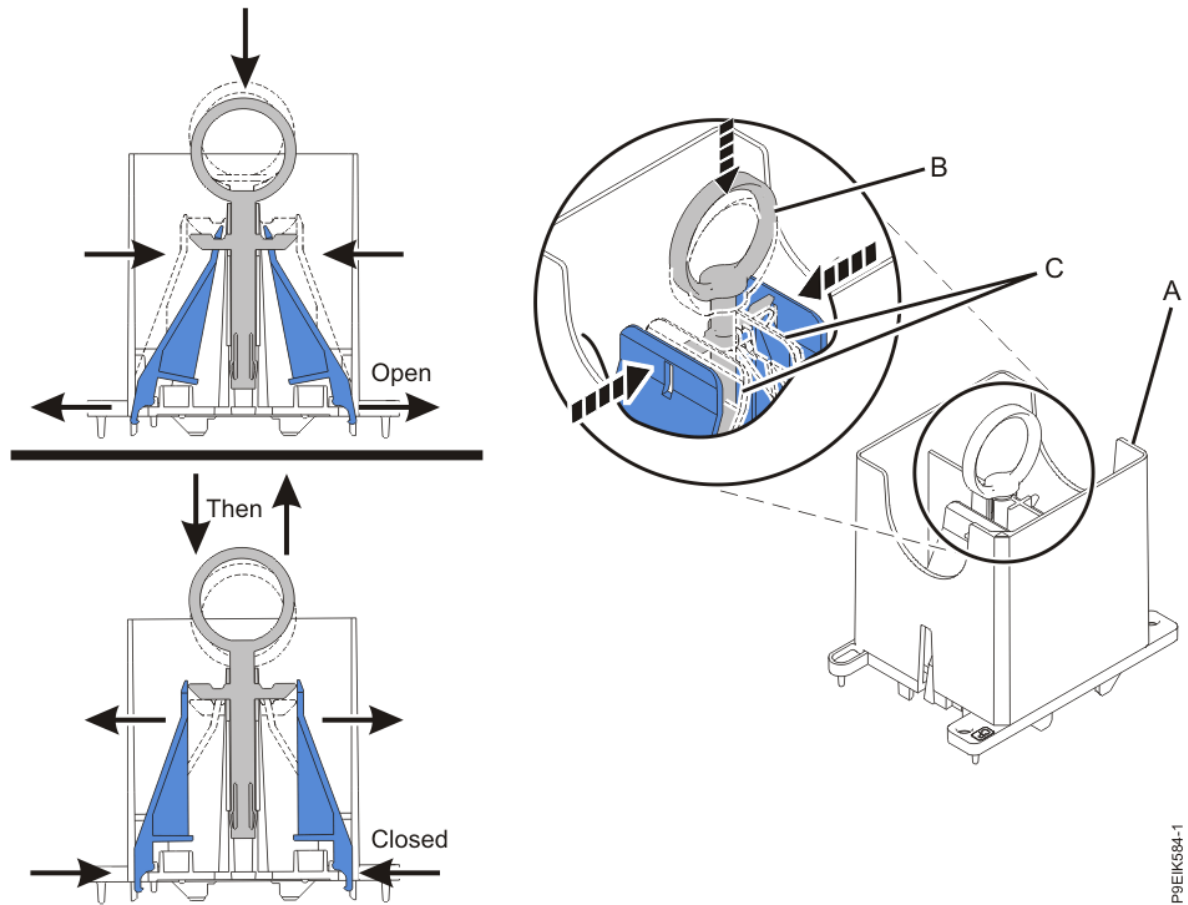
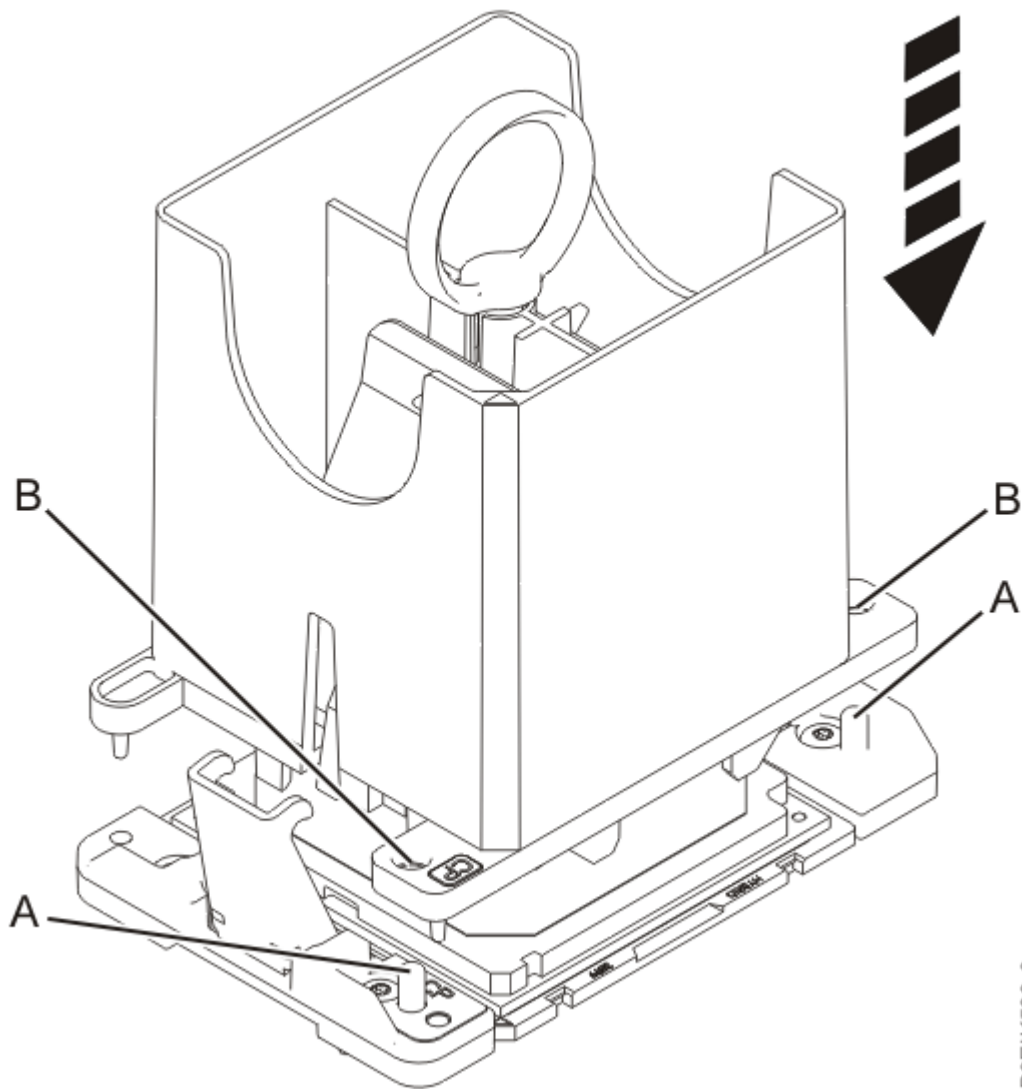


Figure 116. Opening the processor removal tool latches

- b) Lower the tool over the system processor module while ensuring that the two guide pins **(A)** insert into the alignment holes **(B)** on each side of the tool.

See [Figure 117](#) on page 131.

P9EIK584-1

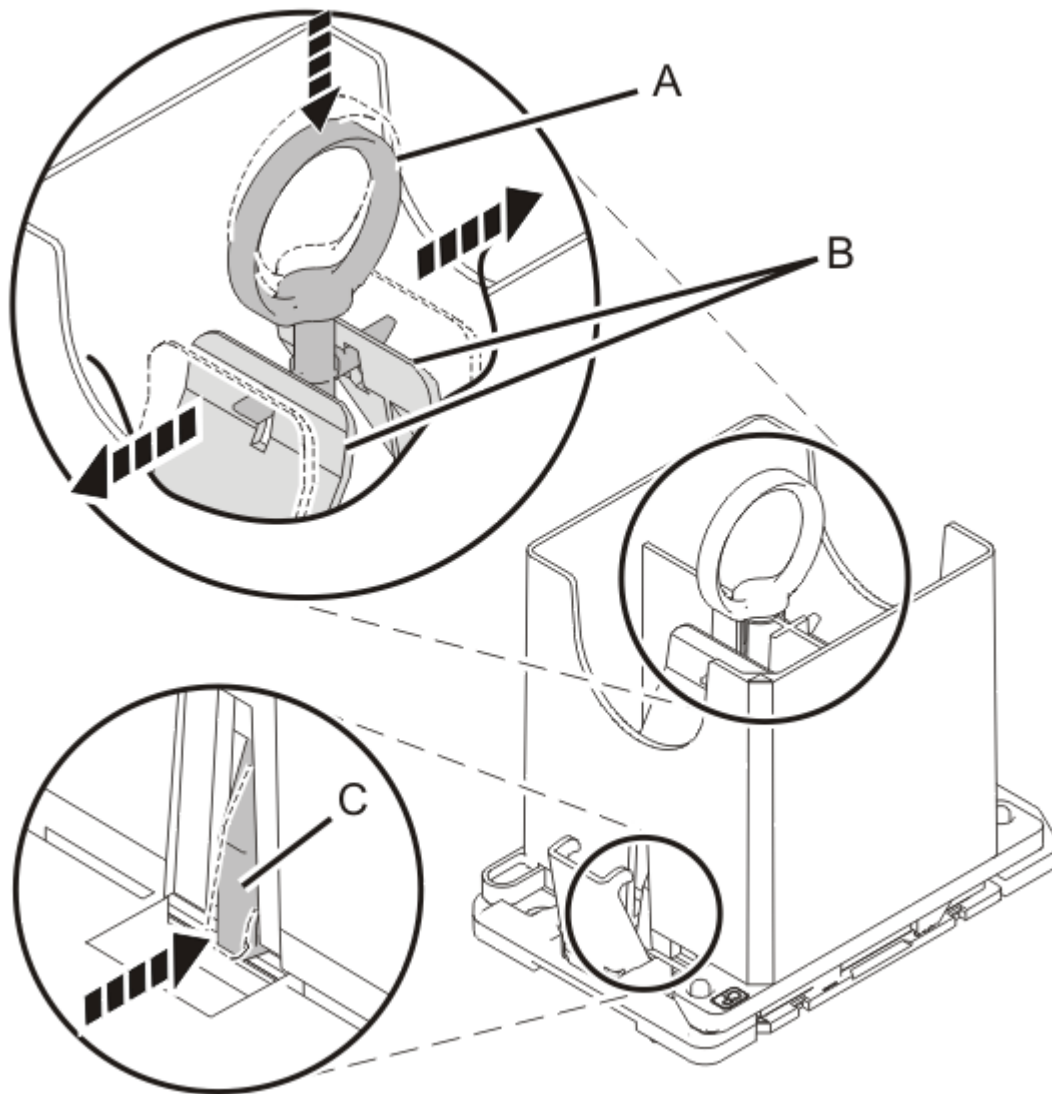


P9EIK583-0

Figure 117. Lowering the removal tool onto the system processor module

- c) With the removal tool sitting on top of the system processor module, push down on the ring **(A)** to close the latches **(C)** and lock the system processor module into the tool. Make sure that both of the tool jaws are locked on the system processor module.

See [Figure 118](#) on page 132.

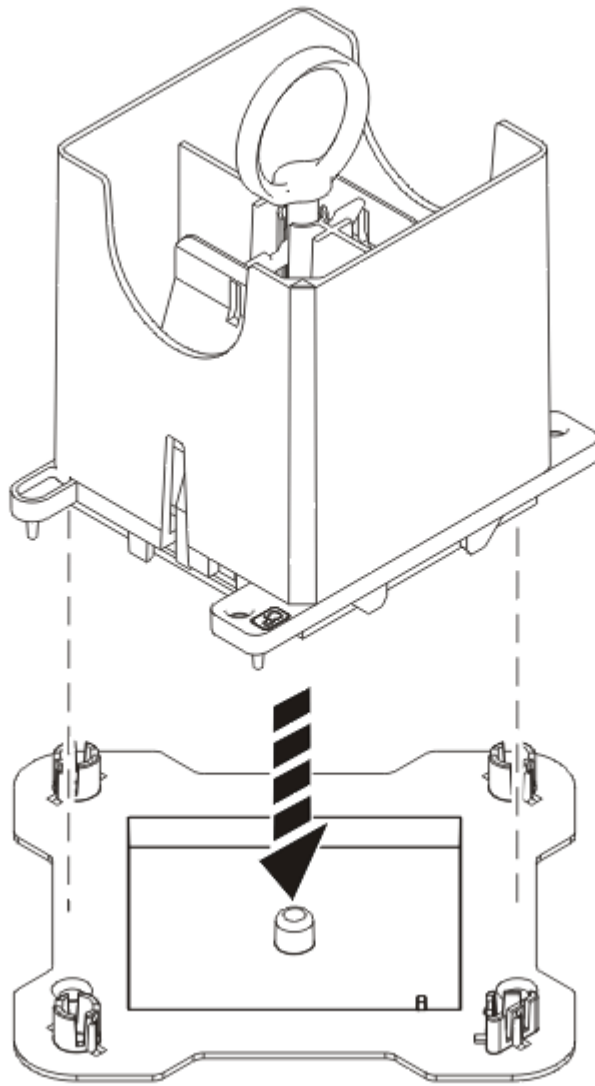


P9EIK581-0

Figure 118. Locking the system processor module into the tool

12. 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 119](#) on page 133.

Note: Set the tool and system processor module at an angle on the top cover of the system processor module packaging. That makes the module easier to pick up and place into the package.

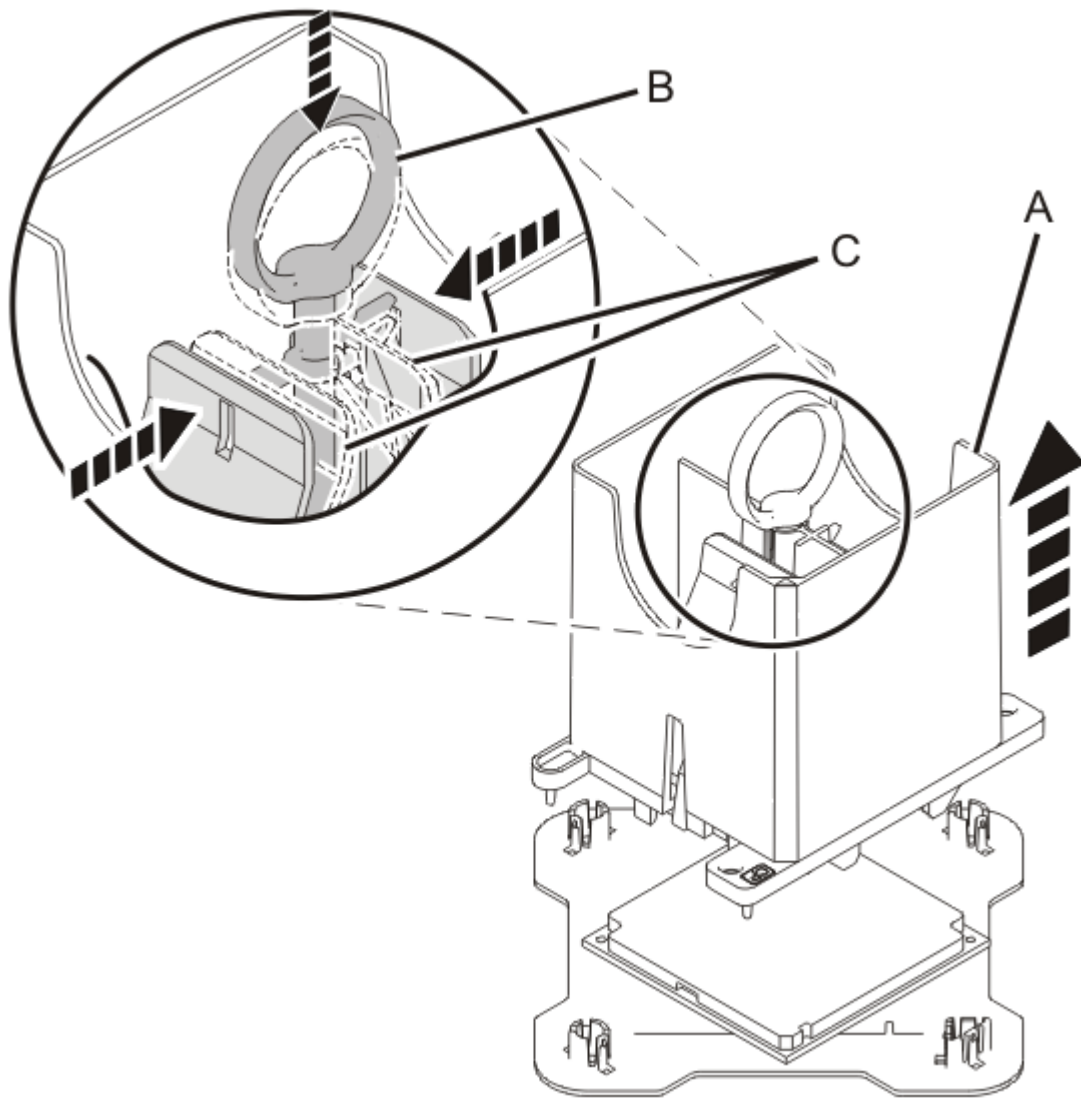


P9EIK588-0

Figure 119. Placing the tool at an angle on the top cover of the packaging

13. Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

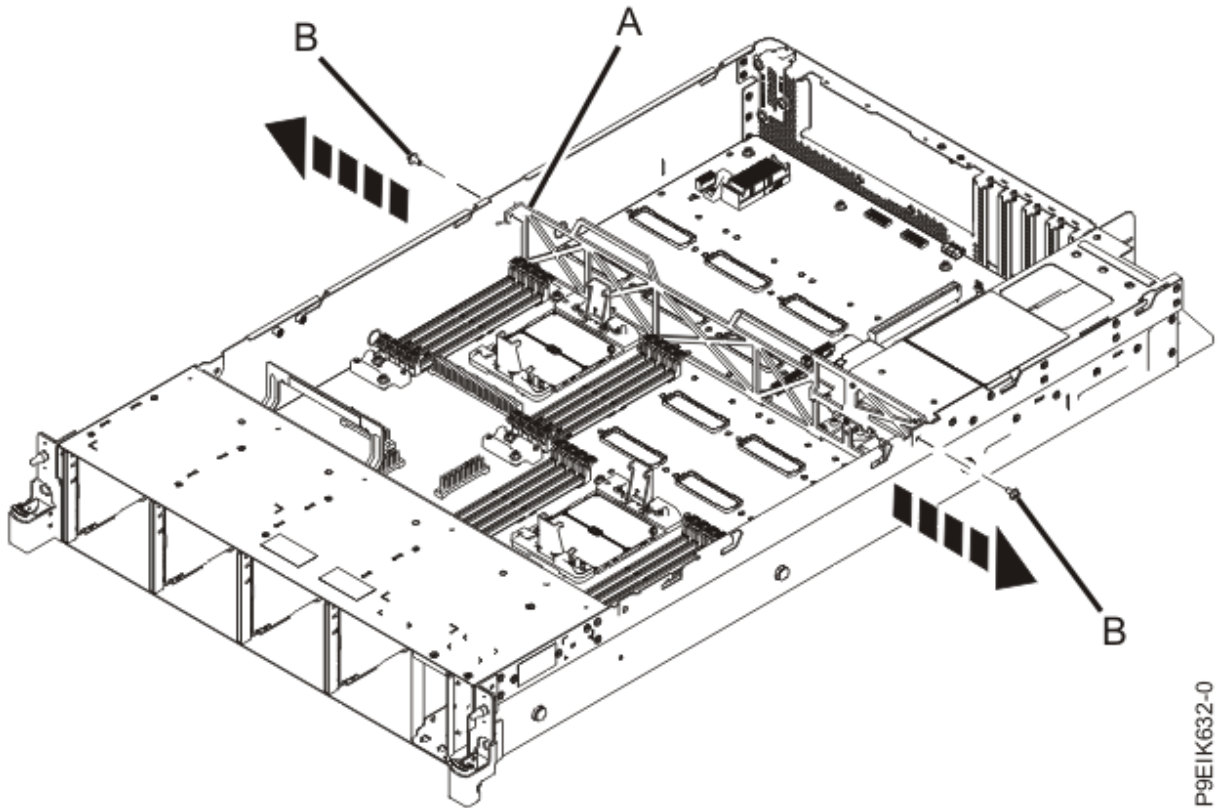
See [Figure 120](#) on page 134.



P9EIK585-0

Figure 120. Releasing the system processor module from the tool

14. Remove one screw (**B**) from each side of the middle support (**A**).
See [Figure 121](#) on page 135.



P9EIK632-0

Figure 121. Remove the middle support side screws

15. Unscrew and remove 22 screws at locations **(A)**, **(B)**, and **(C)** from the system backplane and supports.

The screw locations are shown in [Figure 122 on page 136](#). The screws at **(A)** are the shortest. The screws at **(B)** and **(C)** are longer and secure the pipe supports.

The three metal pipe supports at **(B)** and **(C)** need to be kept. They are used on the replacement system backplane.

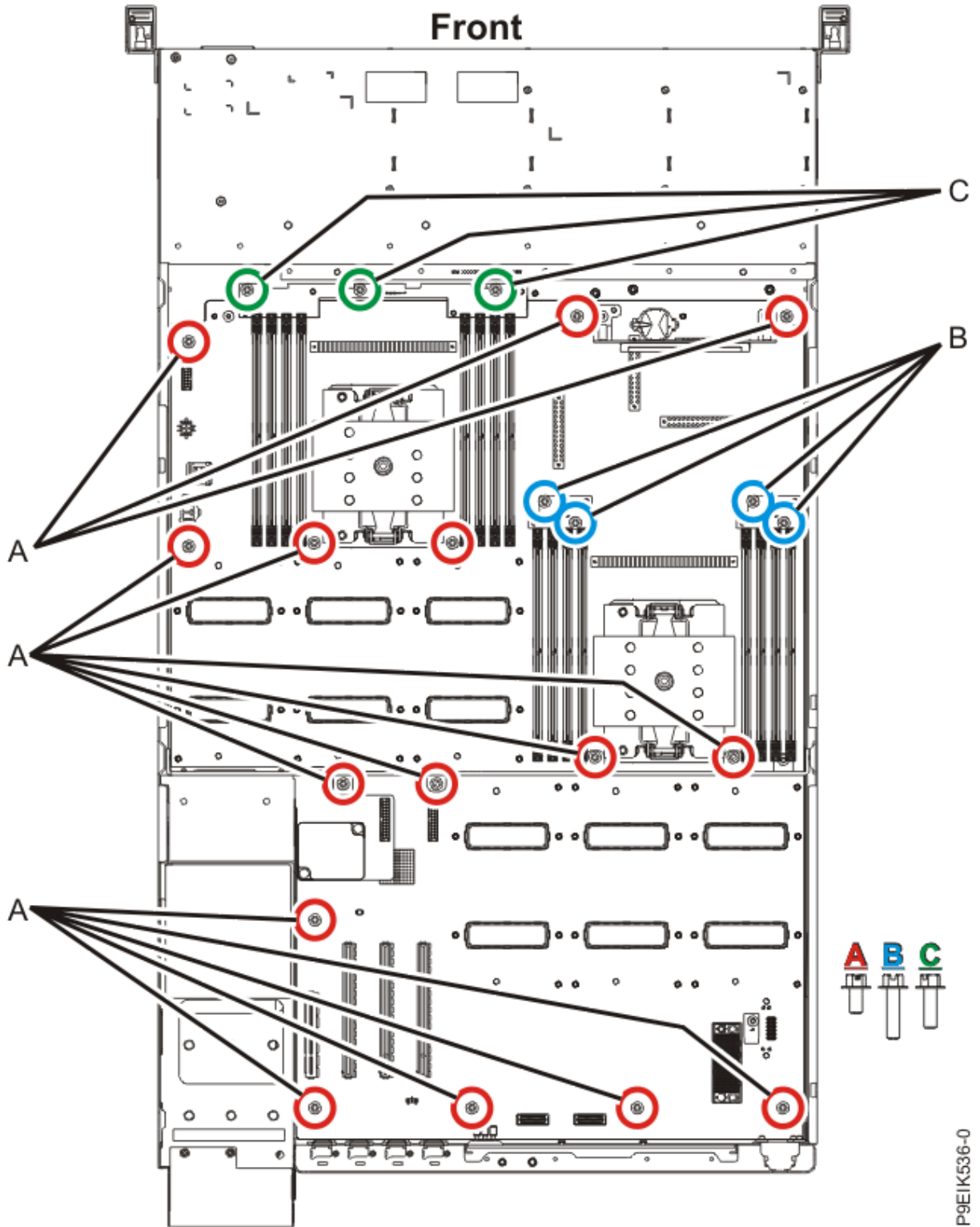
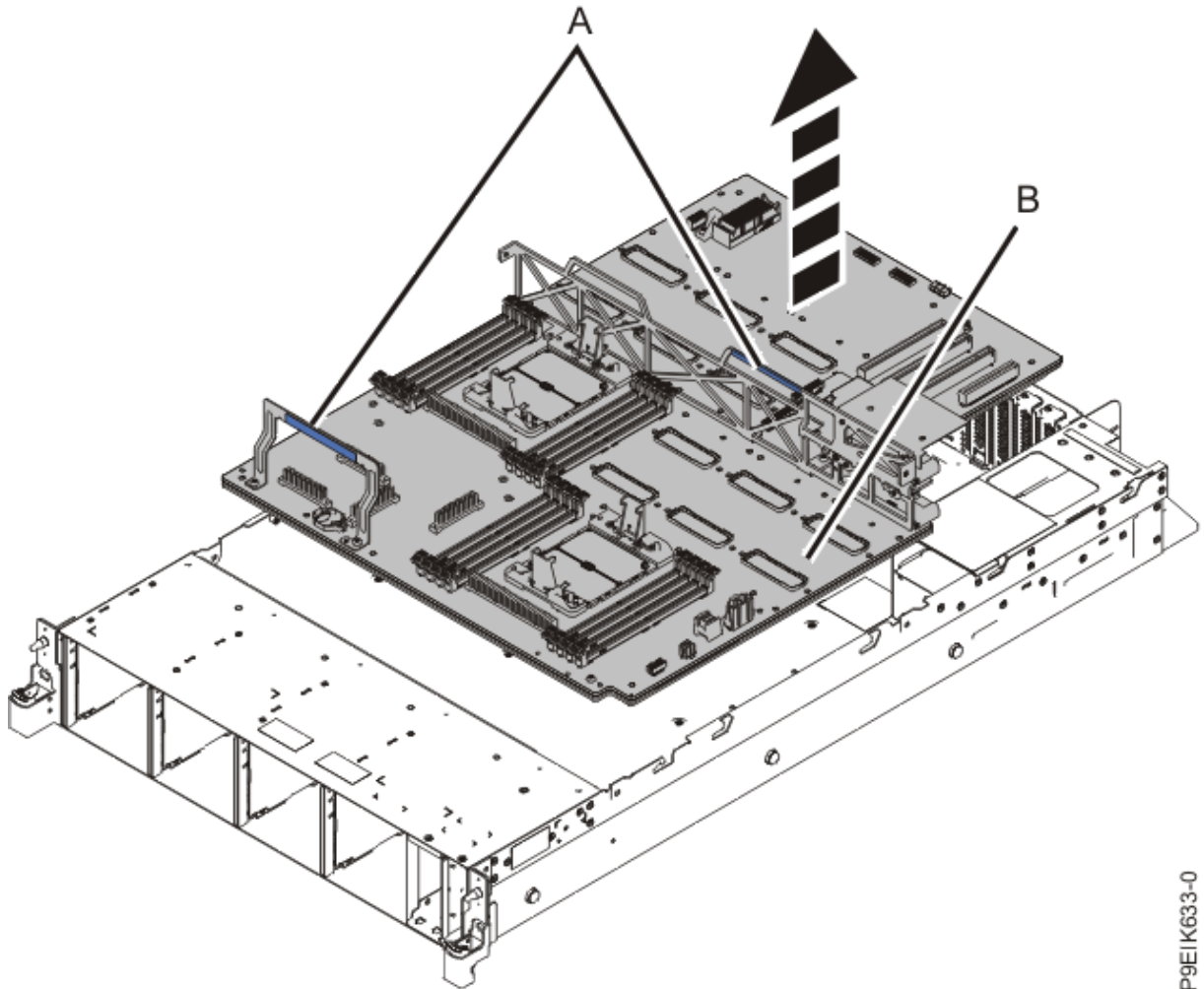


Figure 122. System backplane screw locations

16. Using the two blue handles **(A)**, lift the system backplane **(B)** straight up to remove it. See [Figure 123](#) on page 137.



P9EIK633-0

Figure 123. Lifting out the system backplane

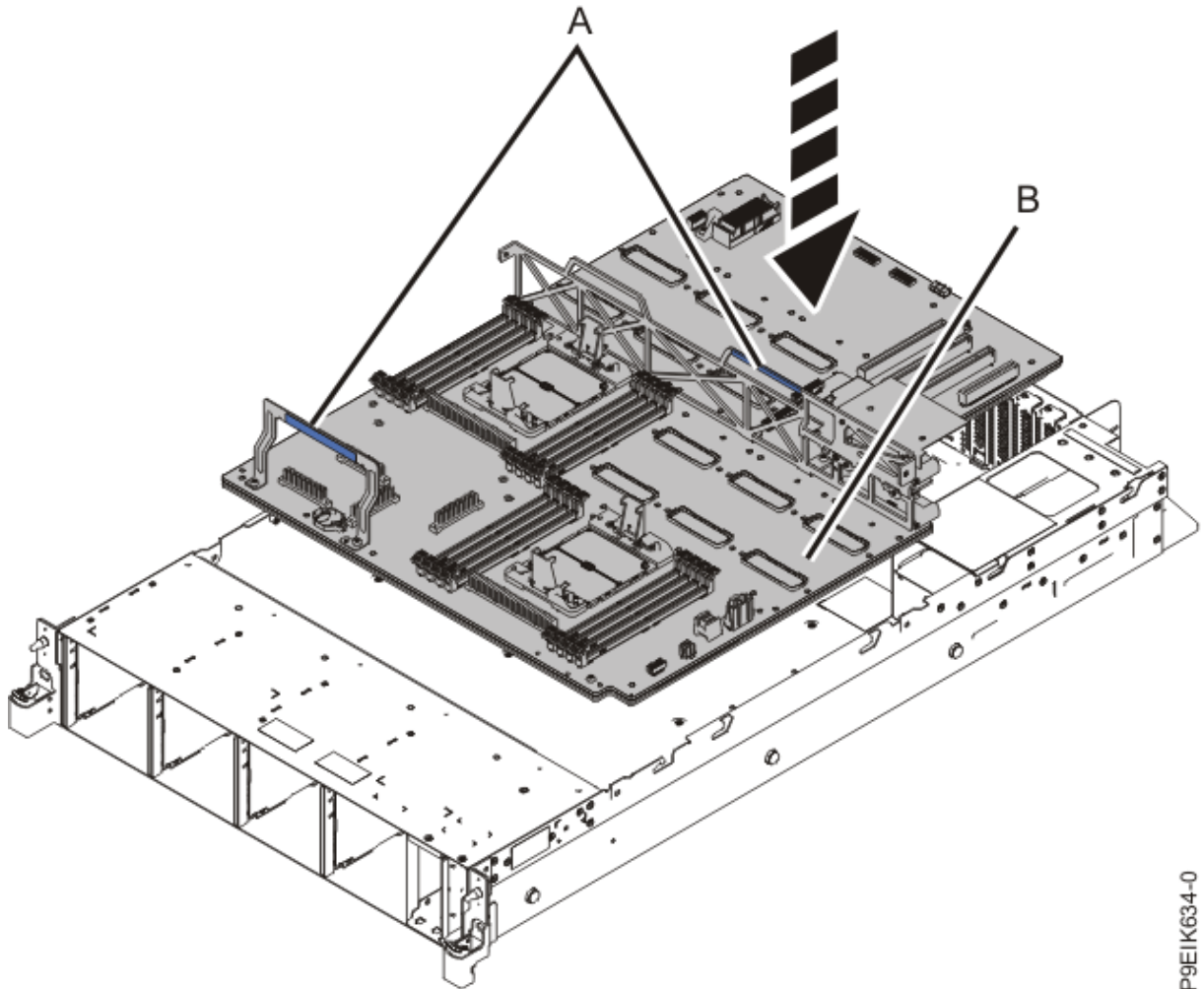
17. Place the system backplane on the ESD mat.

Replacing the system backplane in the 8335-GTX system

To replace a system backplane, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Remove the replacement system backplane from the static-protective package and place it on an ESD mat.
3. Using the blue handles **(A)**, lower the system backplane **(B)** into the system.



P9EIK634-0

Figure 124. Lowering the system backplane into the system

4. Replace the three metal pipe supports at **(B)** (two smaller supports) and **(C)** (one longer support). Align and tighten the 22 screws into the system backplane at **(A)** and into the pipe supports at **(B)** and **(C)**.

The screw locations are shown in [Figure 125 on page 139](#). The screws at **(A)** are the shortest. The screws at **(B)** and **(C)** are longer and secure the pipe supports.

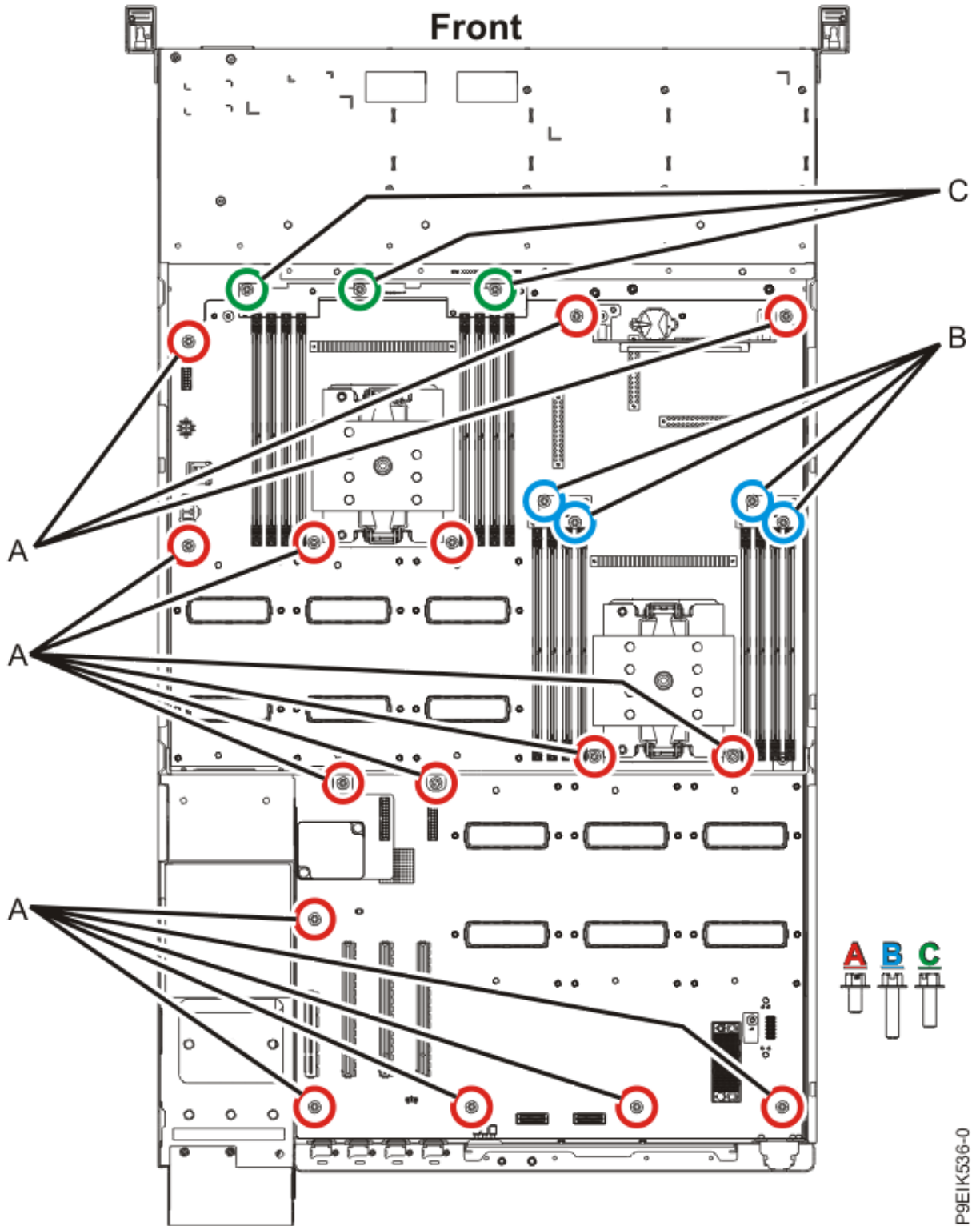
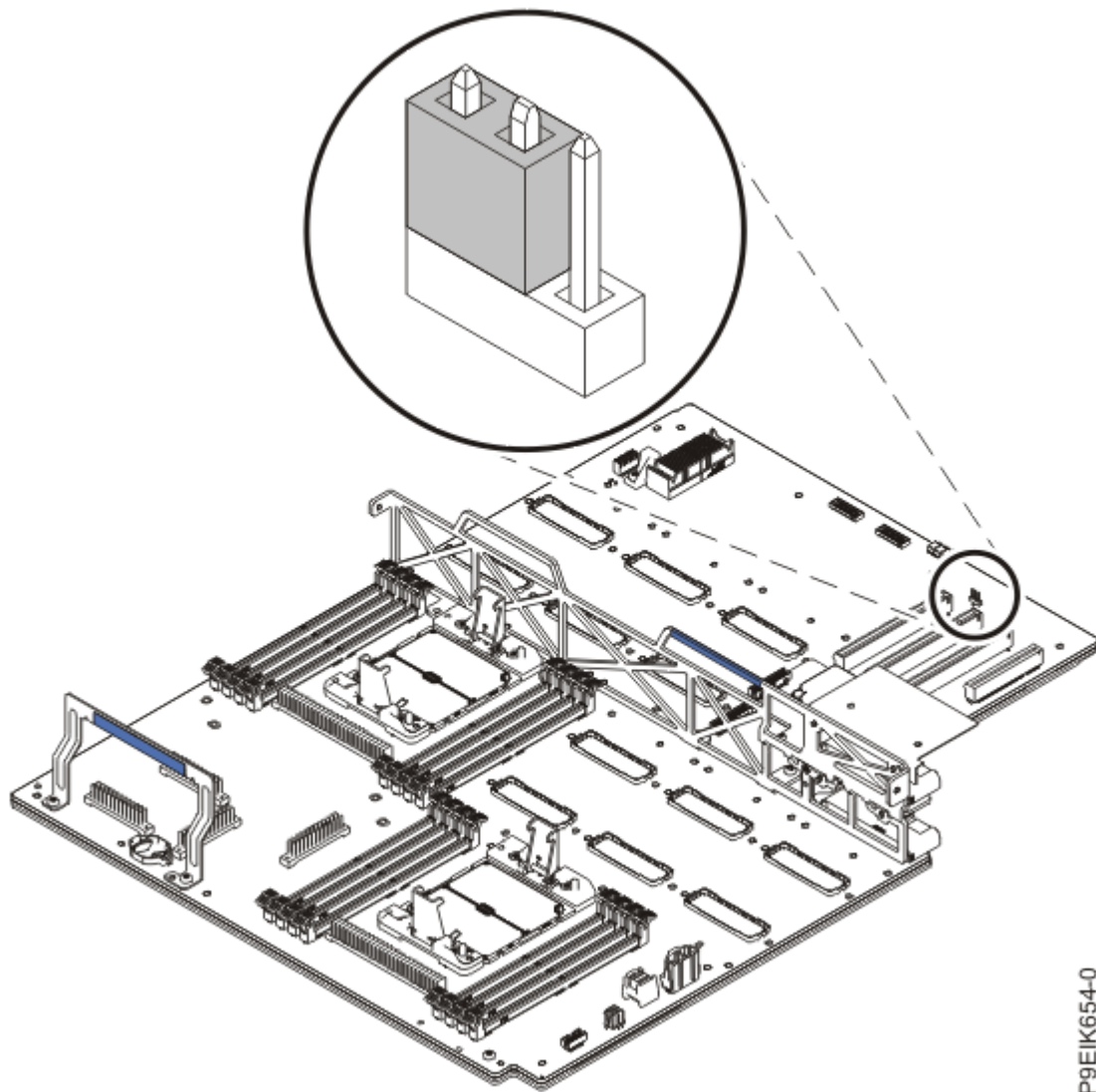


Figure 125. System backplane screw locations

5. Ensure that the jumper shown in Figure 126 on page 140 is set to the water cooled position.

P9EIK536-0



P9EIK654-0

Figure 126. Jumper in water-cooled position

6. Check the system processor backplane jumper locations.

Ensure that system backplane has no jumpers in locations **(A)** and **(B)** as shown in [Figure 127 on page 141](#). If there are jumpers in locations **(A)** and **(B)**, remove those jumpers.

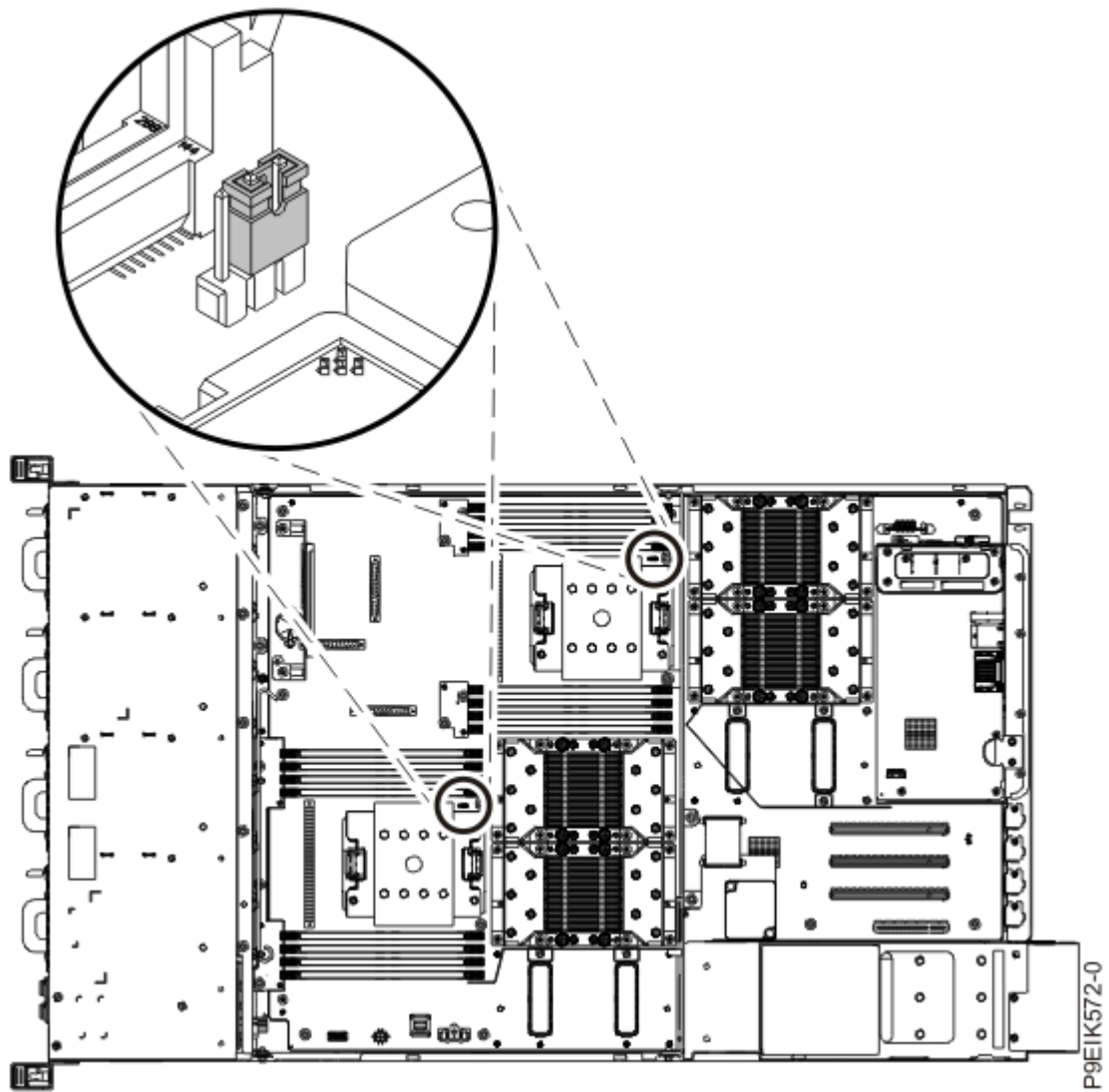
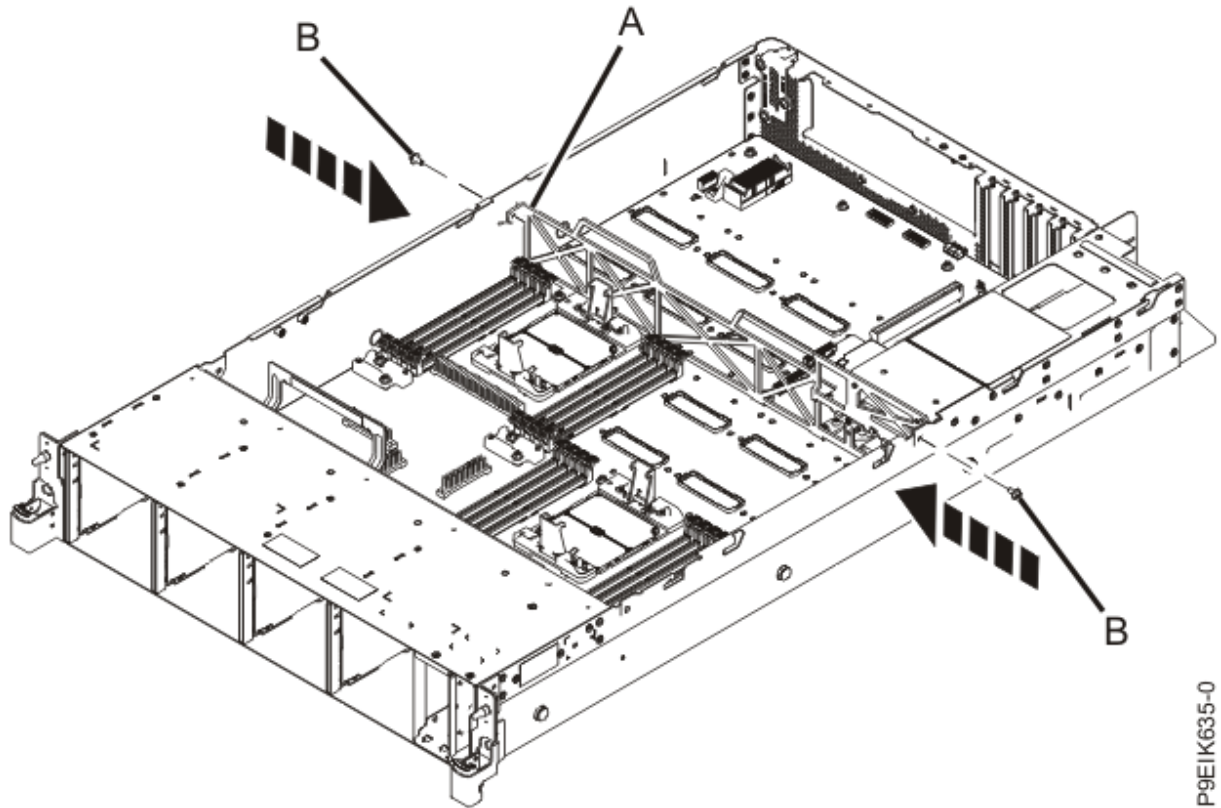


Figure 127. System processor jumper positions

7. Replace one screw **(B)** on each side of the middle support **(A)**.
See [Figure 128](#) on page 142.



P9EIK635-0

Figure 128. Replacing the middle support screws

8. Transfer the GPUs from the old system backplane to the new system backplane. Ensure that you use new TIMs on each of the GPUs.

For instructions, see [“Replacing the graphics processing unit in a water-cooled 8335-GTW or 8335-GTX system”](#) on page 96.

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

10. Prepare the system processor module for installation:

- a) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 129](#) on page 143.

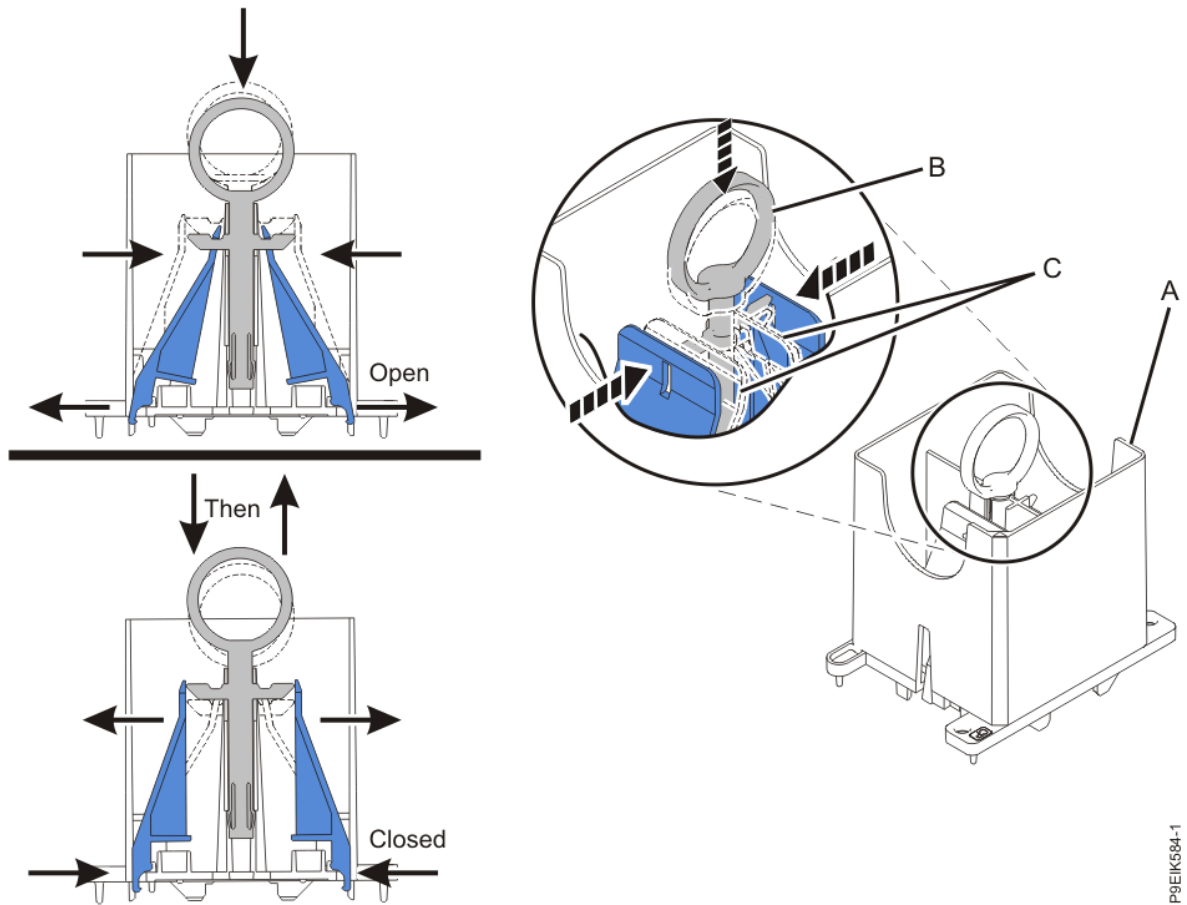
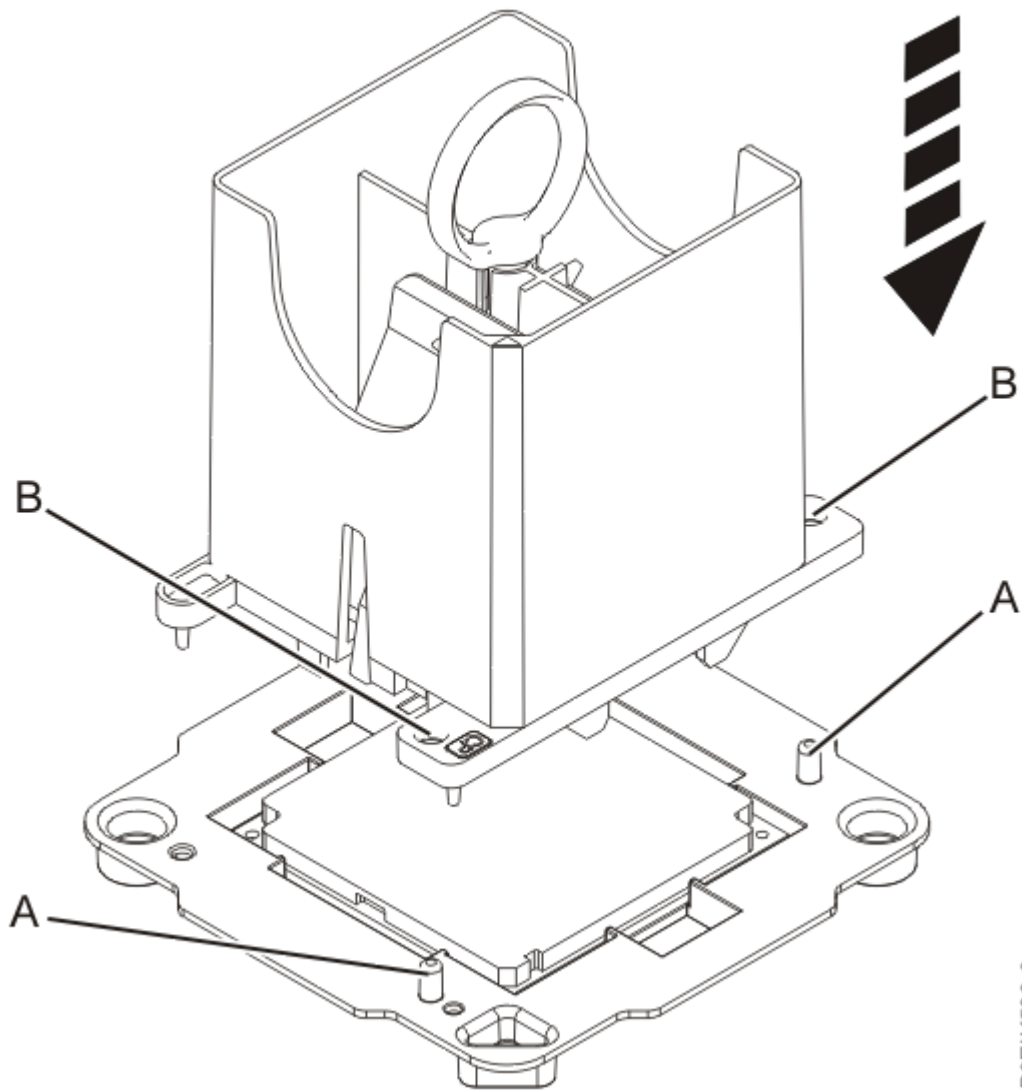


Figure 129. Opening the processor removal tool latches

- b) Lower the tool over the system processor module while ensuring that the two guide pins **(A)** insert into the alignment holes **(B)** on each side of the tool.

See [Figure 130](#) on page 144.



P9EIK586-0

Figure 130. Lowering the removal tool onto the system processor module

- c) With the removal tool sitting on top of the system processor module, push down on the ring **(A)** to close the latches **(C)** and lock the system processor module into the tool. Make sure that both of the tool jaws are locked on the system processor module.

See [Figure 131](#) on page 145.

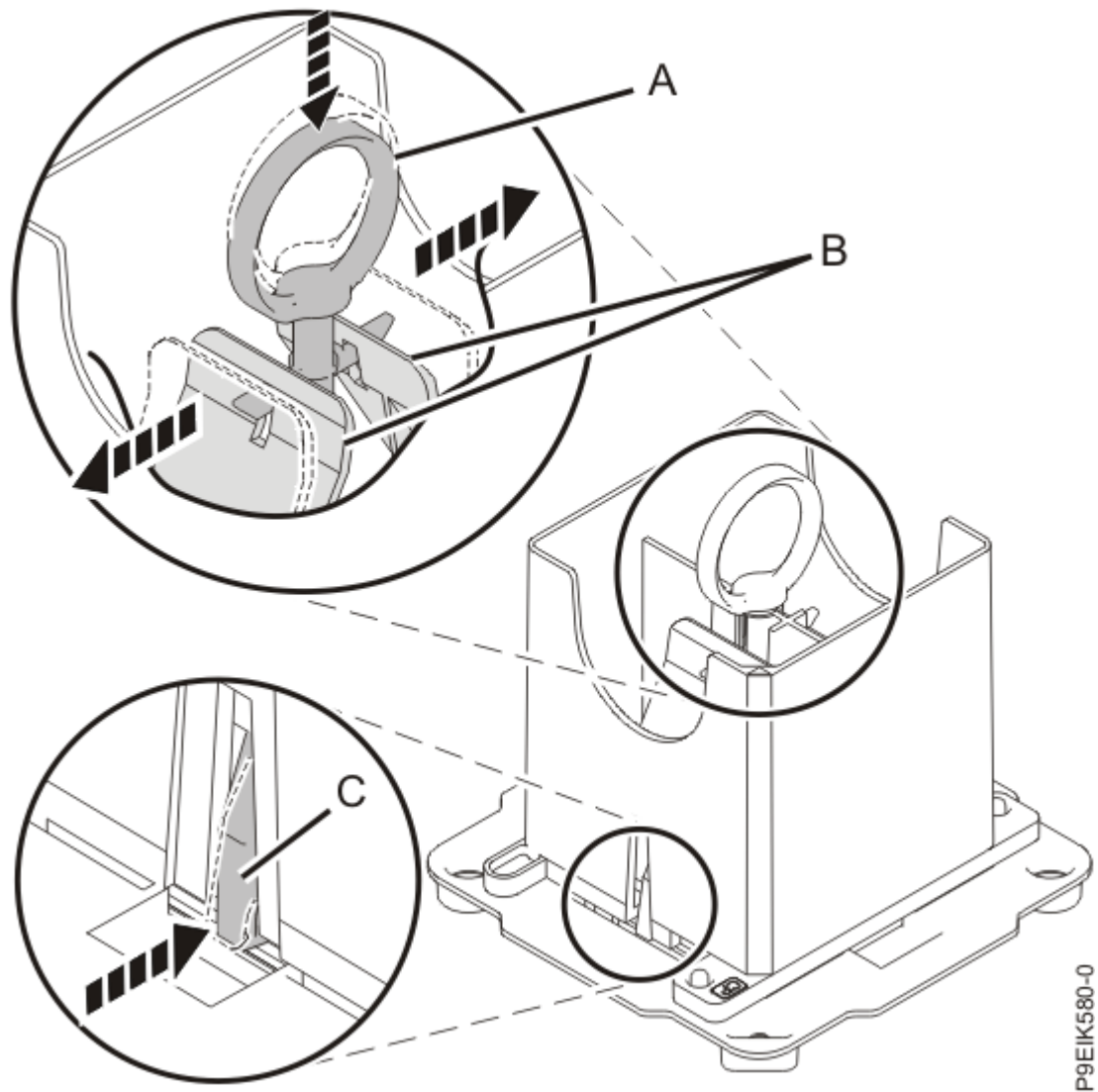
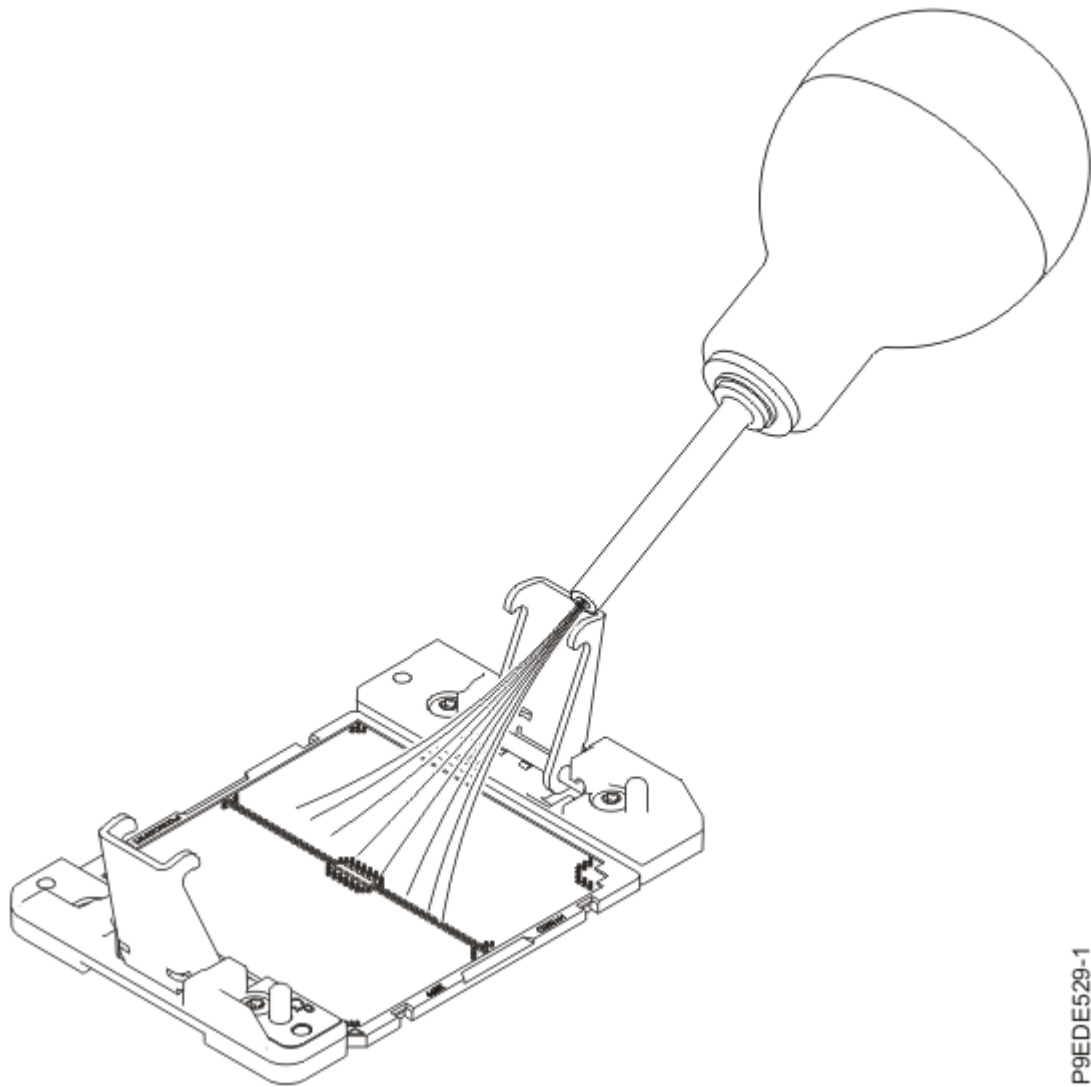


Figure 131. Locking the system processor module into the tool

11. Hold the sides of the tool with system processor module and carefully lift the tool out of the system processor module tray.
12. Install the system processor module:
 - a) If dust or debris is present on the system processor socket, use the supplied air pump to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown in [Figure 132](#) on page 146.



P9EDE529-1

Figure 132. Removing dust and debris from the system processor socket

- b) Lower the tool and system processor module onto the socket. Align the guide pins **(A)** with the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool.

See [Figure 133](#) on page 147.

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.

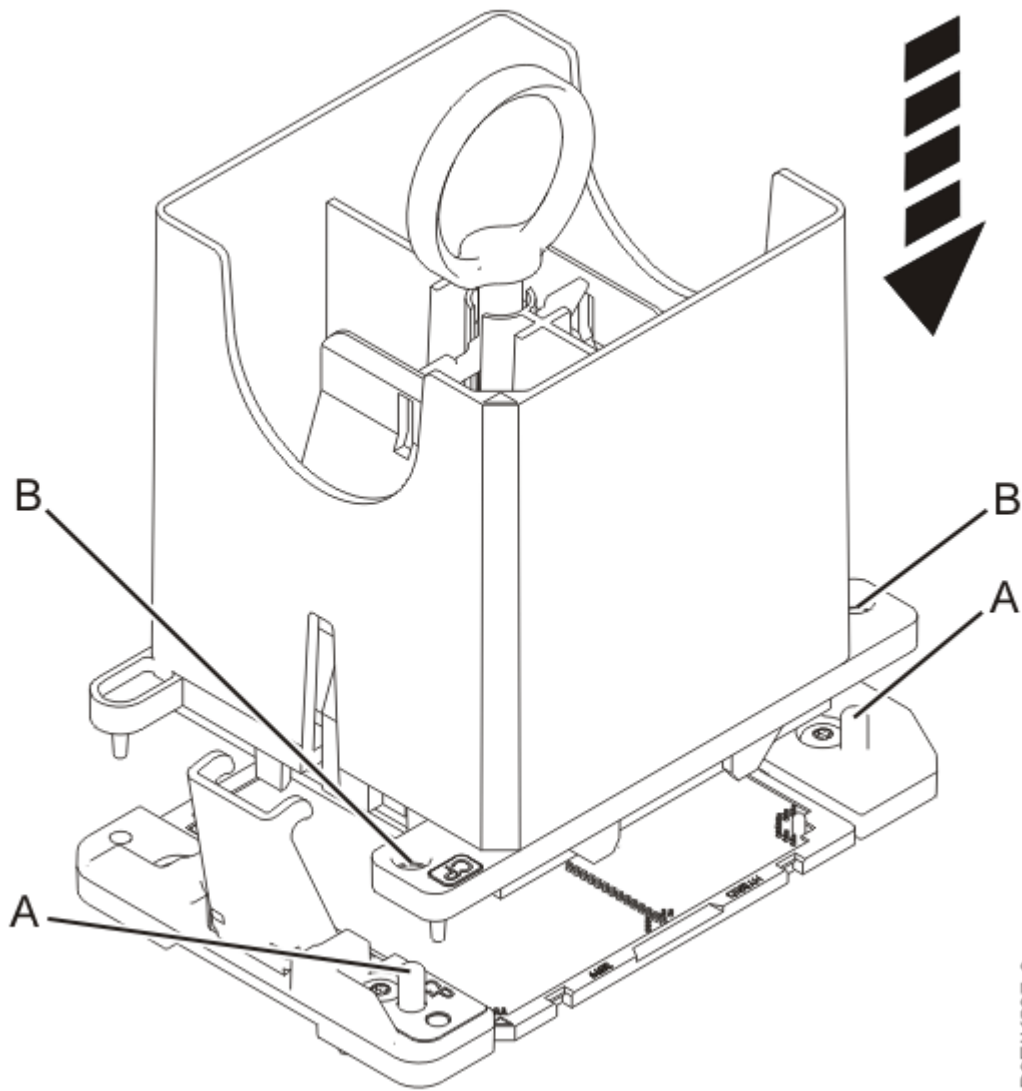
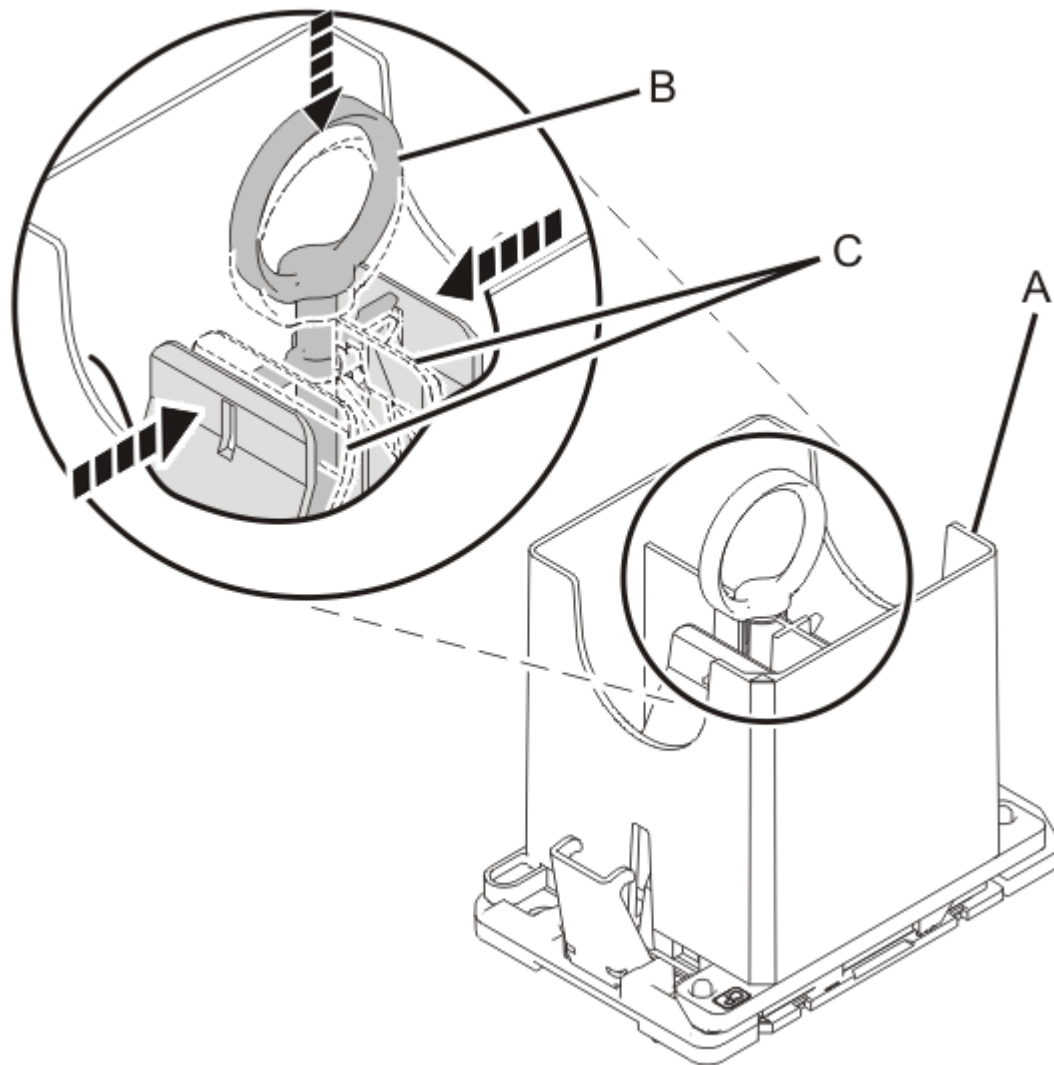


Figure 133. Installing the system processor module

- c) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 134](#) on page 148.



P9EIK582-0

Figure 134. Removing the system processor module tool

- d) Lift the tool off the system processor module.
- 13. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in [Figure 135](#) on [page 149](#). If you see folds, tears, bends, or if you have doubts about the TIM, replace it.

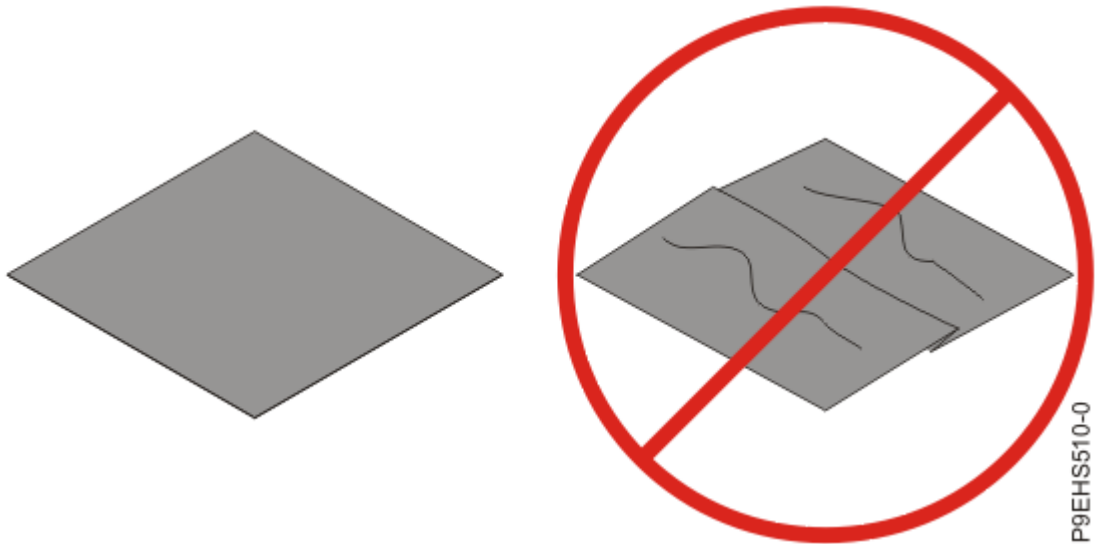


Figure 135. Inspecting the thermal interface material

14. Choose one of the following repair options:

Option	Description
Is the TIM damaged?	It is damaged. Proceed to step “15” on page 149 to replace the TIM and install the cold plate.
Is the TIM OK?	It is not damaged and can be reused. Proceed to step “16” on page 150 to move the TIM and install the cold plate.

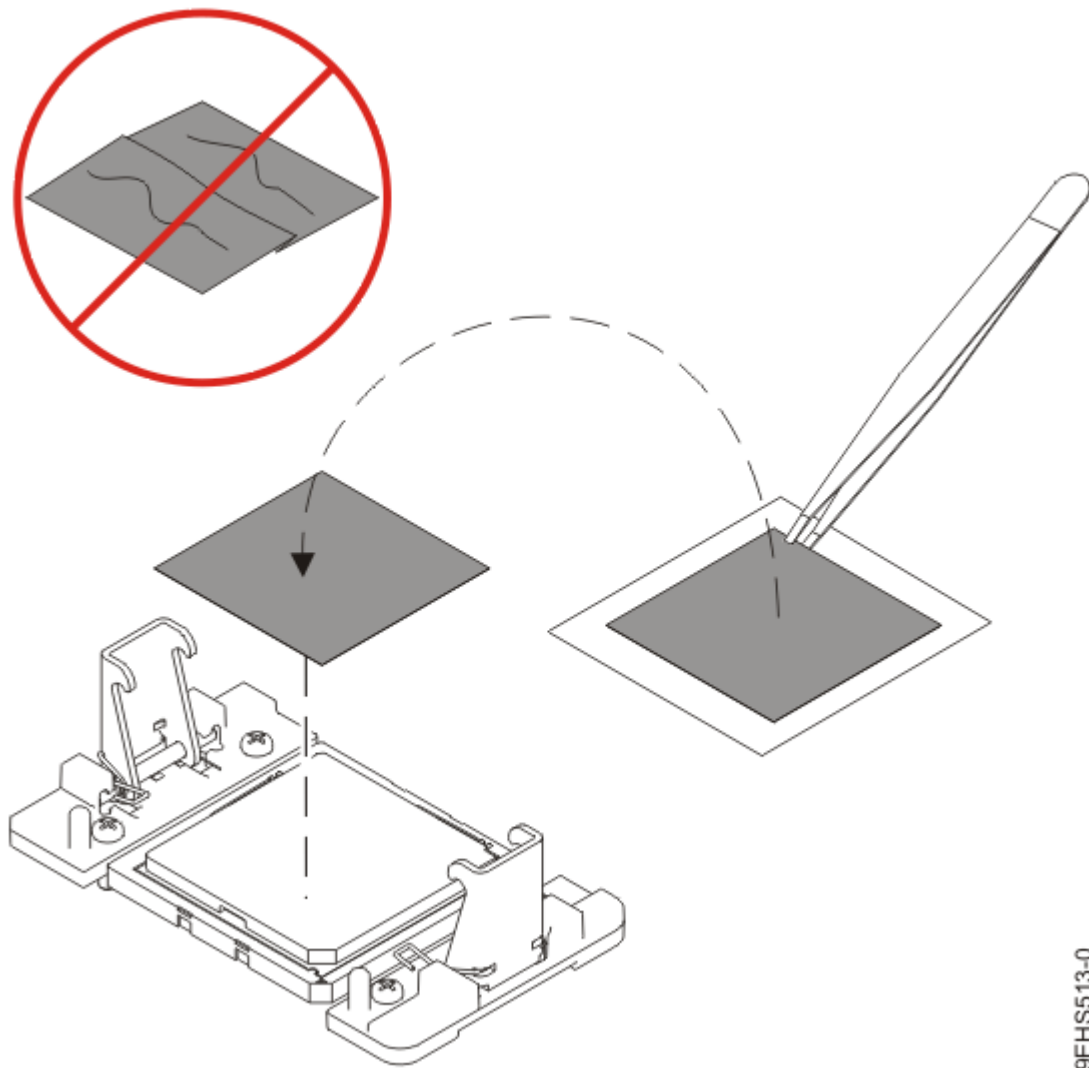
15. Use this step to install a new TIM and reuse the existing heat sink.

- 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 TIM has no preferred up side. The TIM can be placed on the system processor module and centered as shown in [Figure 136 on page 150](#).



P9EHS513-0

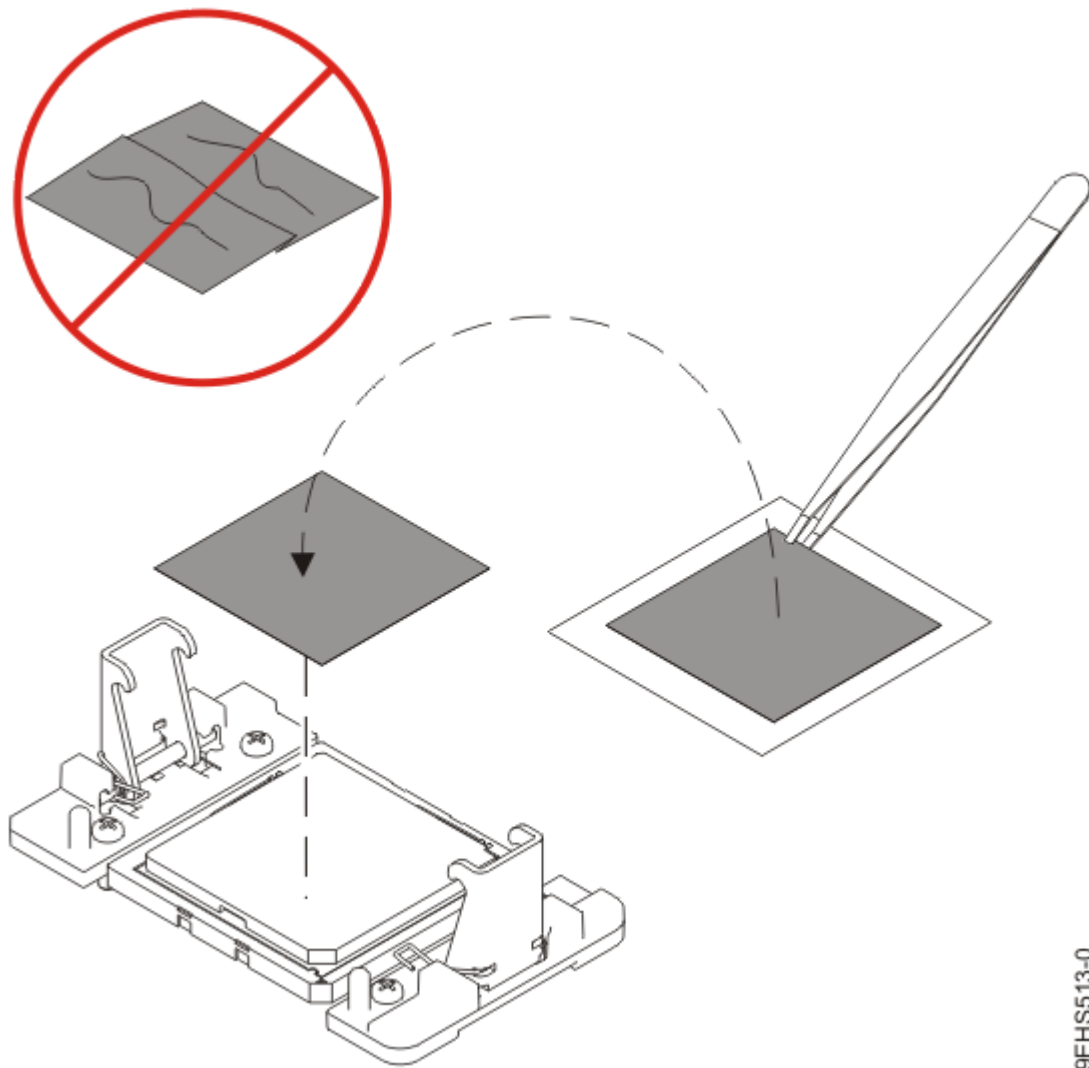
Figure 136. Installing a new TIM onto the system processor module

Continue with step “17” on page 151.

16. Use this step to reuse the existing undamaged TIM and heat sink.

- a) Using the tweezers, move the old TIM from the clean, dry surface and center it onto the new system processor module.

The TIM has no preferred up side. The TIM can be placed on the system processor module and centered as shown in [Figure 137 on page 151](#).



P9EHS513-0

Figure 137. Replacing the TIM onto the system processor module

17. Replace the cold plates.

For instructions, see [“Replacing the cold plates in the 8335-GTW or 8335-GTX system”](#) on page 45.

18. Using your labels, replace the power switch and cable and the USB cable and connector into those connectors in the system backplane.

For instructions, see [“Replacing the power switch and cable in the 8335-GTX system”](#) on page 121.

19. Using your labels, replace the fan power cable into that connector in the power distribution card.

For instructions, see [“Replacing the fan power cable in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 90.

20. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 83.

21. Using your labels, replace the PCIe adapters.

For instructions, see [“Replacing a PCIe adapter in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 109.

22. Replace the BMC card.

For instructions, see [“Replacing the BMC card in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 4.

23. Transfer the memory modules from the old system backplane to the new system backplane.

For instructions, see “Removing and replacing memory modules in the 8335-GTW or 8335-GTX system” on page 102.

24. Transfer the time-of-day battery from the old system backplane to the new system backplane.

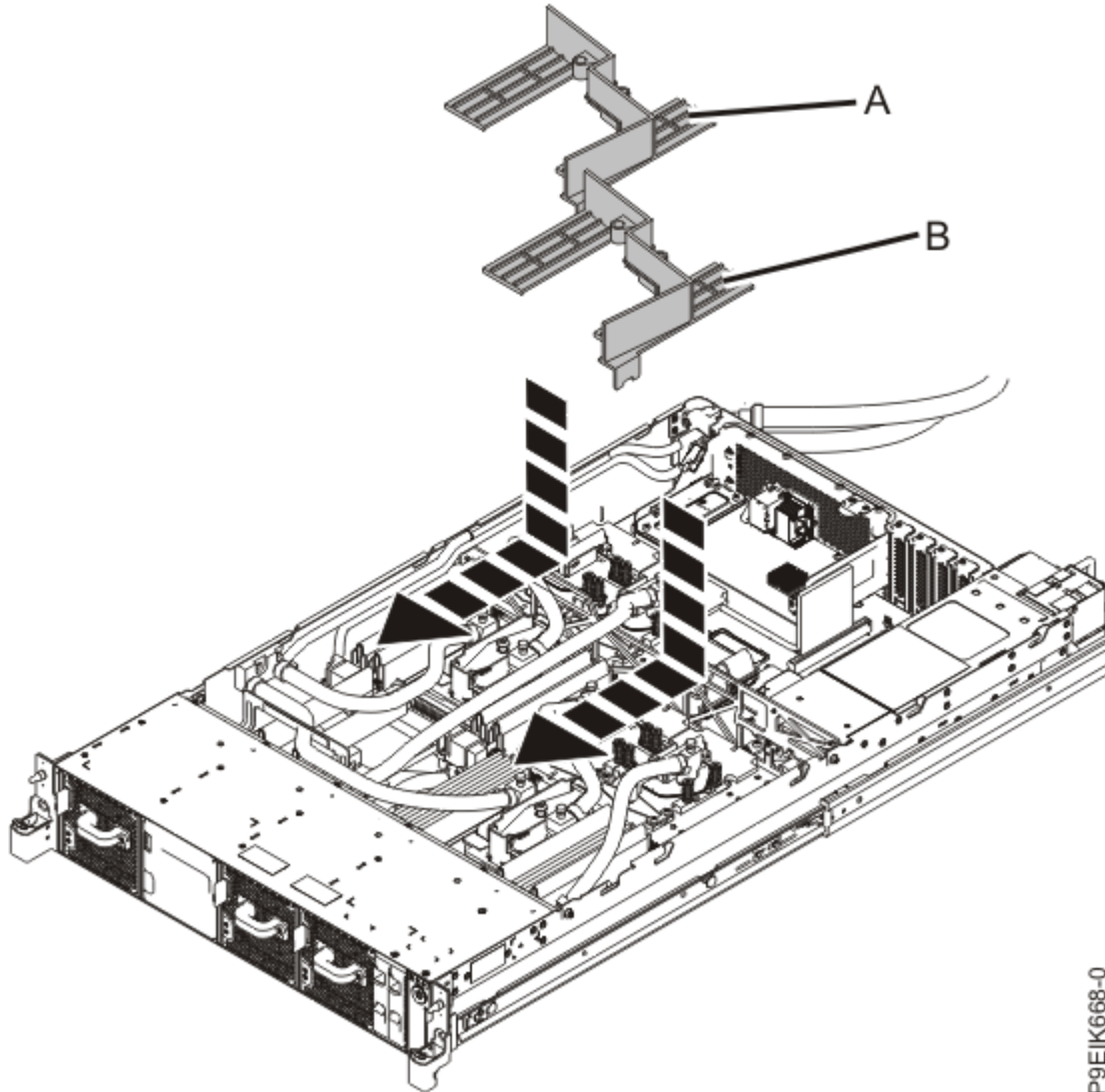
For instructions, see “Removing and replacing the time-of-day battery in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 177.

25. Transfer the trusted platform module from the old system backplane to the new system backplane for the 8335-GTH system.

For instructions, see “Removing and replacing the trusted platform module in the 8335-GTH or 8335-GTX system” on page 179.

26. Replace the air baffles **(A)** and **(B)** as shown in [Figure 138](#) on page 152.

Carefully move the baffles around the hoses.



P9EIK668-0

Figure 138. Replacing the memory air baffles

Preparing the system for operation after removing and replacing the system backplane in the 8335-GTX

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

Procedure

1. Prepare the system for operation.

For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts”](#) on page 220.

2. Verify that the jumper is set to the water-cooled position by using the following command. The system must be powered on.

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> fru print | grep -i watercooled
```

The value for the water cooled setting is 1:

```
"WaterCooled": 1
```

If the value returned is not 1, you must correct the jumper setting. See [“Replacing the system backplane in the 8335-GTX system”](#) on page 137.

3. Ensure that the vital product data (VPD) update tool is installed.

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](http://www.ibm.com/mysupport/s/) website (<http://www.ibm.com/mysupport/s/>).
- b. In the search field, type Scale-out LC System Event Log Collection Tool.
- c. Click the **Scale-out LC System Event Log Collection Tool** entry and follow the directions that are provided with the tool to update the VPD.

4. Set the system serial number and model number in the system backplane by completing the following steps.

These commands require root access and must be run from the host operating system, after the VPD update tool is installed.

- a) Update the machine serial number by running the following command, replacing *1234567* with your seven character serial number:

The command must be run after the system is powered on.

```
/opt/openpower/lht/bin/updateserial 1234567
```

- b) Update the machine model by running the following command:

```
/opt/openpower/lht/bin/updatemodel 8335-GTW
```

- c) Ensure that those changes take effect by stopping and then starting the system.

See:

- i) [“Stopping the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 223
- ii) [“Starting the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system ”](#) on page 222

Removing and replacing a system processor module in the 8335-GTW or 8335-GTX system

Learn how to remove and replace a system processor module or how to upgrade all of the system processor modules in the IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Removing a system processor module from the 8335-GTW or 8335-GTX system

To remove a system processor module, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

About this task

As part of the system processor module replacement, the cold plate is removed. Each module must have thermal interface material (TIM) between the module and the cold plate. If the TIM is damaged, it must be replaced. Ensure that you have spare system processor TIMs available before proceeding.

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Open the packaging of the new system processor module, and place the cover upside down next to the tray, as shown in [Figure 139 on page 155](#). The cover is used for the system processor module that you are replacing.

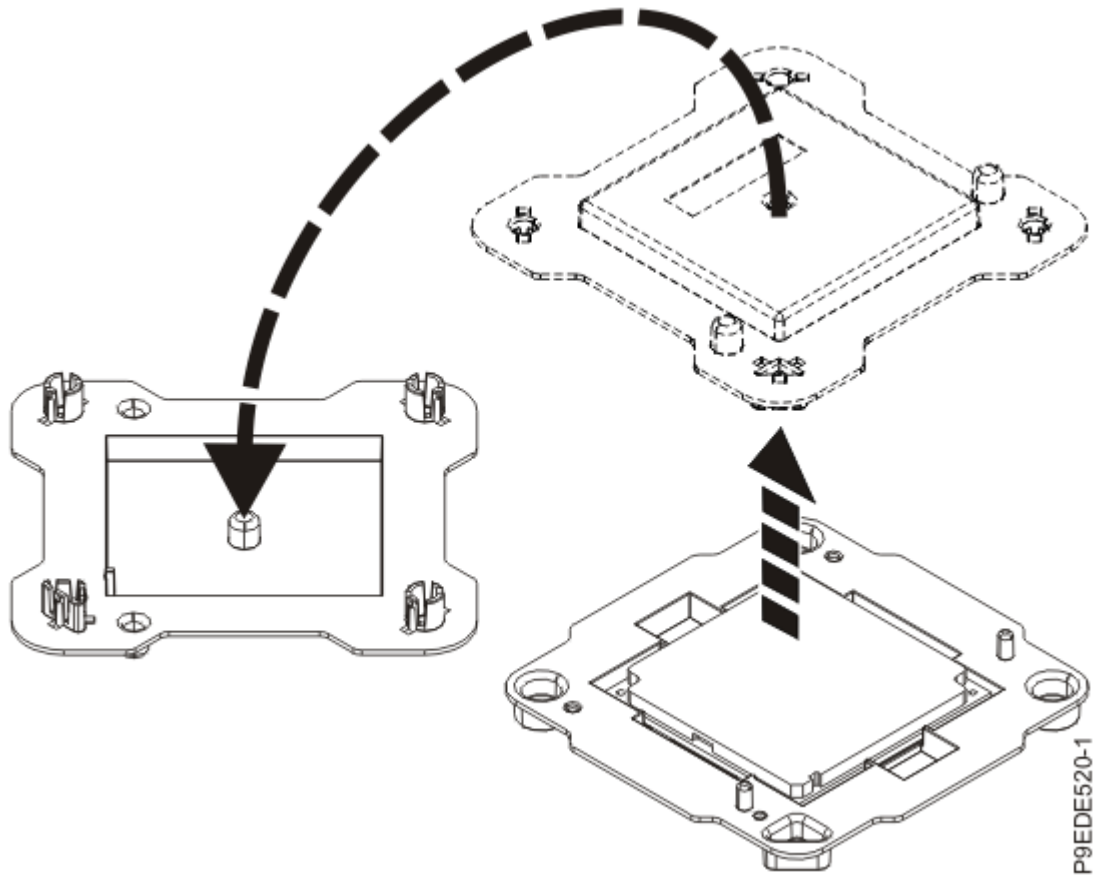
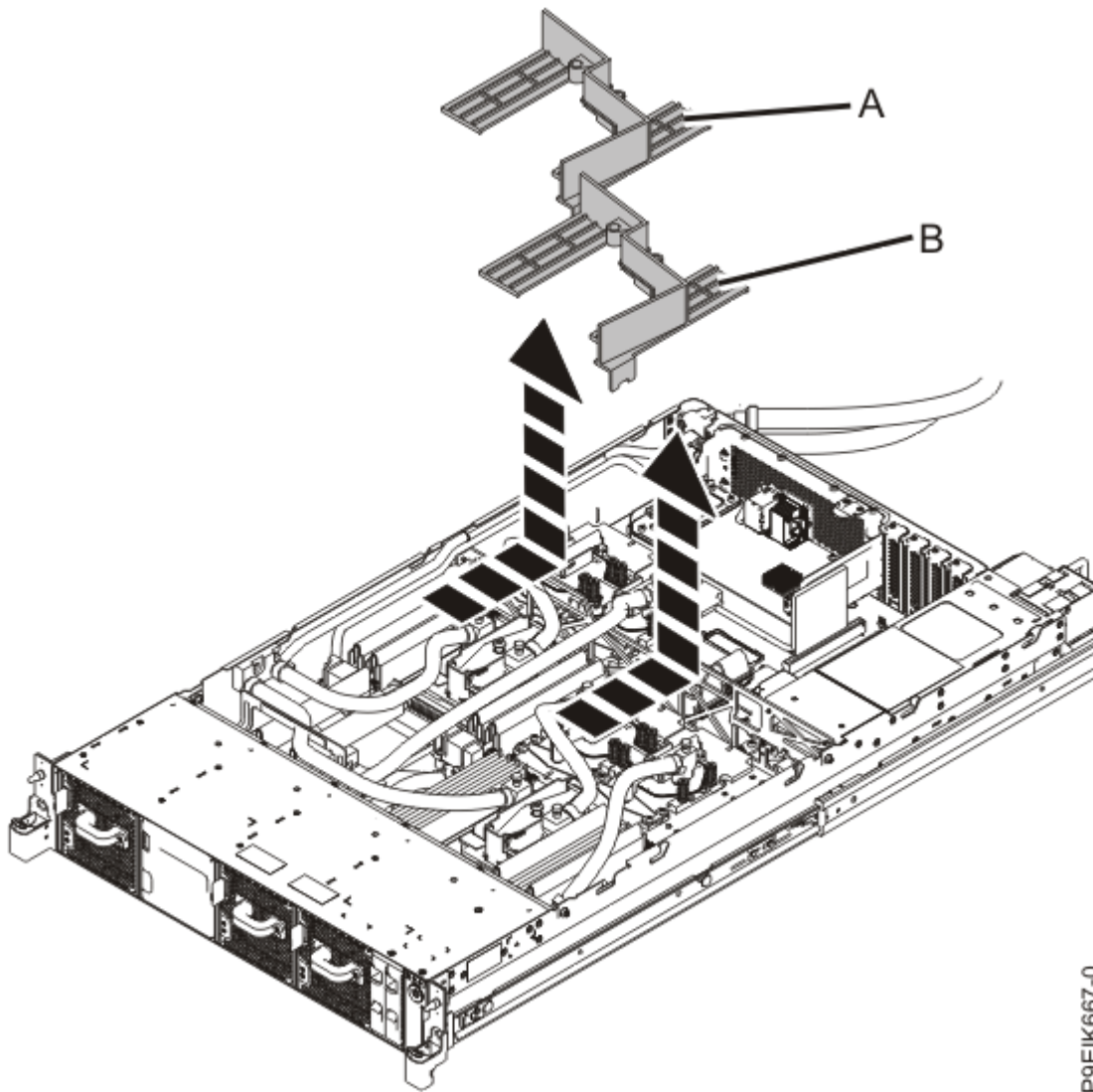


Figure 139. Opening the system processor module packaging

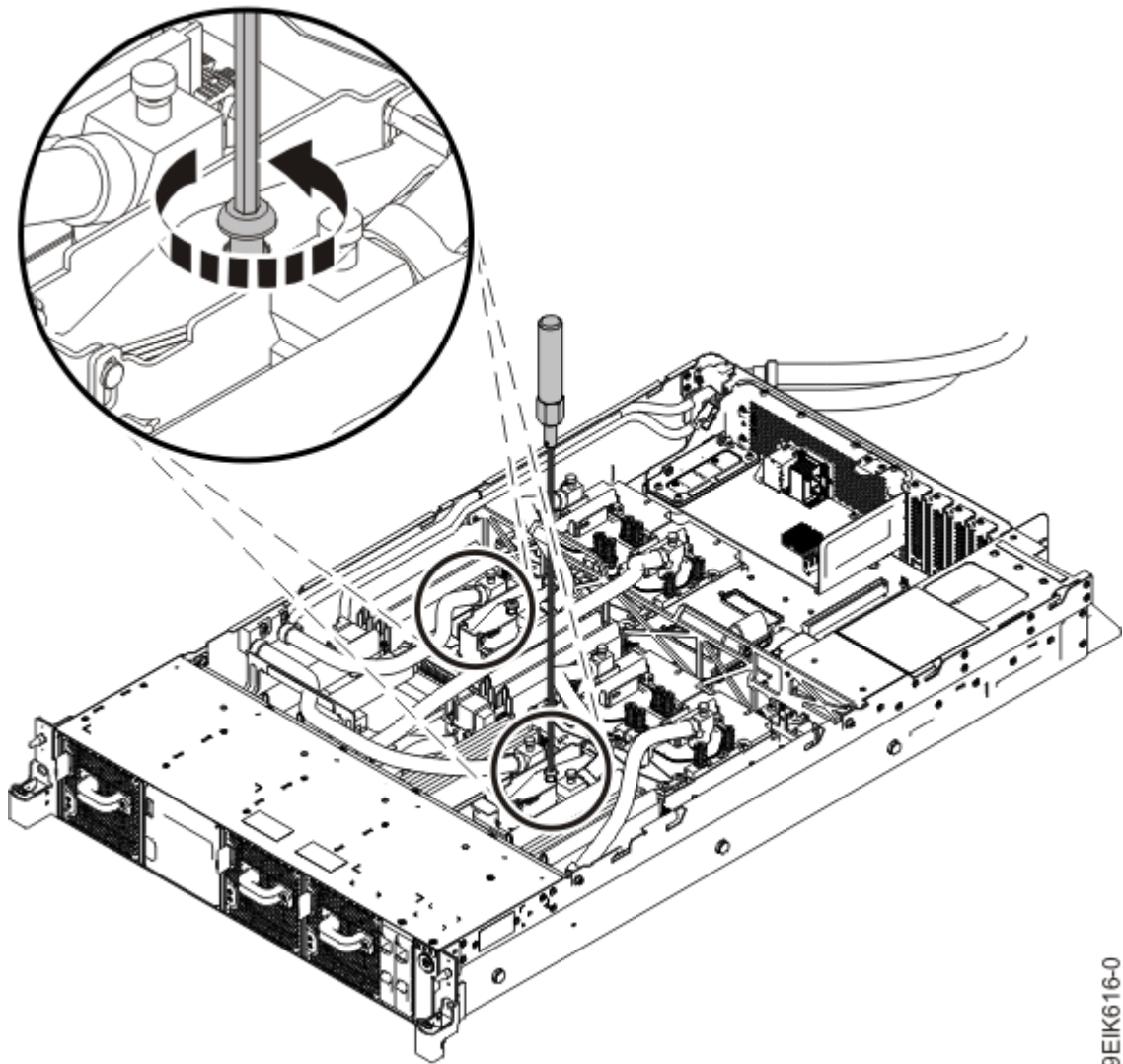
3. Remove the air baffles **(A)** and **(B)** as shown in [Figure 140](#) on page 156. Carefully move the baffles around the hoses.



P9EIK667-0

Figure 140. Removing the memory air baffles

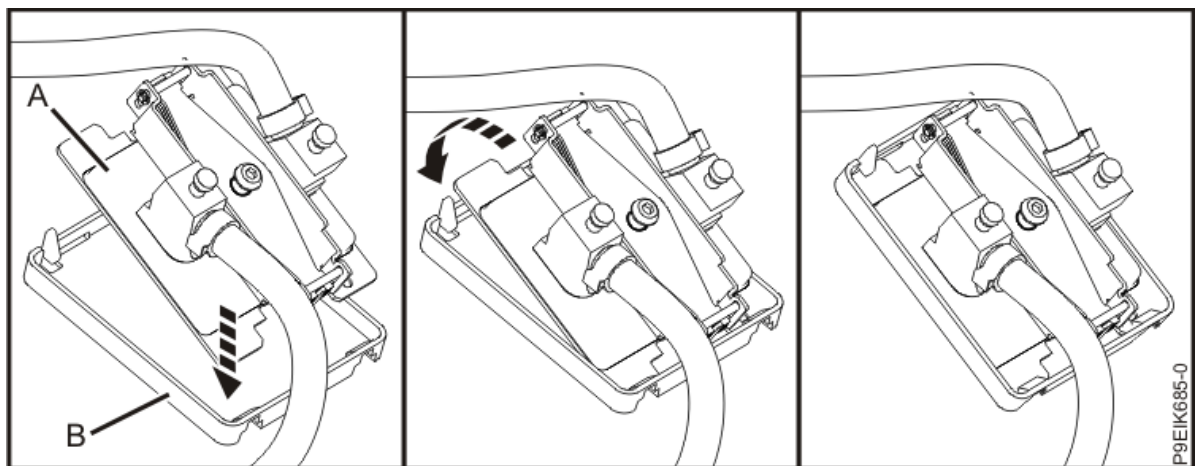
4. Remove the cold plate from the system processor module.
 - a) Apply light pressure downward on the cold plate. Loosen the retainer screw of the system processor module cold plate by turning the supplied hex key counterclockwise. Loosen the screw until it moves freely.
See [Figure 141](#) on page 157.



P9EIK616-0

Figure 141. Loosening the cold plate retainer screw

- b) Lift the cold plate **(A)** straight up off the system processor module and attach the protective cover **(B)** to the cold plate as shown in Figure 142 on page 157.

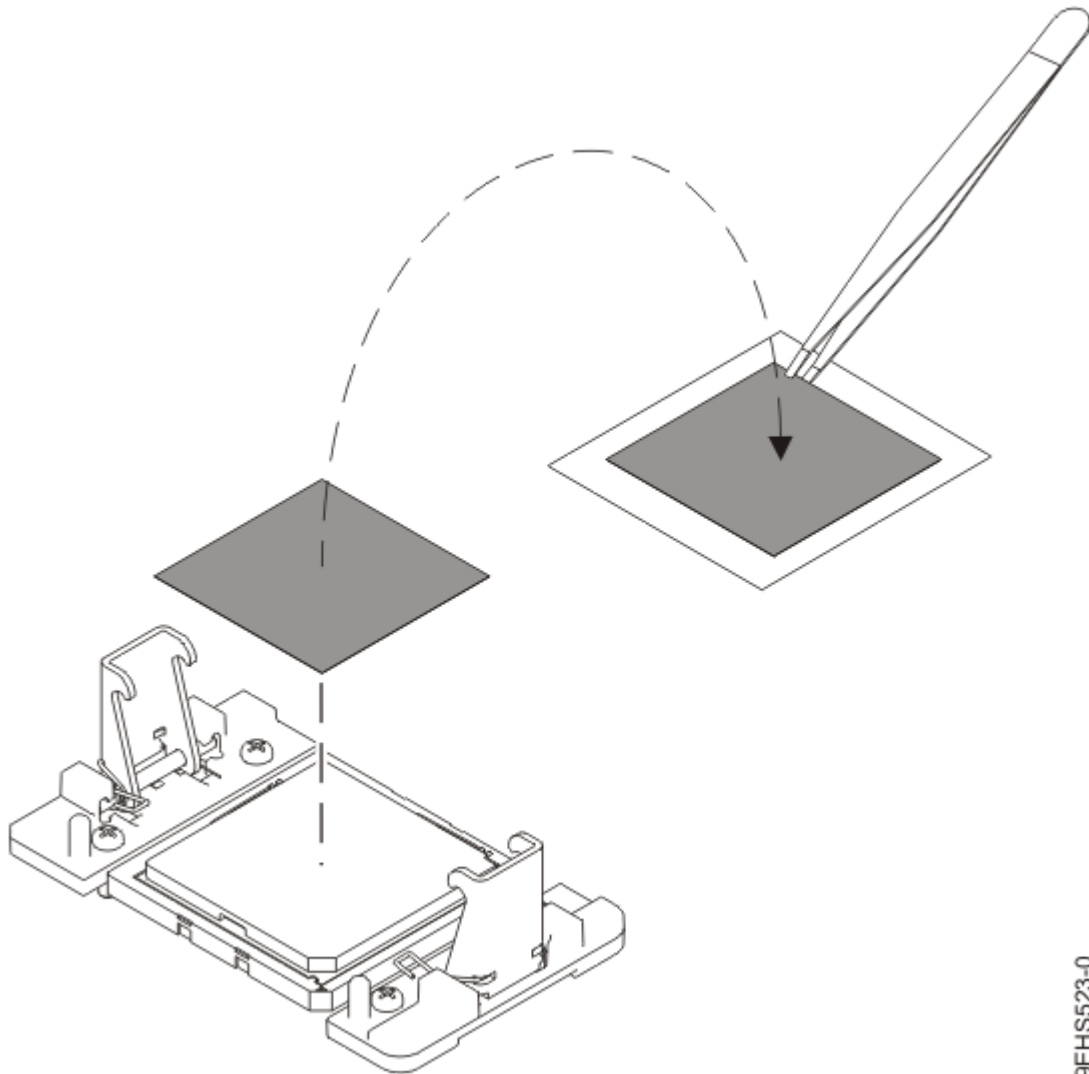


P9EIK685-0

Figure 142. Removing the cold plate and attaching the protective cover

- c) Move the cold plate and cover off to the side, away from the system processor module.

- Using tweezers, carefully remove the TIM from the top of the system processor module and place it in a clean, dry area as shown in [Figure 143](#) on page 158.
The TIM can tear easily.



P9EHS523-0

Figure 143. Removing the TIM from the system processor module

- Remove dust and debris from the system processor module area.

If dust or debris is present, use the supplied air pump 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 144](#) on page 159. If your air pump is not assembled as shown in [Figure 144](#) on page 159, fasten the tip onto the bulb.

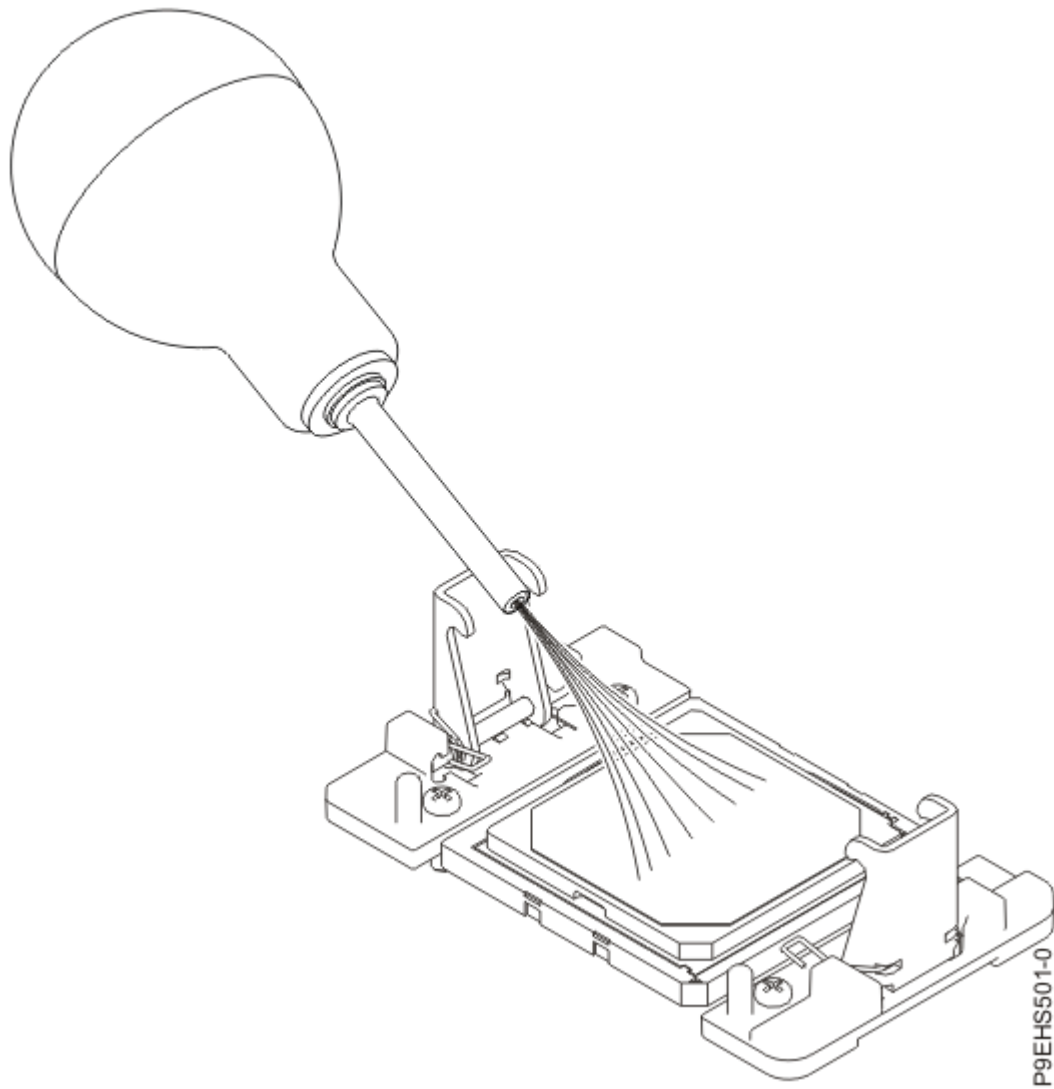


Figure 144. Removing dust and debris from the system processor module area

7. Prepare the system processor module for removal.

- a) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 145](#) on page 160.

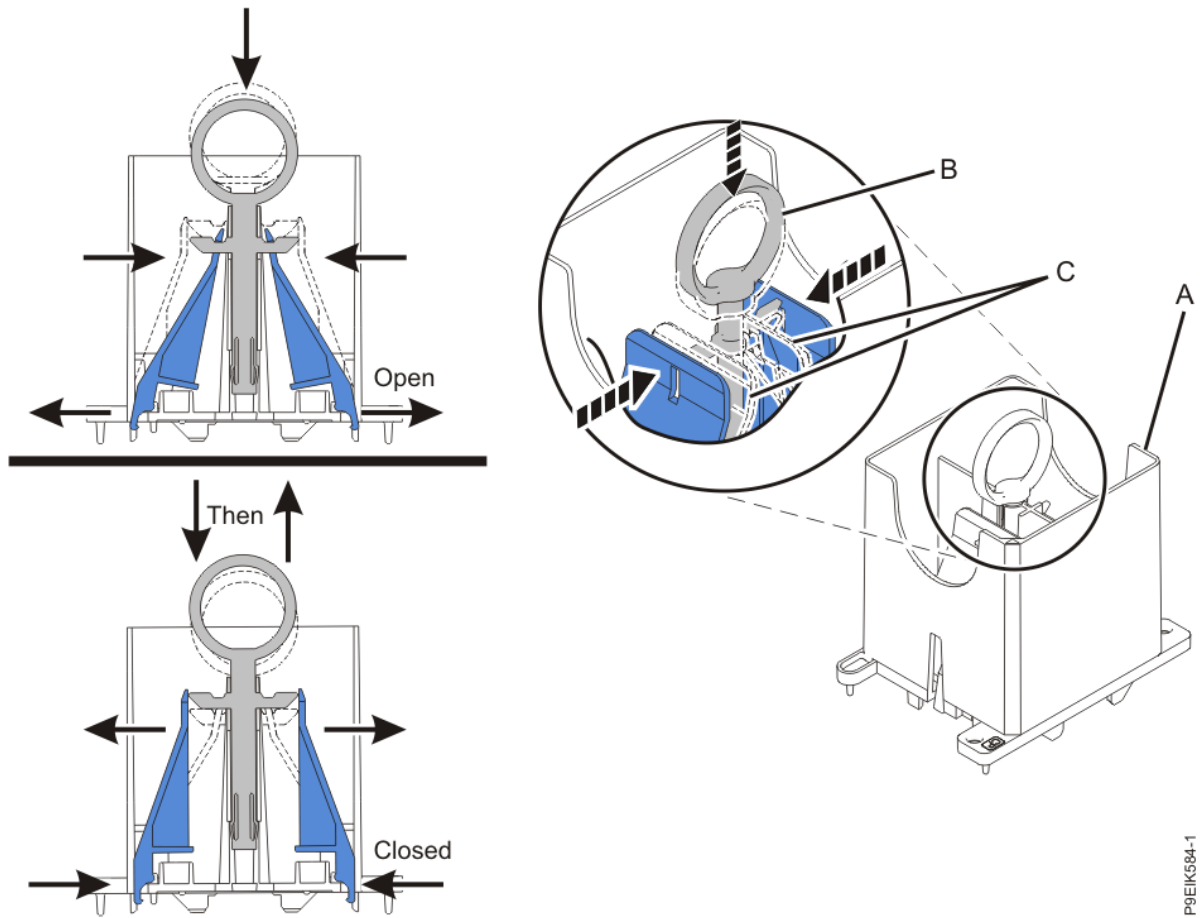
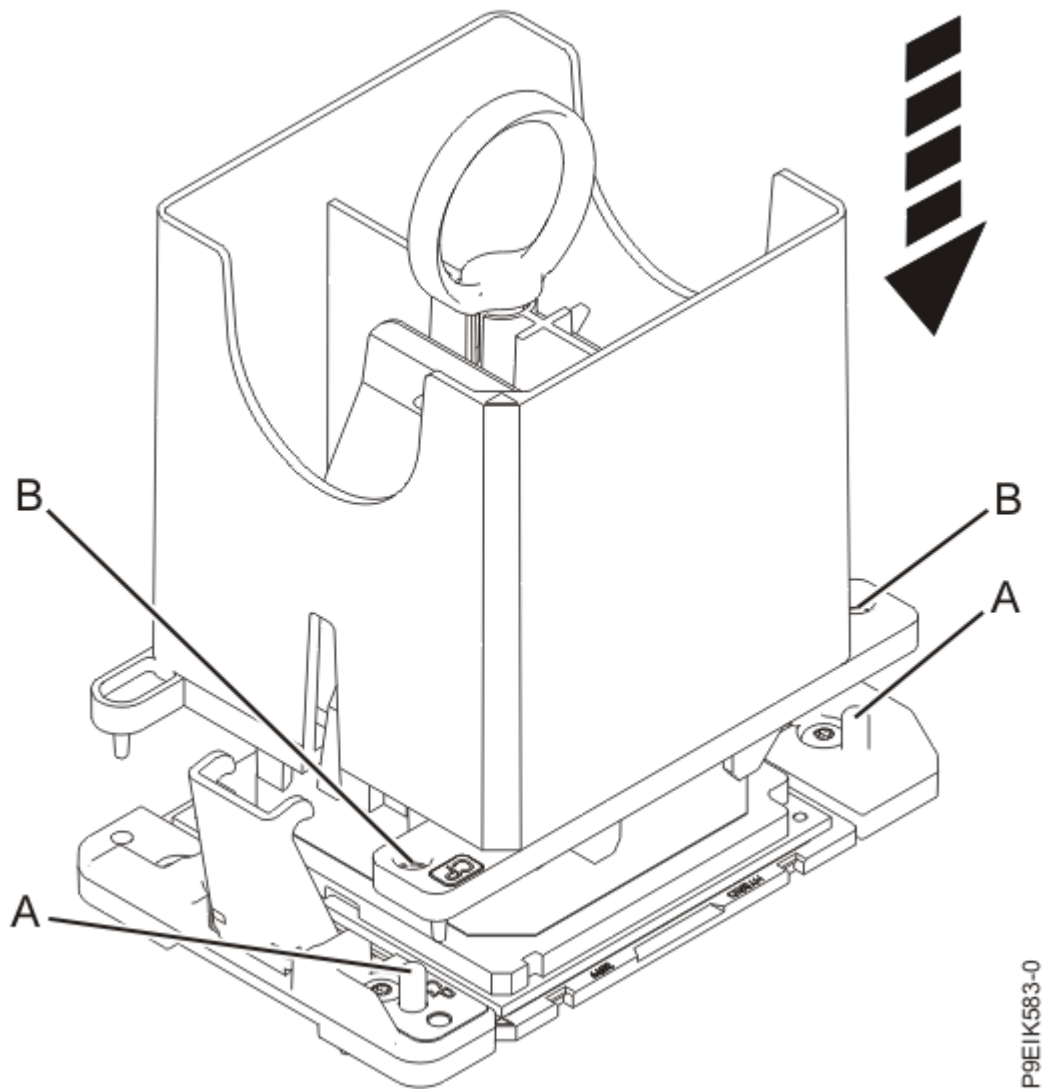


Figure 145. Opening the processor removal tool latches

- b) Lower the tool over the system processor module while ensuring that the two guide pins **(A)** insert into the alignment holes **(B)** on each side of the tool.

See [Figure 146](#) on page 161.

P9EIKS84-1

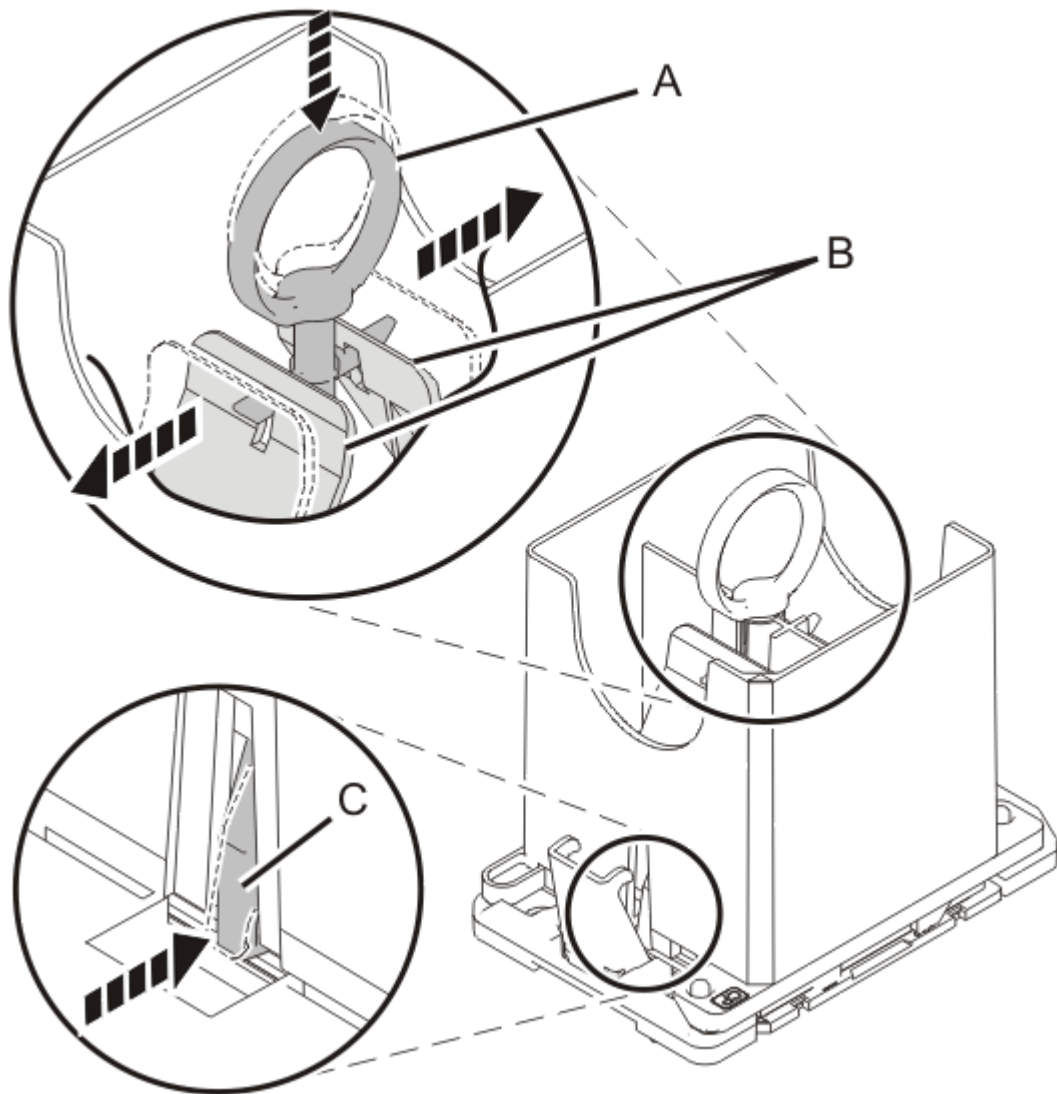


P9EIK583-0

Figure 146. Lowering the removal tool onto the system processor module

- c) With the removal tool sitting on top of the system processor module, push down on the ring **(A)** to close the latches **(C)** and lock the system processor module into the tool. Make sure that both of the tool jaws are locked on the system processor module.

See [Figure 147](#) on page 162.

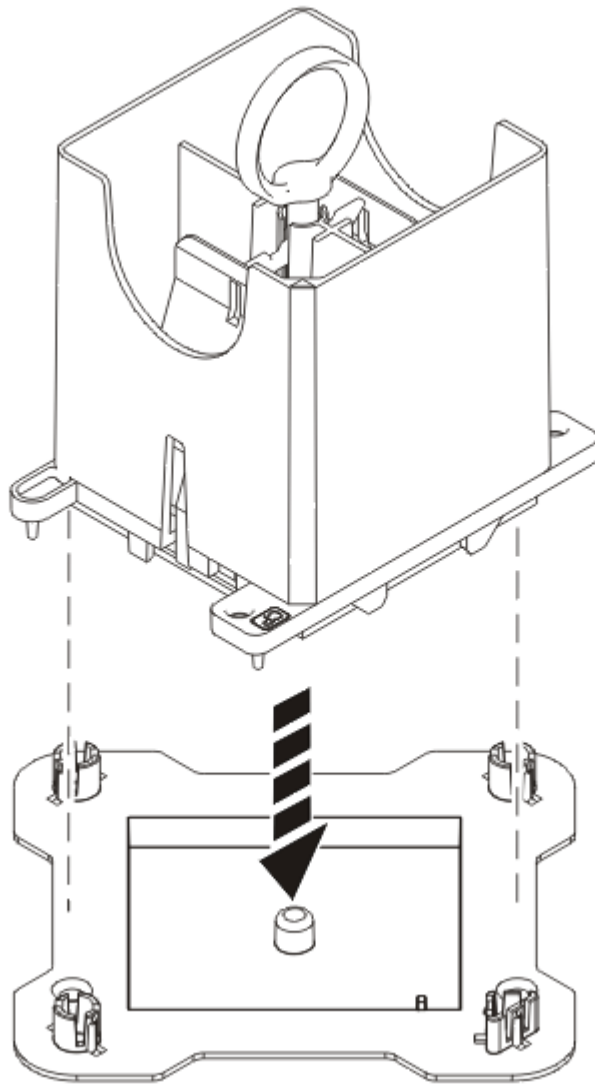


P9EIK581-0

Figure 147. Locking the system processor module into the tool

8. 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 148](#) on page 163.

Note: Set the tool and system processor module at an angle on the top cover of the system processor module packaging. That makes the module easier to pick up and place into the package.

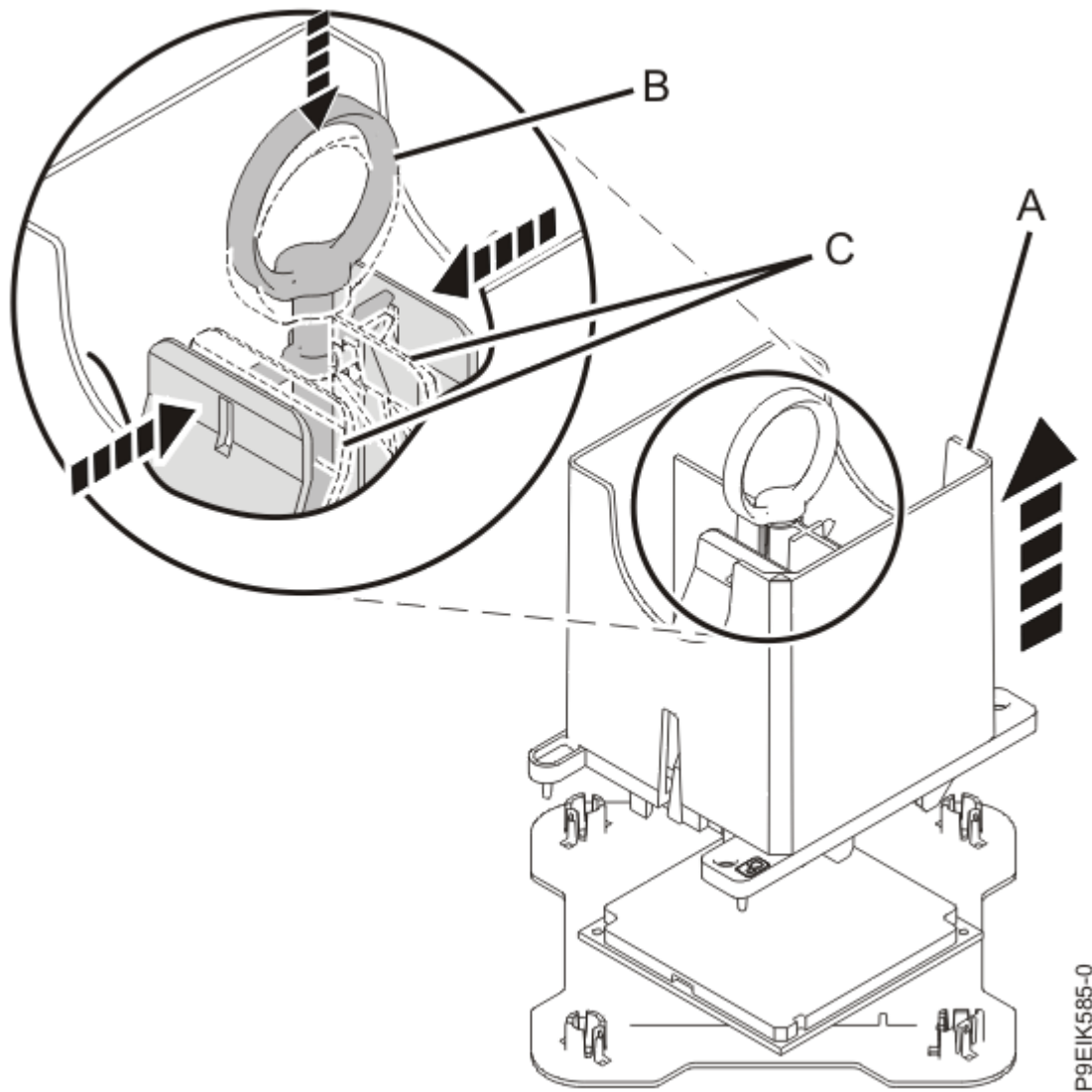


P9EIK588-0

Figure 148. Placing the tool at an angle on the top cover of the packaging

9. Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 149](#) on page 164.



P9EIK585-0

Figure 149. Releasing the system processor module from the tool

Replacing a system processor module in a 8335-GTW or 8335-GTX system

To replace a system processor module, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Remove dust and debris from the system processor socket area.
If dust or debris is present, use the supplied air pump to clean the system processor socket area.
3. Prepare the system processor module for installation:
 - a) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.
See [Figure 150](#) on page 165.

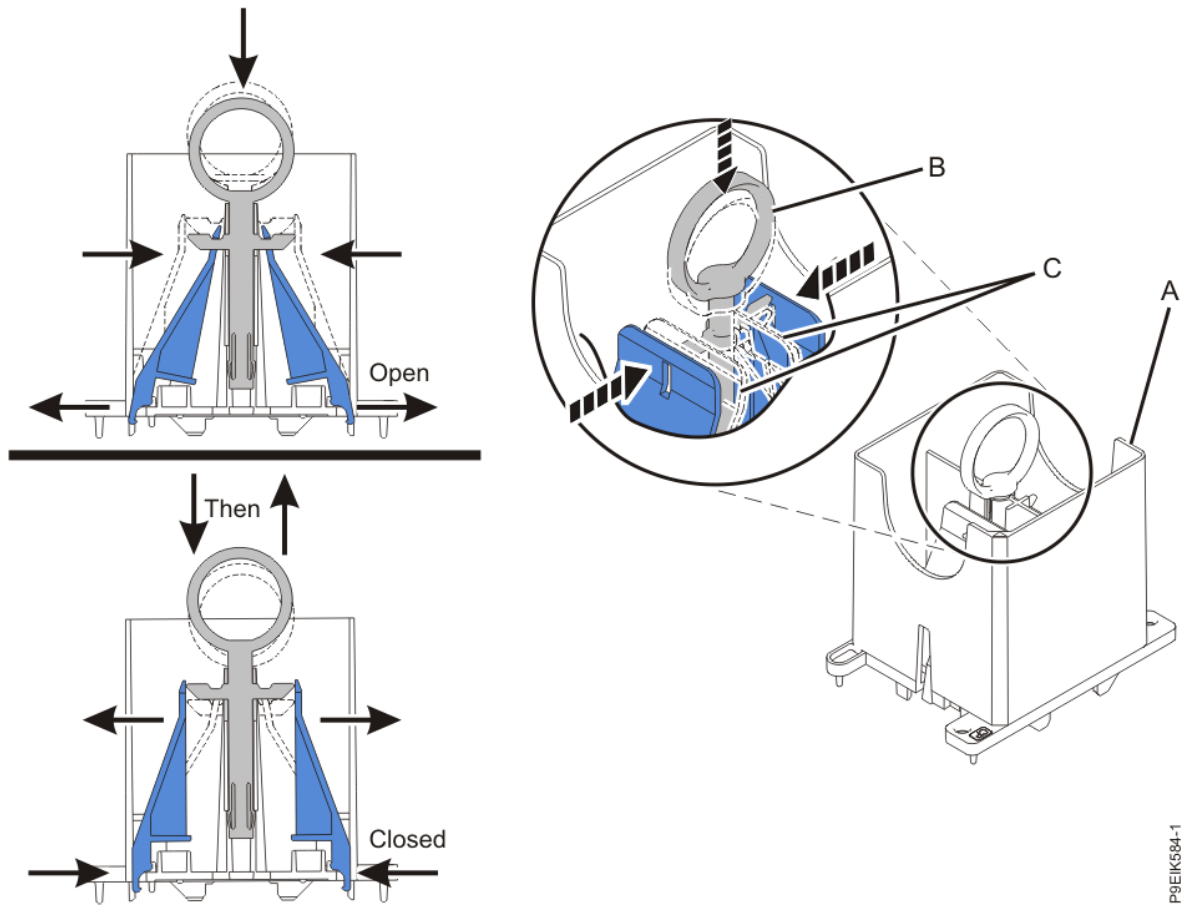


Figure 150. Opening the processor removal tool latches

- b) Lower the tool over the system processor module while ensuring that the two guide pins **(A)** insert into the alignment holes **(B)** on each side of the tool.

See [Figure 151](#) on page 166.

P9EIK584-1

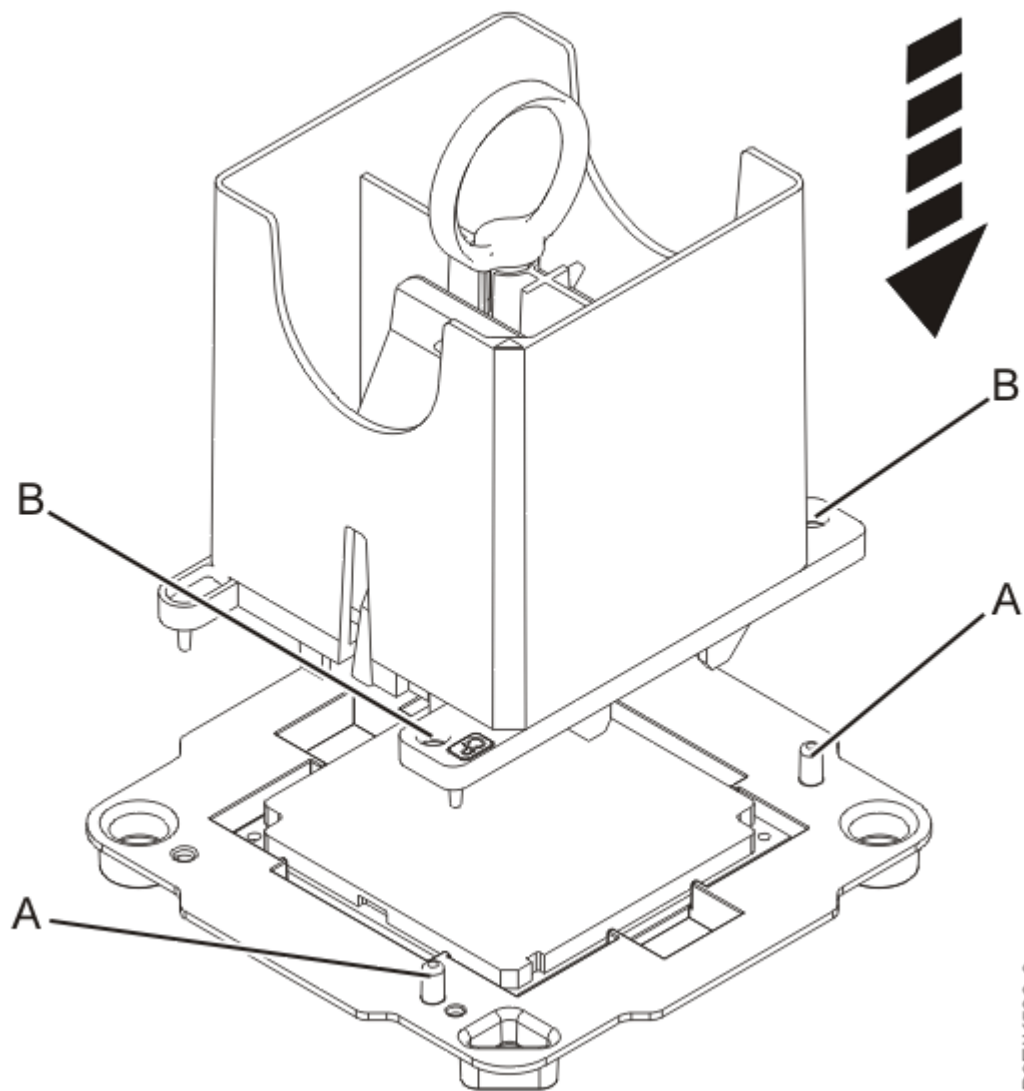


Figure 151. Lowering the removal tool onto the system processor module

- c) With the removal tool sitting on top of the system processor module, push down on the ring **(A)** to close the latches **(C)** and lock the system processor module into the tool. Make sure that both of the tool jaws are locked on the system processor module.

See [Figure 152](#) on page 167.

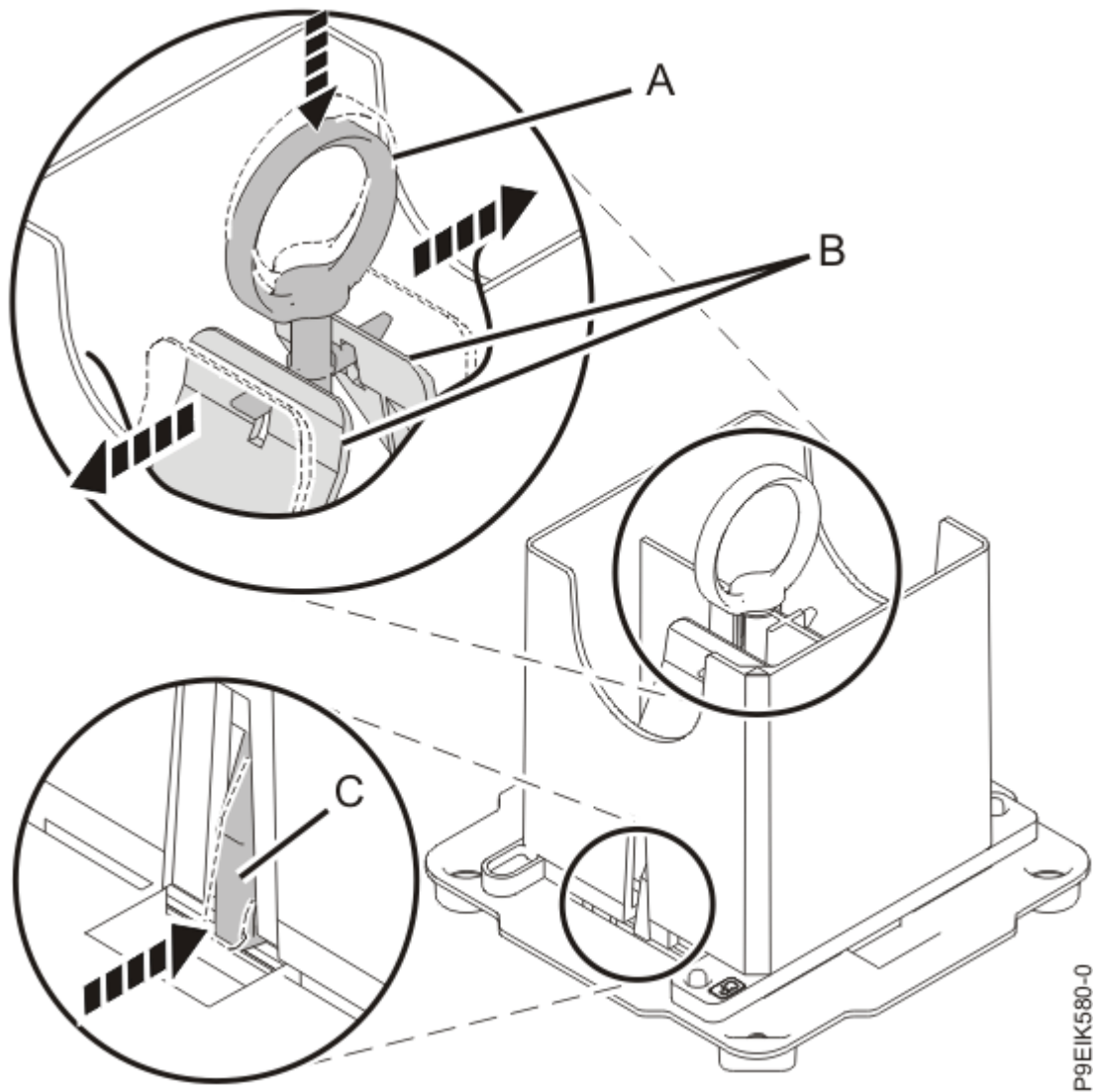
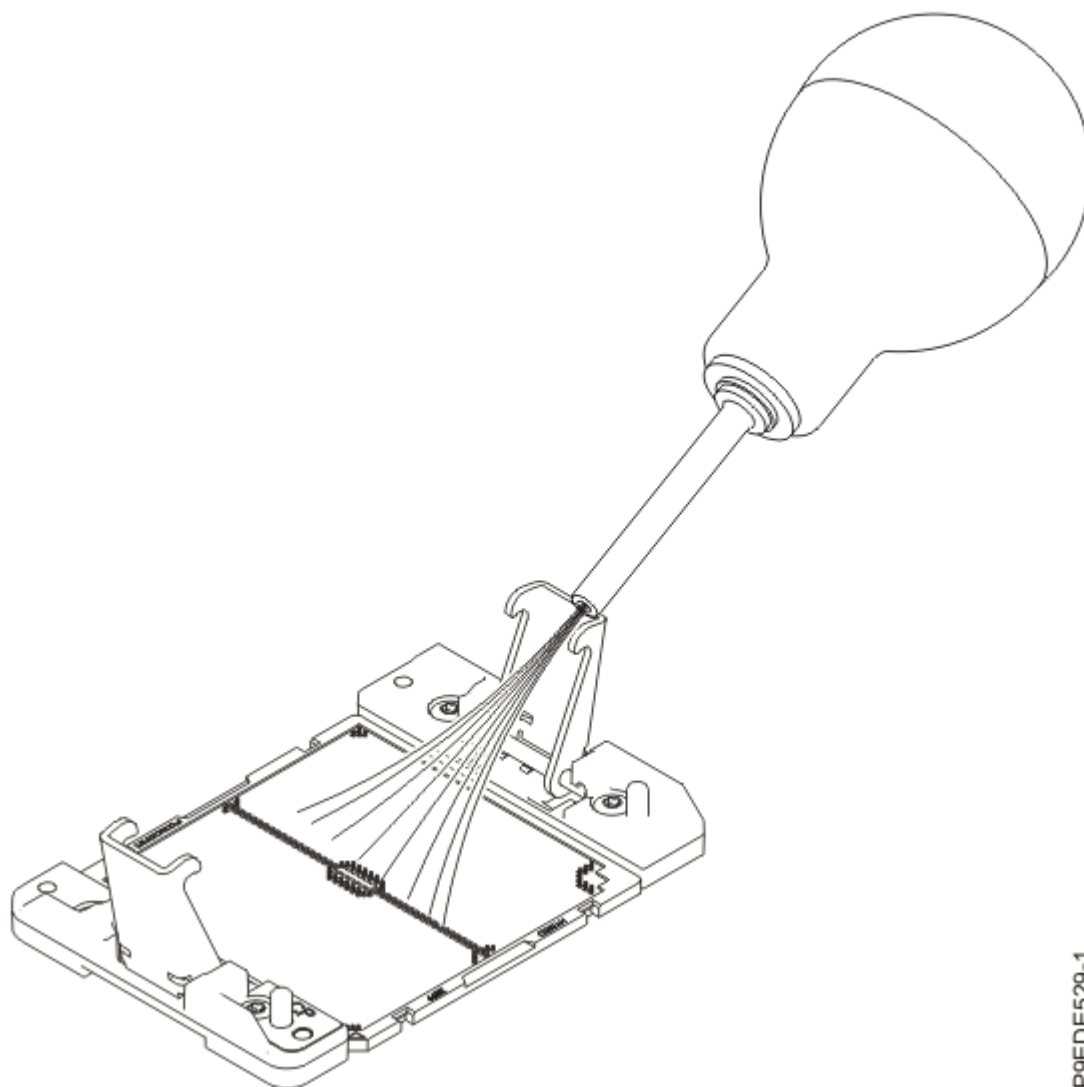


Figure 152. Locking the system processor module into the tool

4. Hold the sides of the tool with system processor module and carefully lift the tool out of the system processor module tray.
5. Install the system processor module:
 - a) If dust or debris is present on the system processor socket, use the supplied air pump to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown in [Figure 153](#) on page 168.



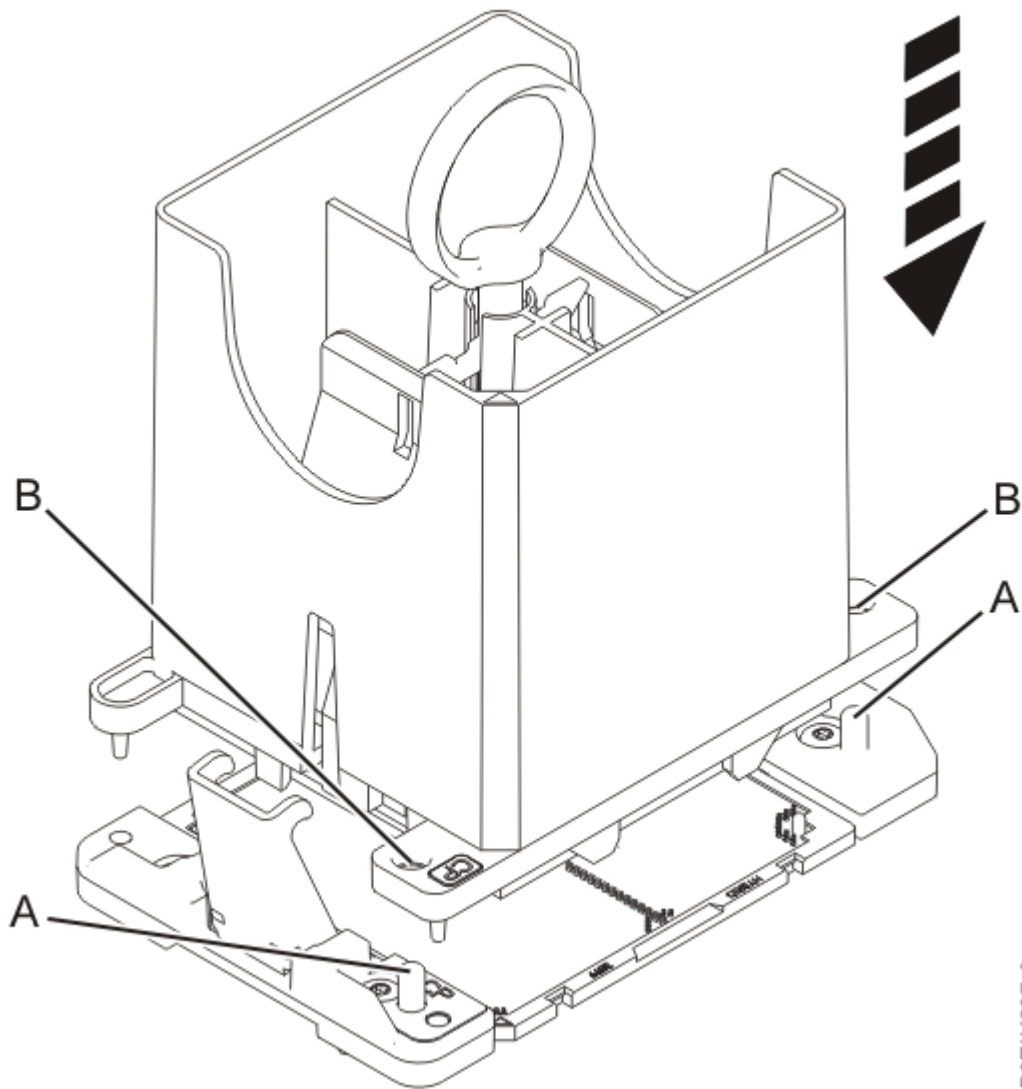
P9EDE529-1

Figure 153. Removing dust and debris from the system processor socket

- b) Lower the tool and system processor module onto the socket. Align the guide pins **(A)** with the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool.

See [Figure 154 on page 169](#).

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.

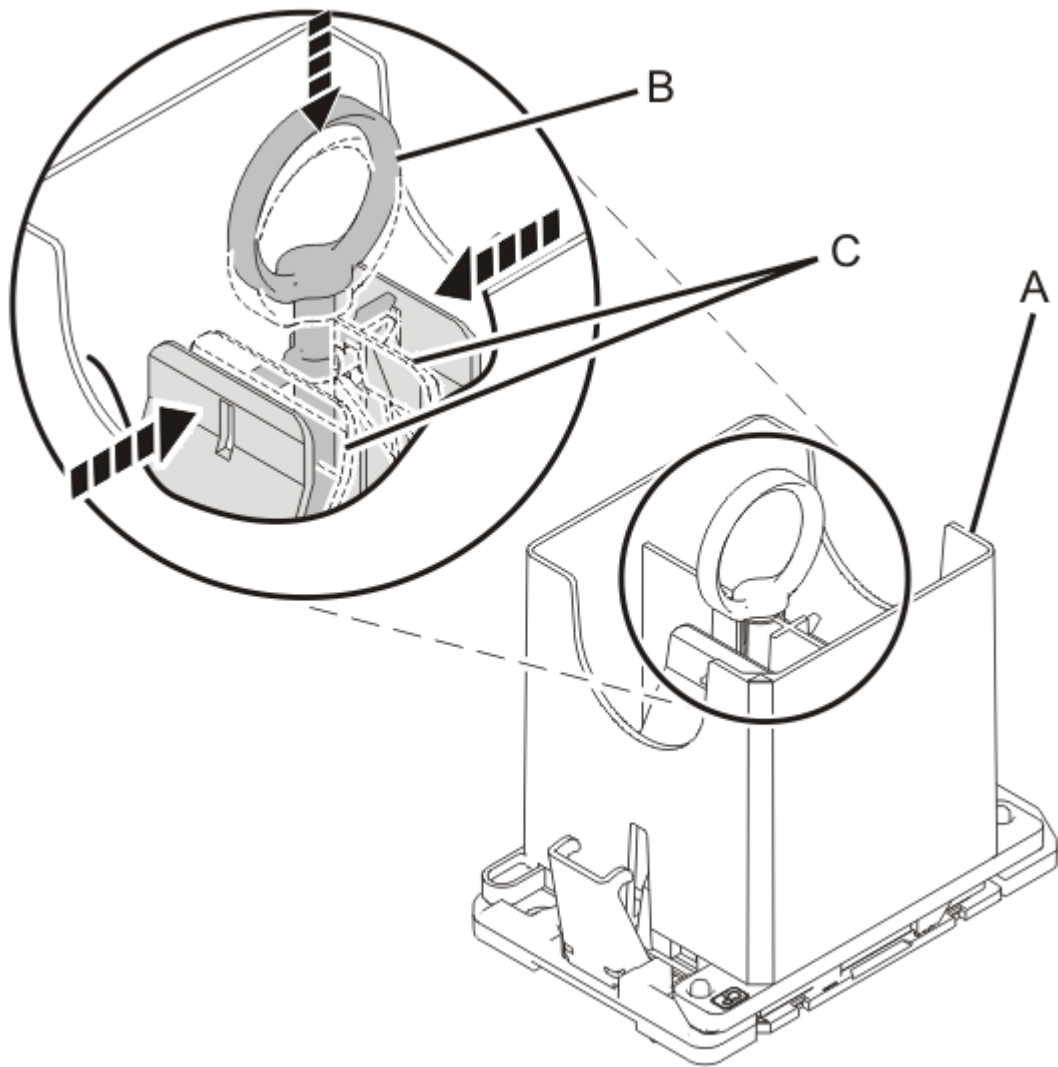


P9EIK587-0

Figure 154. Installing the system processor module

- c) Open the latches that hold the system processor module in the supplied removal tool **(A)**. Push down on the ring **(B)** while pressing in on the tabs **(C)**.

See [Figure 155](#) on page 170.



P9EIK582-0

Figure 155. Removing the system processor module tool

- d) Lift the tool off the system processor module.
6. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in [Figure 156](#) on [page 171](#). If you see folds, tears, bends, or if you have doubts about the TIM, replace it.

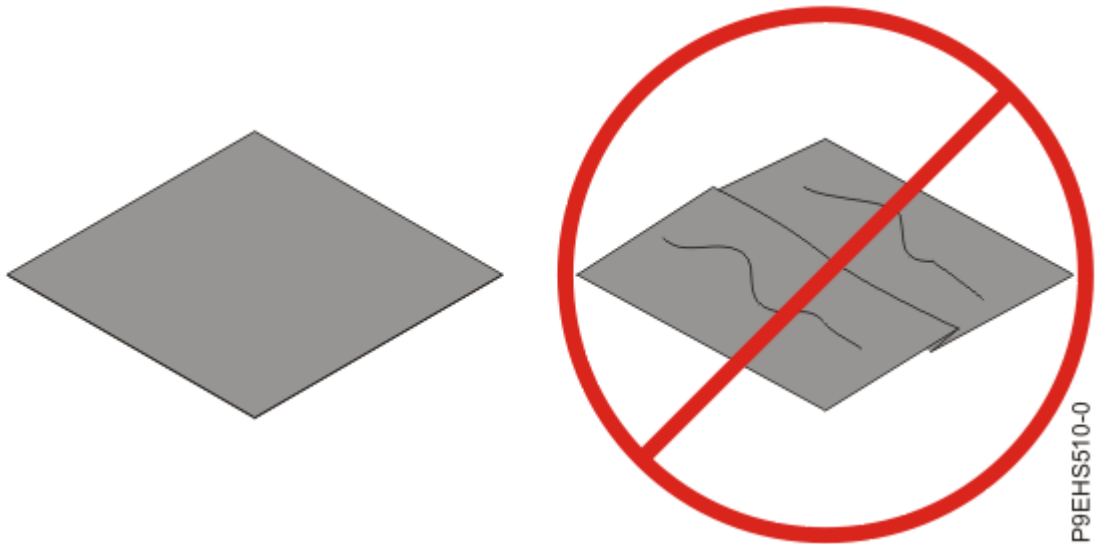


Figure 156. Inspecting the thermal interface material

7. Choose one of the following repair options:

Option	Description
Is the TIM damaged?	It is damaged. Proceed to step “8” on page 171 to replace the TIM and install the cold plate.
Is the TIM OK?	It is not damaged and can be reused. Proceed to step “9” on page 172 to move the TIM and install the cold plate.

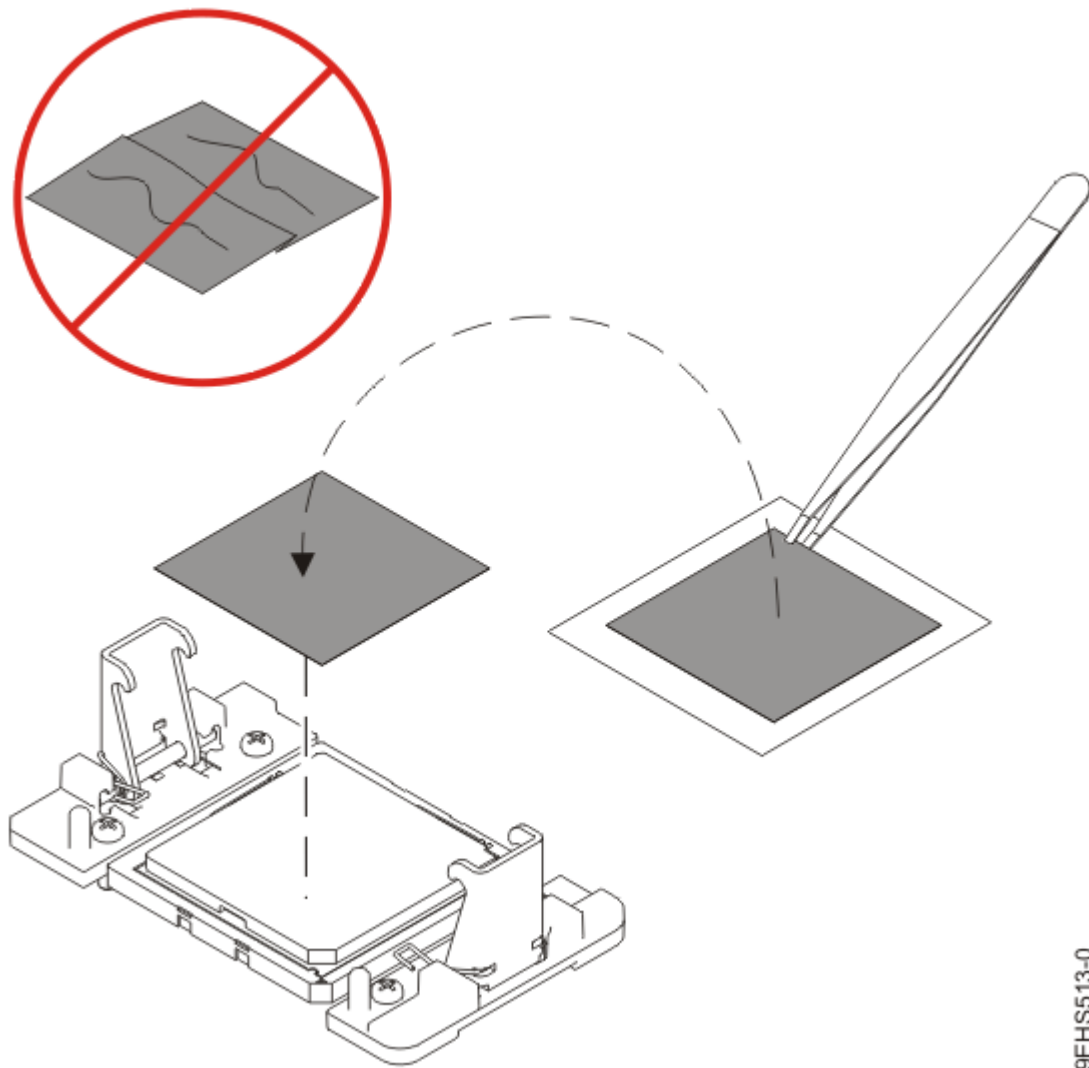
8. Use this step to install a new TIM and reuse the existing heat sink.

- 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 TIM has no preferred up side. The TIM can be placed on the system processor module and centered as shown in [Figure 157 on page 172](#).



P9EHS513-0

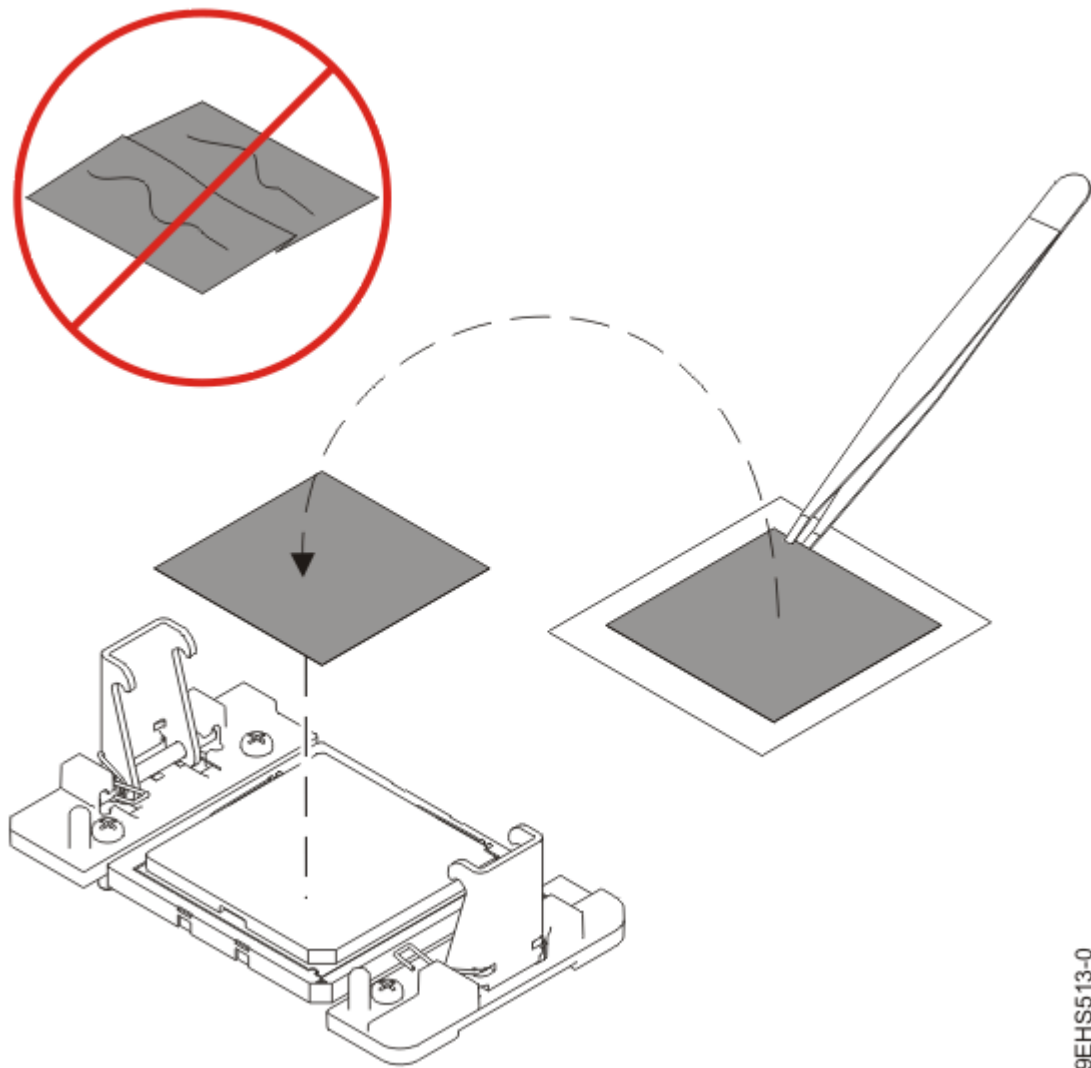
Figure 157. Installing a new TIM onto the system processor module

Continue with step “10” on page 173.

9. Use this step to reuse the existing undamaged TIM and heat sink.

- a) Using the tweezers, move the old TIM from the clean, dry surface and center it onto the new system processor module.

The TIM has no preferred up side. The TIM can be placed on the system processor module and centered as shown in [Figure 158 on page 173](#).

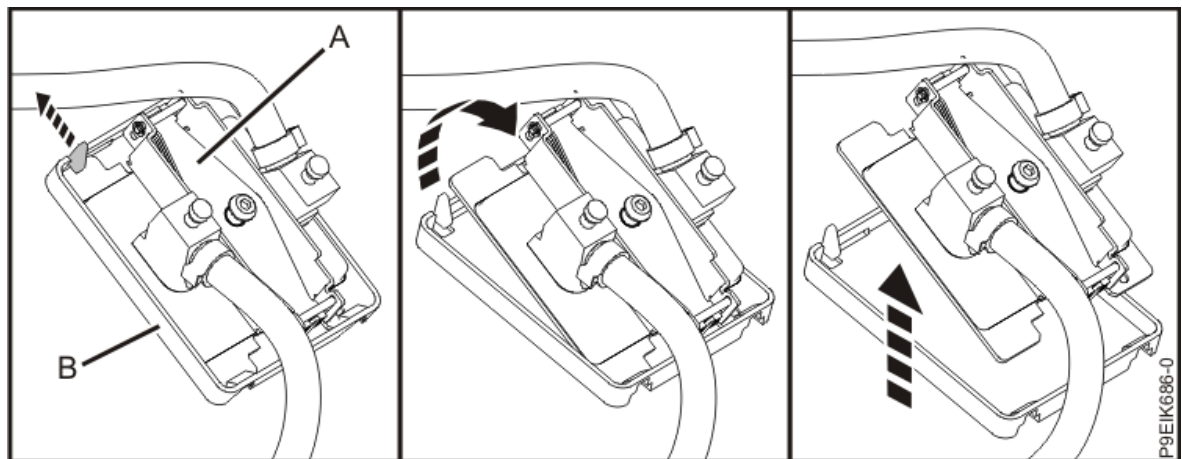


P9EHS513-0

Figure 158. Replacing the TIM onto the system processor module

10. Install the cold plate.

a) Remove the protective cover (B) from the cold plate (A) as shown in Figure 159 on page 173.

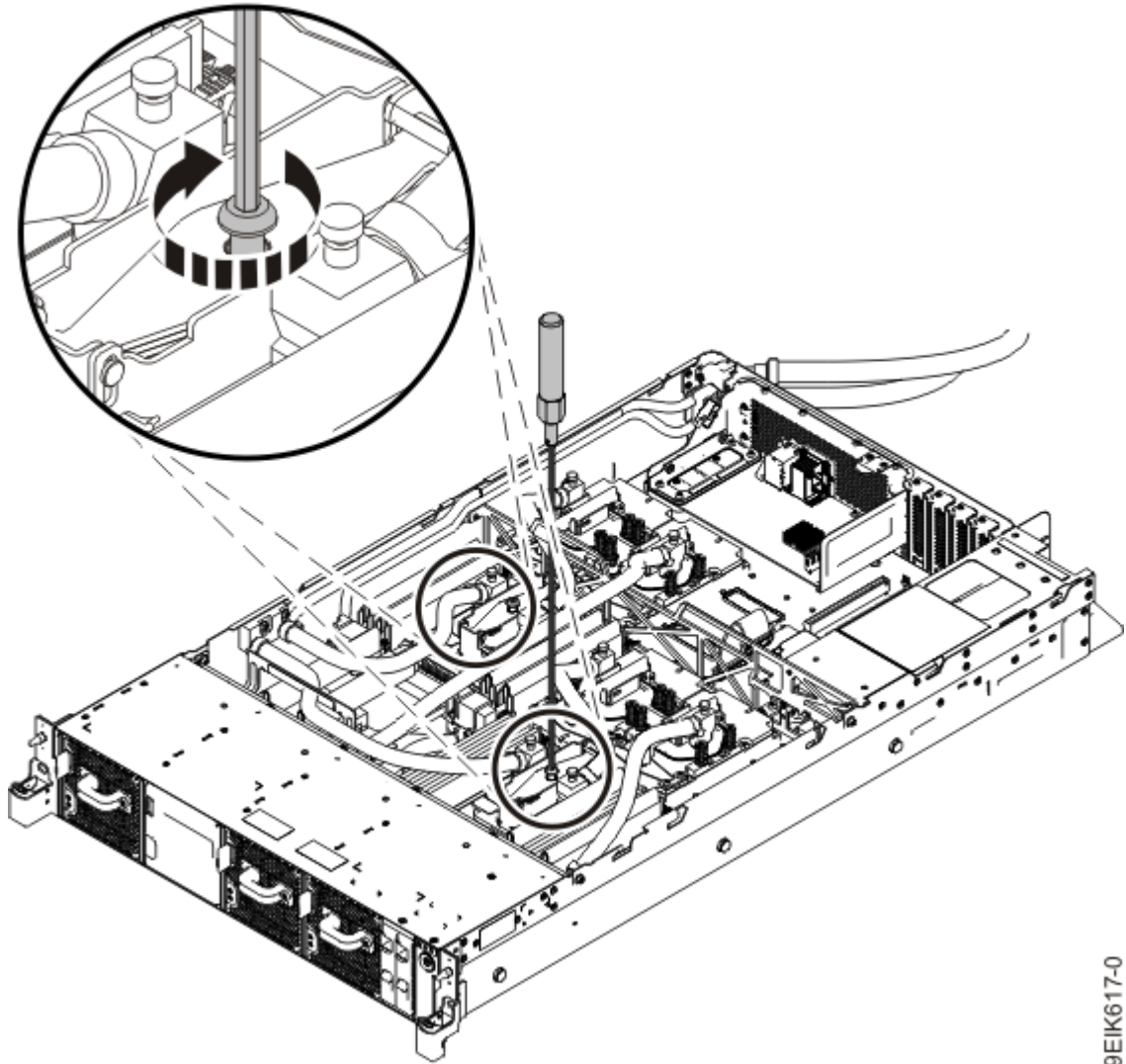


P9EIK686-0

Figure 159. Removing the protective cover from the cold plate

b) Using the alignment pins, carefully place the cold plate straight down onto the system processor module.

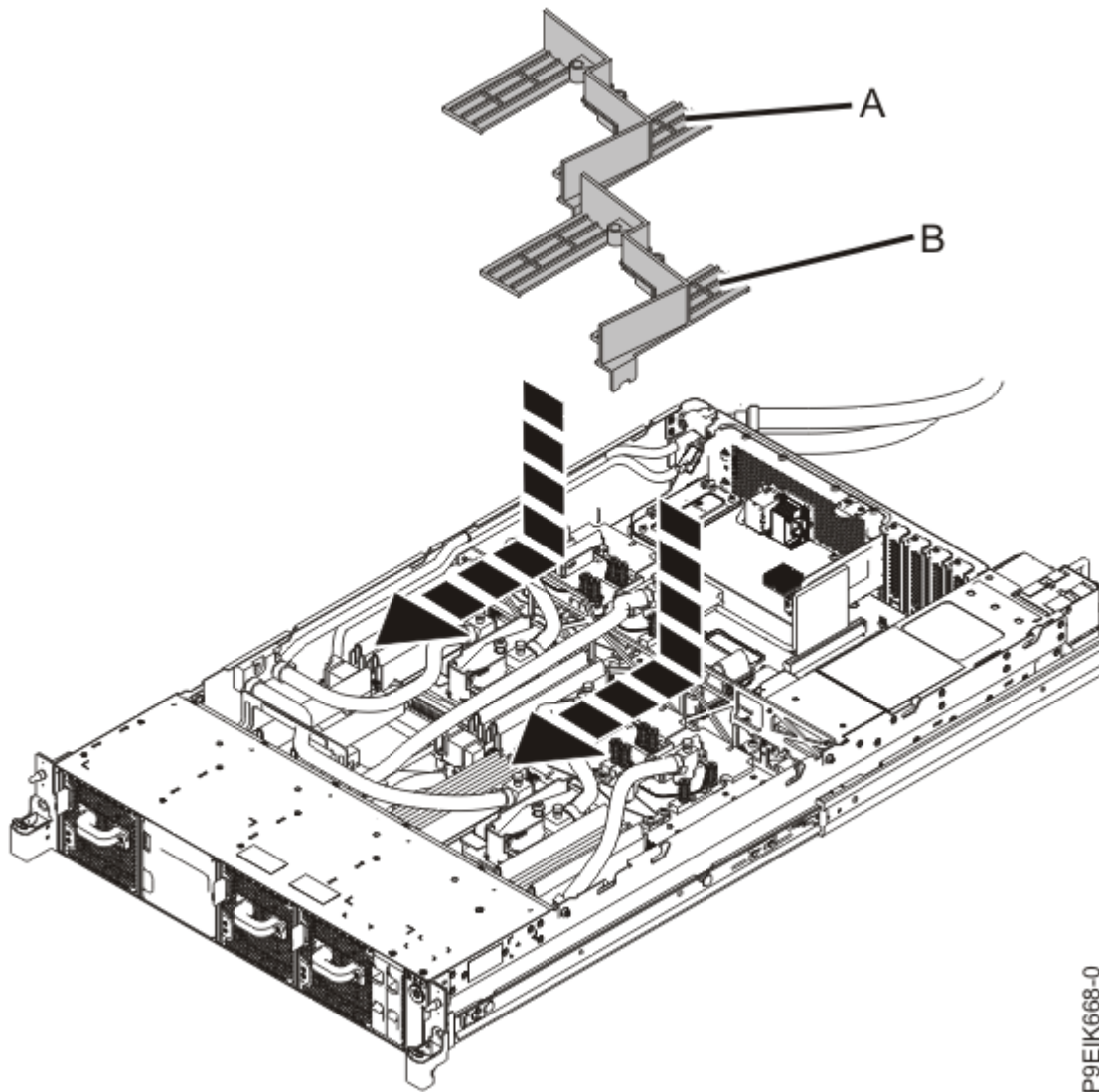
- c) Maintain slight downward pressure on the coldplate to ensure that it and the system processor module do not move.
- d) Tighten the cold plate retainer screw with the supplied hex key as shown in [Figure 160](#) on page 174.



P9EIK617-0

Figure 160. Tightening the cold plate retainer screw

11. Replace the air baffles **(A)** and **(B)** as shown in [Figure 161](#) on page 175. Carefully move the baffles around the hoses.



P9EIK668-0

Figure 161. Replacing the memory air baffles

12. Lightly grip the system processor module that you replaced by the edges and lift it off 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 162](#) on page 176. Close the packaging cover.

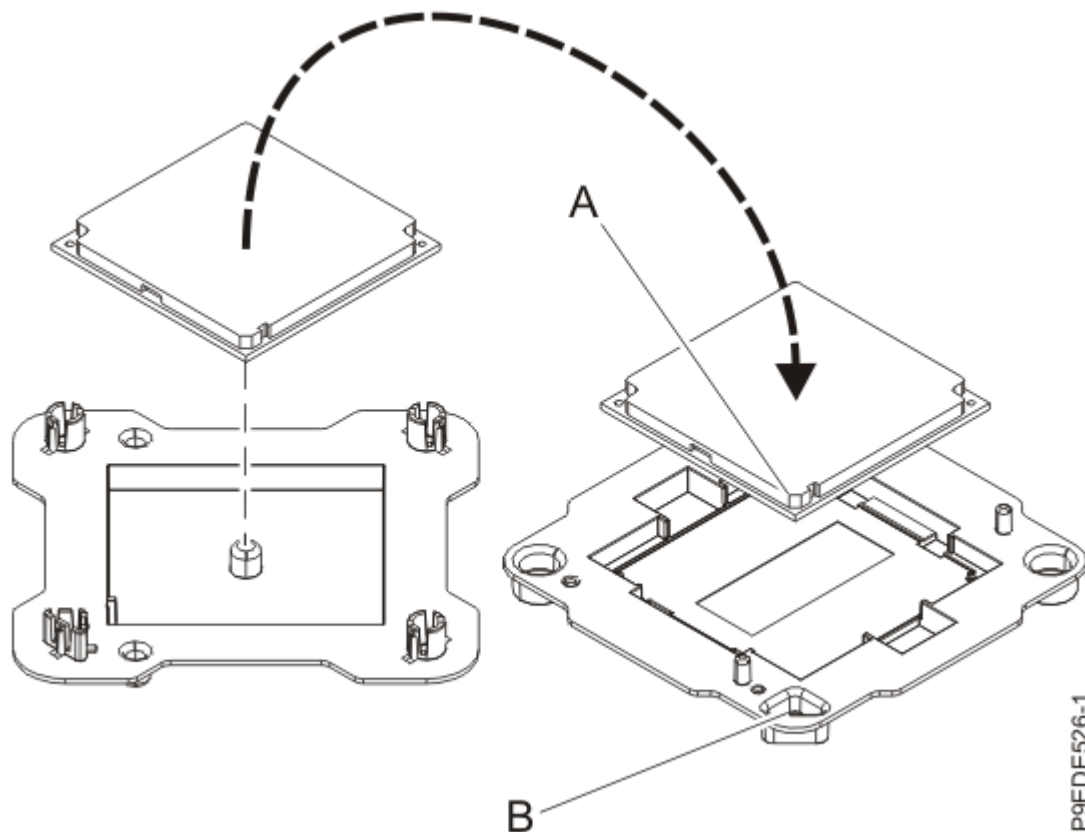


Figure 162. Placing the system processor module into the packaging

What to do next

Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Upgrading system processor modules in a 8335-GTW or 8335-GTX system

To upgrade system processor modules, complete the steps in this procedure.

Before you begin

8335-GTW or 8335-GTX systems do not support mixing system processors with different DDx.y levels. You should only complete this procedure if you are removing and replacing all of the system processor modules with new system processor modules.

Procedure

1. Review the following table to determine which firmware level is compatible with the new system processor modules you are installing.

System processor module level	Supported firmware level
DD2.1	OP910
DD2.2	OP920 or OP930
DD2.3	OP930

2. Update the system firmware to a version that is compatible with the new system processor modules you are installing.

For instructions, see [Getting fixes](#).

3. Remove all the system processor modules.

For instructions, see [“Removing a system processor module from the 8335-GTW or 8335-GTX system” on page 154.](#)

4. Replace all the system processor modules.

For instructions, see [“Replacing a system processor module in a 8335-GTW or 8335-GTX system” on page 164.](#)

Removing and replacing the time-of-day battery in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove and replace the time-of-day battery, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.

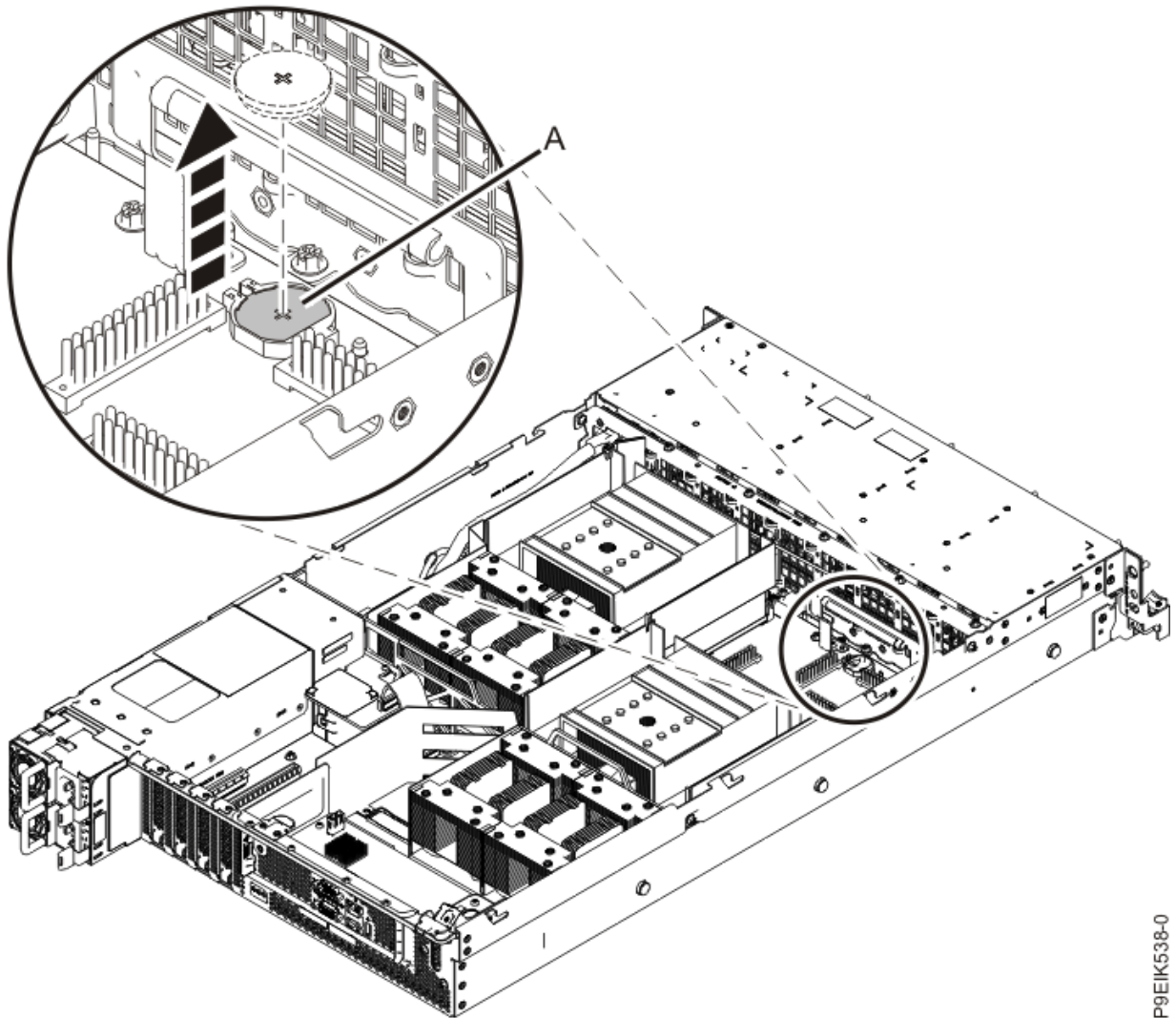


Attention:

- 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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

Removing:

2. Remove the time-of-day battery from its slot on the system backplane as shown in [Figure 163 on page 178.](#) Ensure that you record the orientation of the polarity of the battery so that you can insert it with the same orientation later.



P9EIK538-0

Figure 163. Removing the time-of-day battery from the system backplane

Replacing:

3. Insert the time-of-day battery in the slot on the system backplane as shown in [Figure 164 on page 179](#). Ensure to insert the battery with the correct polarity as recorded during removing of the battery.

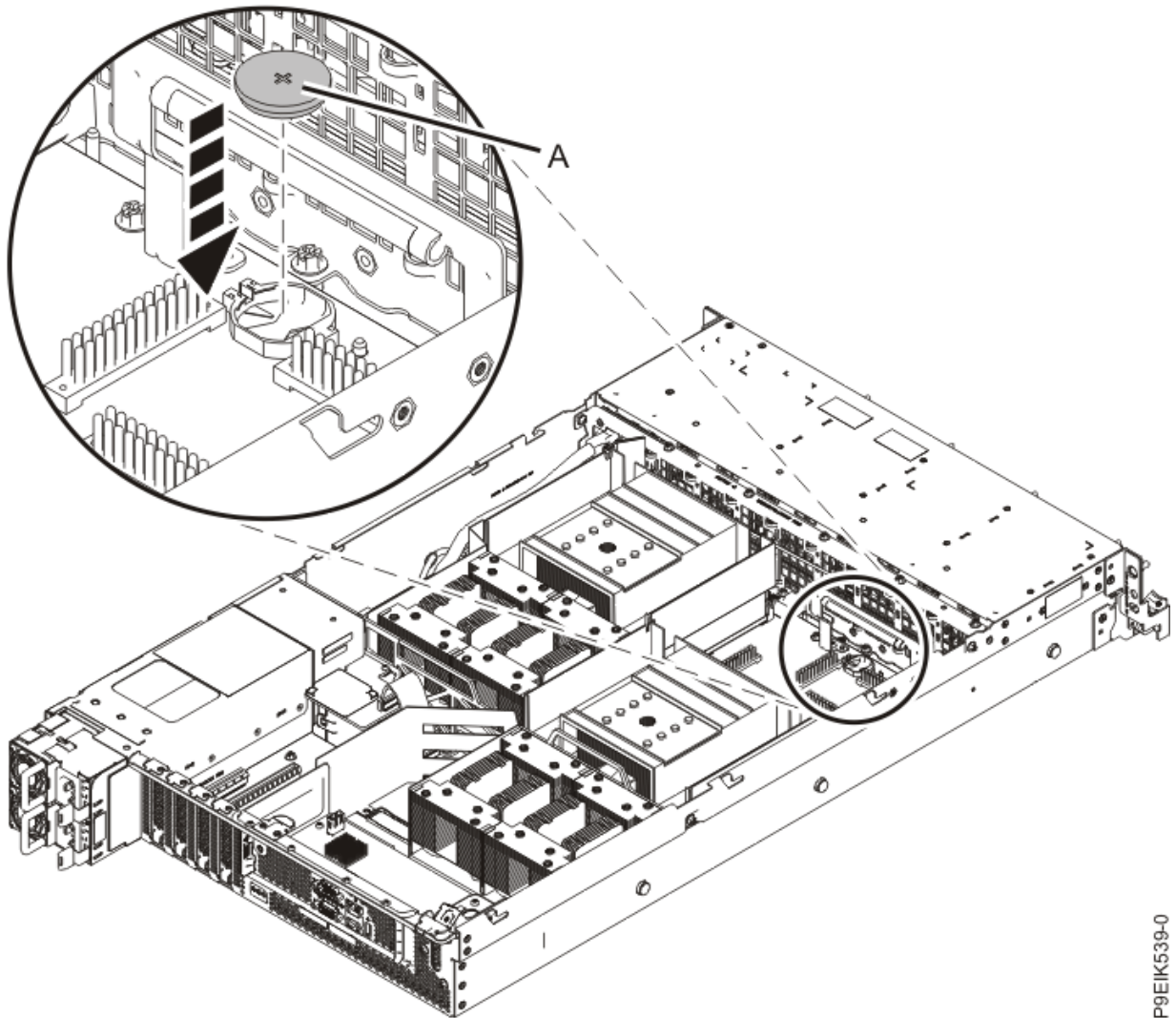


Figure 164. Replacing the time-of-day battery on the system backplane

What to do next

Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Removing and replacing the trusted platform module in the 8335-GTH or 8335-GTX system

Learn how to remove and replace a trusted platform module in the IBM Power System AC922 (8335-GTH or 8335-GTX) system.

Removing the trusted platform module from the 8335-GTH or 8335-GTX system

To remove a trusted platform module, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
2. Pull the lever **(A)** to release the trusted platform module (TPM), and lift the TPM straight up from the system backplane as shown in [Figure 165 on page 181.](#)

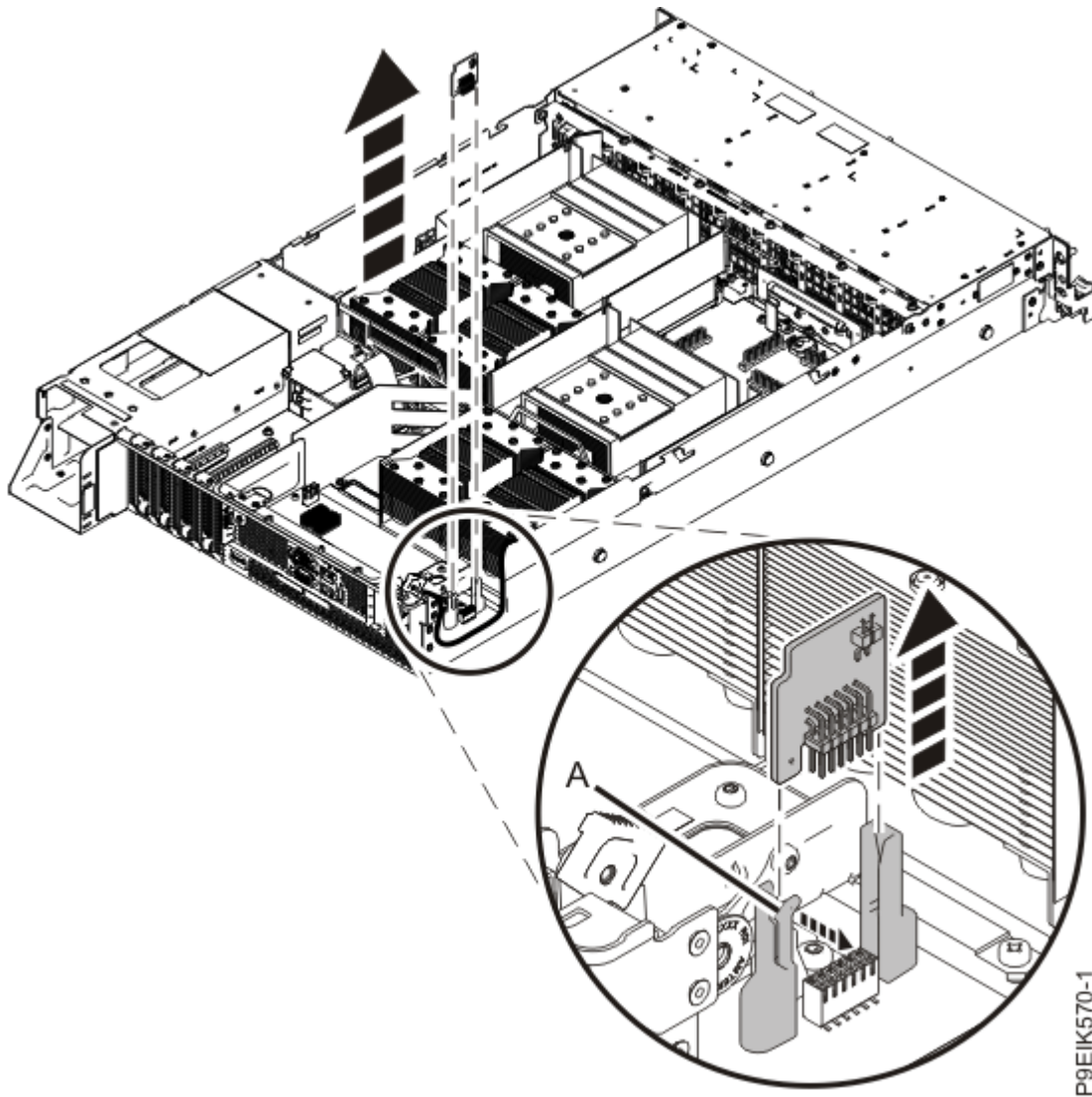


Figure 165. Removing the trusted platform module

3. Place the trusted platform module on an ESD mat.

Replacing the trusted platform module in the 8335-GTH or 8335-GTX system

To replace a trusted platform module, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Align the trusted platform module with the plastic guides as shown in [Figure 166 on page 182](#), and push the trusted platform module straight into the system backplane, until it is fully seated and the lever **(A)** clicks into place.

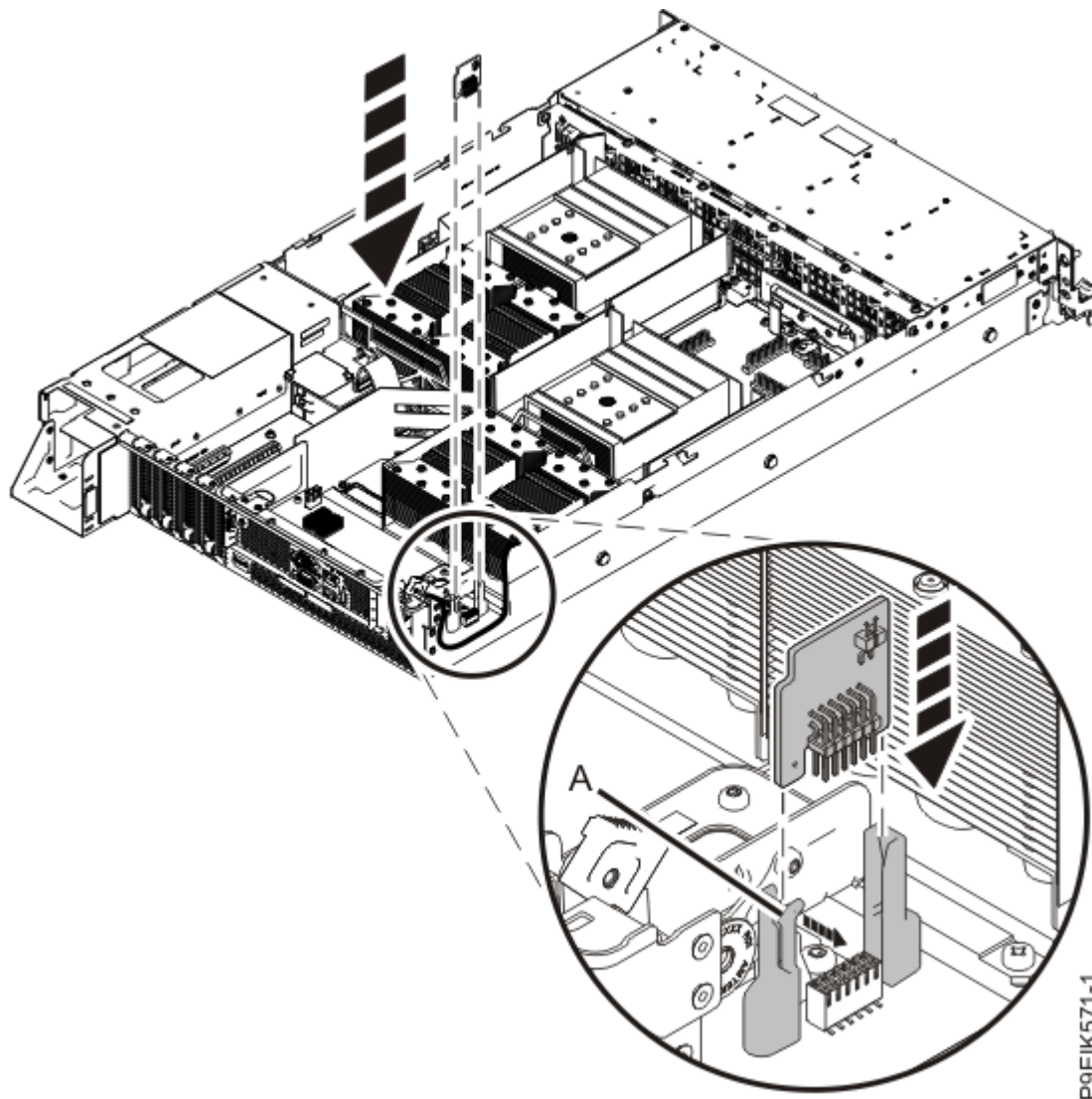


Figure 166. Replacing the trusted platform module

What to do next

Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.

Removing and replacing the USB cable and connector in the 8335-GTX system

Learn how to remove and replace the USB cable and connector in the IBM Power System AC922 (8335-GTX) system.

Removing the USB cable and connector from the 8335-GTX system

To remove a USB cable and connector, 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.

Procedure

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

2. Remove the disk drive and fan card.

For instructions, see [“Removing the disk drive and fan card from the 8335-GTW or 8335-GTX system”](#) on page 68.

3. Locate the 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 167 on page 184](#). Label each cable.

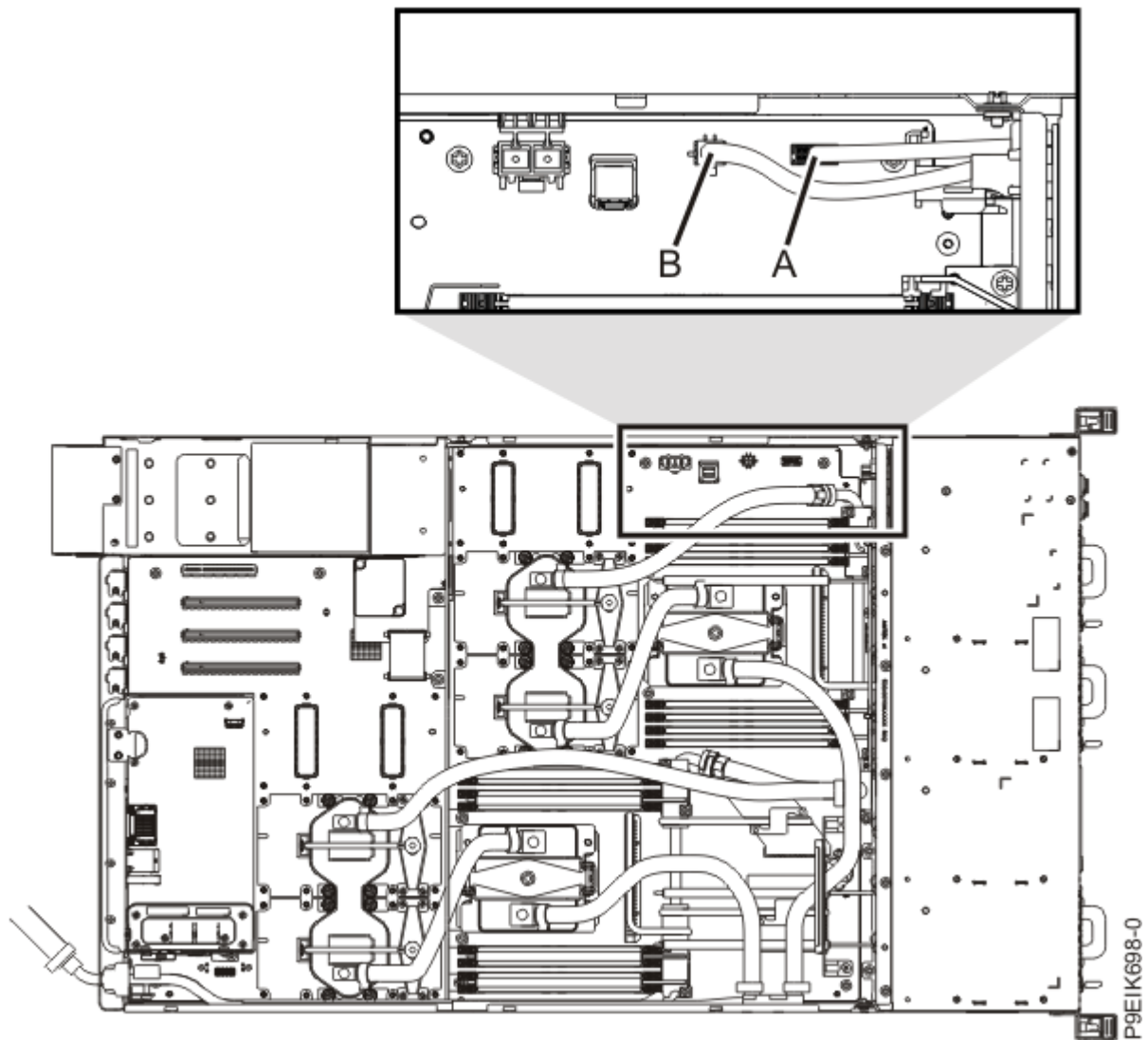
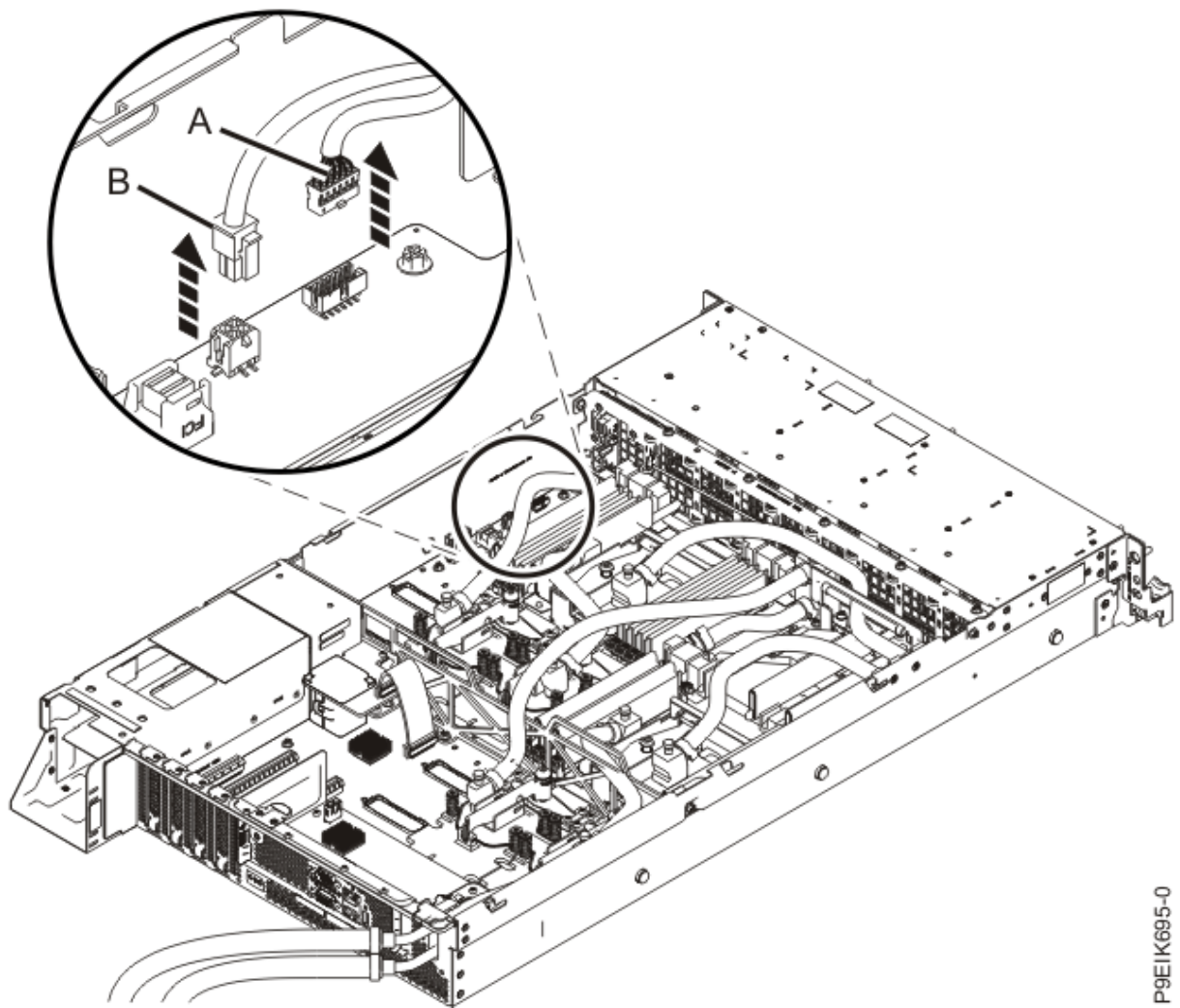


Figure 167. Location of the connectors for the USB cable and connector and the power switch and cable

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 power switch and cable **(A)** as shown in [Figure 168](#) on page 185.

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



P9EIK695-0

Figure 168. Removing the power switch and cable from the system backplane

6. Remove the rack installation support from the side of the system as shown in [Figure 169](#) on page [186](#).

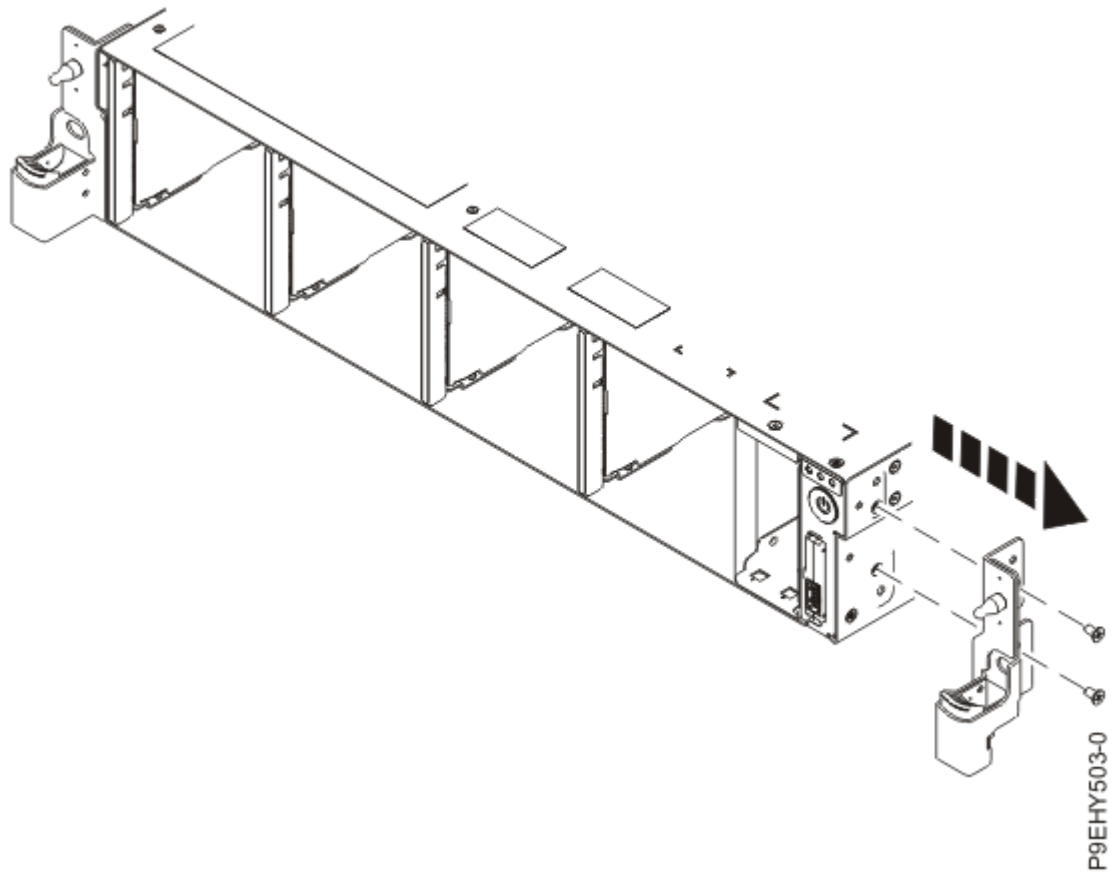


Figure 169. Removing the rack installation support

7. Remove the top and side screws from the power switch as shown in [Figure 170 on page 187](#).

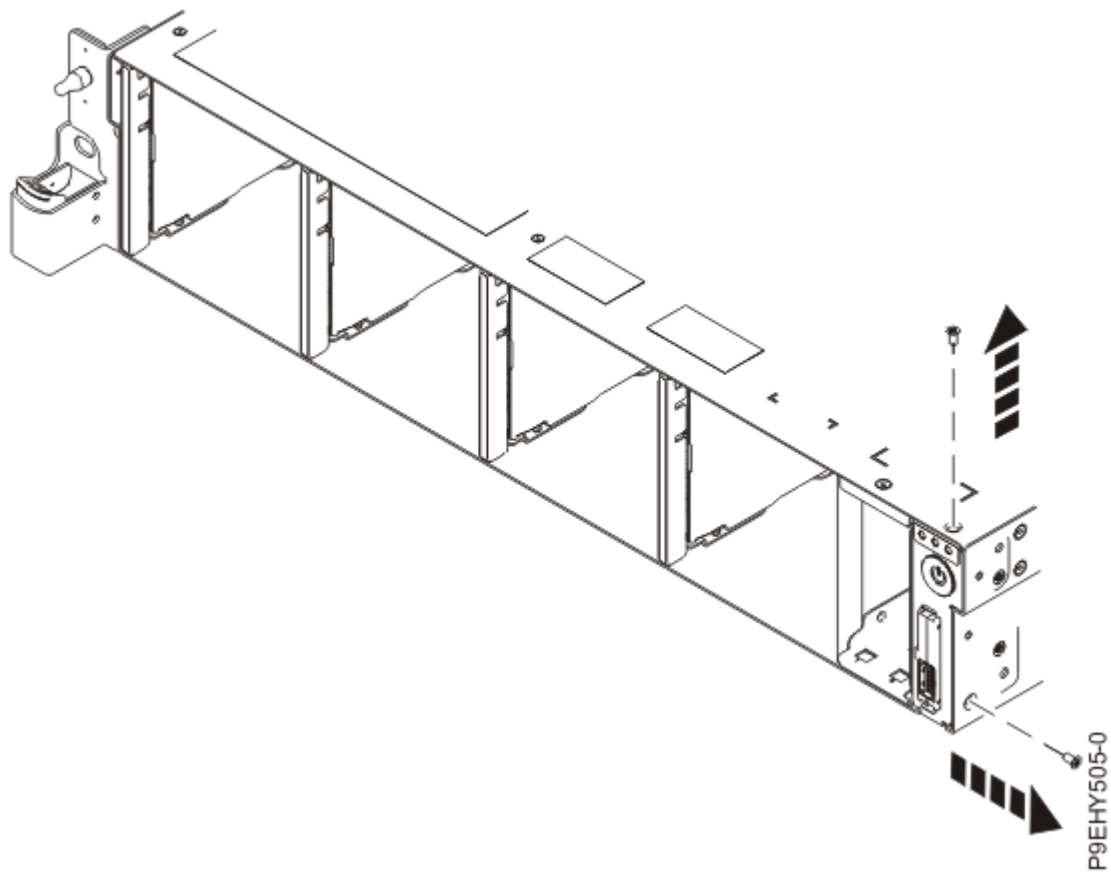


Figure 170. Remove the top and side screws

8. Pull the power switch from the system as shown in [Figure 171](#) on page 188.

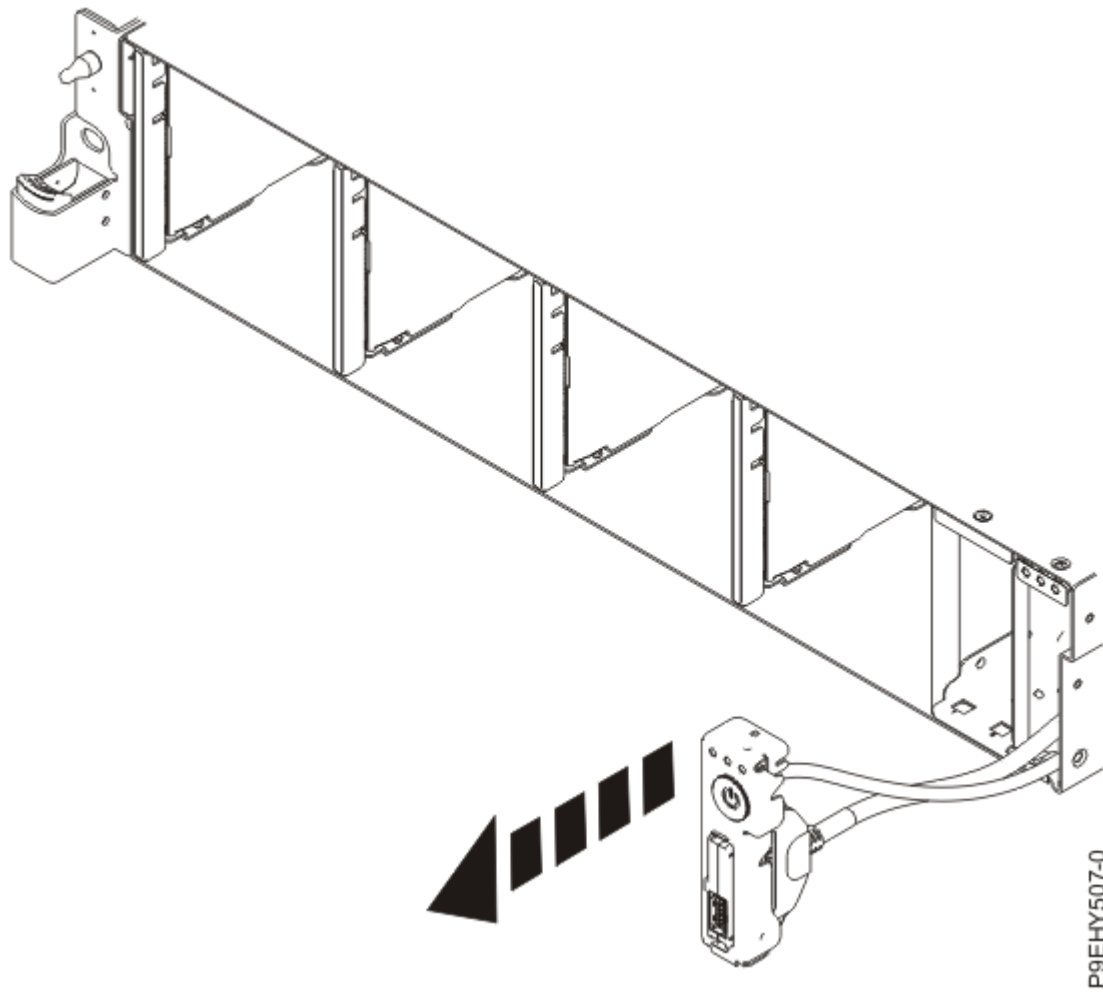


Figure 171. Pull out the power switch and cable

9. Pressing the latch releases **(A)** on the connector, disconnect the USB cable and connector from the power switch as shown in Figure 172 on page 188.

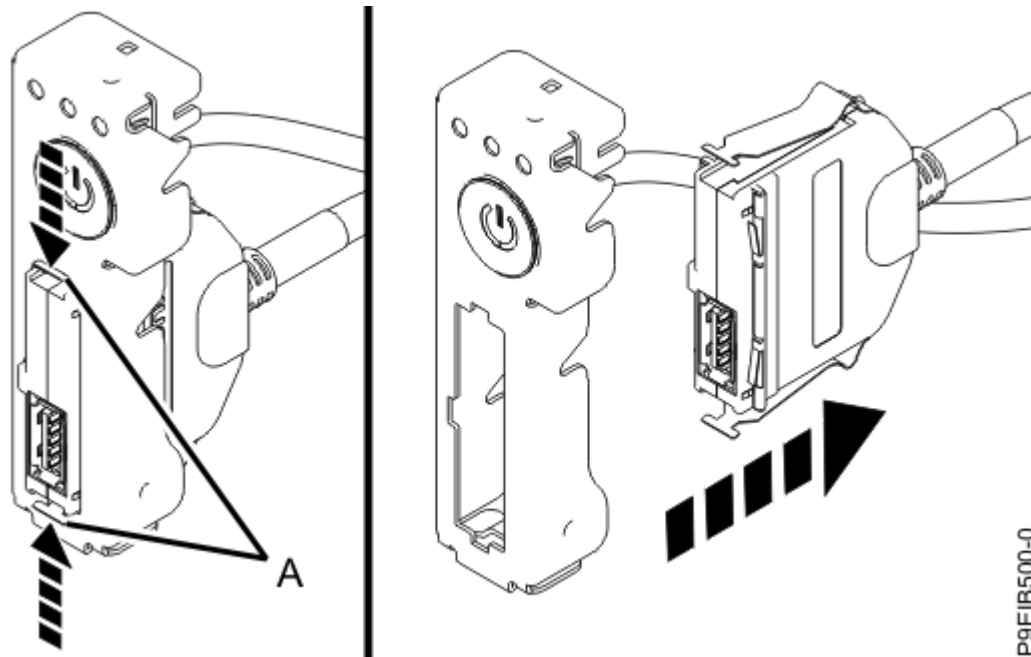


Figure 172. Removing USB cable and connector from the power switch

10. Place the USB cable and connector and the power switch and cable on the table.

Replacing the USB cable and connector in the 8335-GTX system

To replace a USB cable and connector, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Find the replacement USB cable and connector and remove it from the protective plastic envelope.
3. While you press the latches **(A)** in, connect the USB cable and connector to the power switch as shown in [Figure 173](#) on page 189.

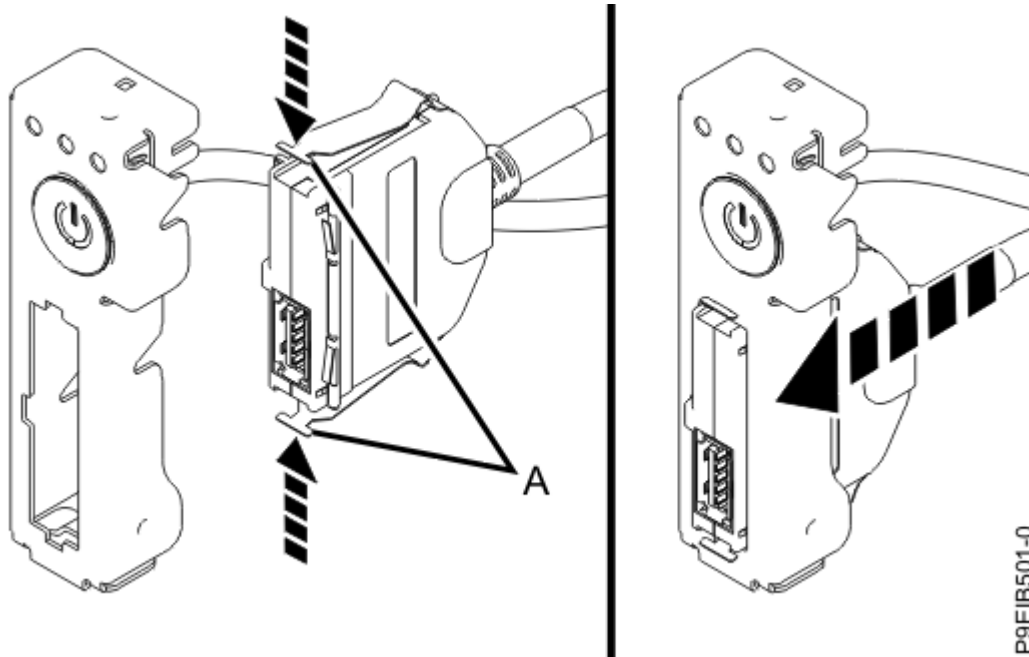


Figure 173. Attaching the USB cable and connector to the power switch

4. Insert the USB cable and the power switch and cable into the system as shown in [Figure 174](#) on page 190. Be careful to route the cables through to the system backplane.

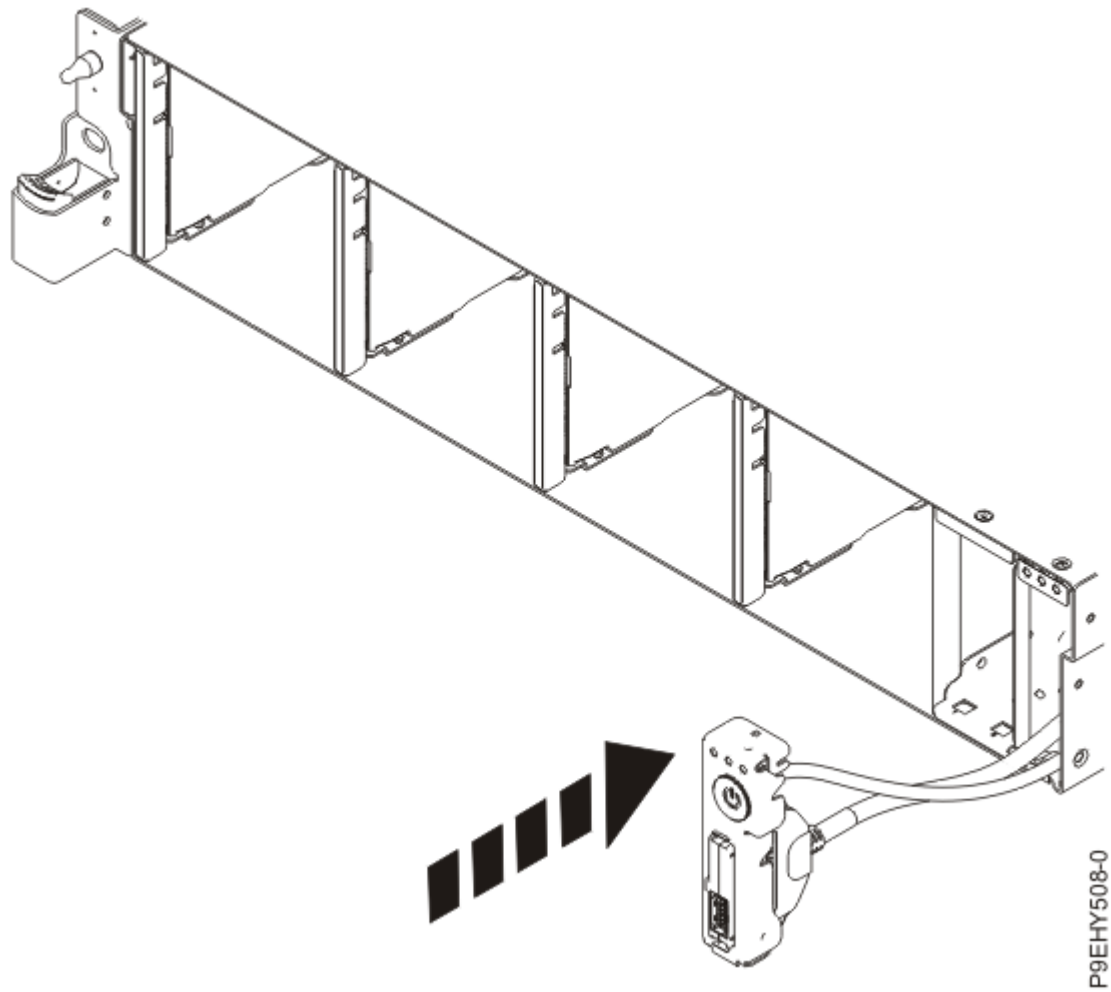


Figure 174. Replacing the front USB cable into the system backplane

5. Replace the top and side screws for the power switch as shown in [Figure 175 on page 191](#).

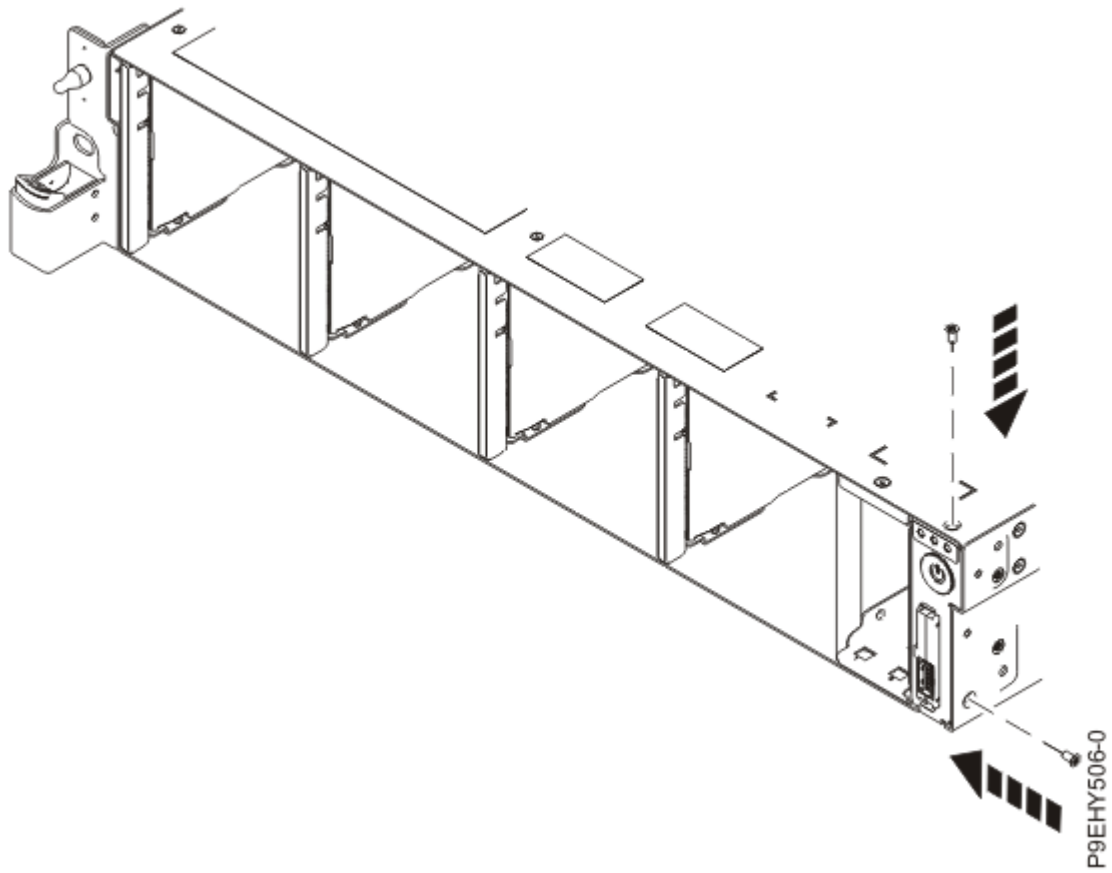
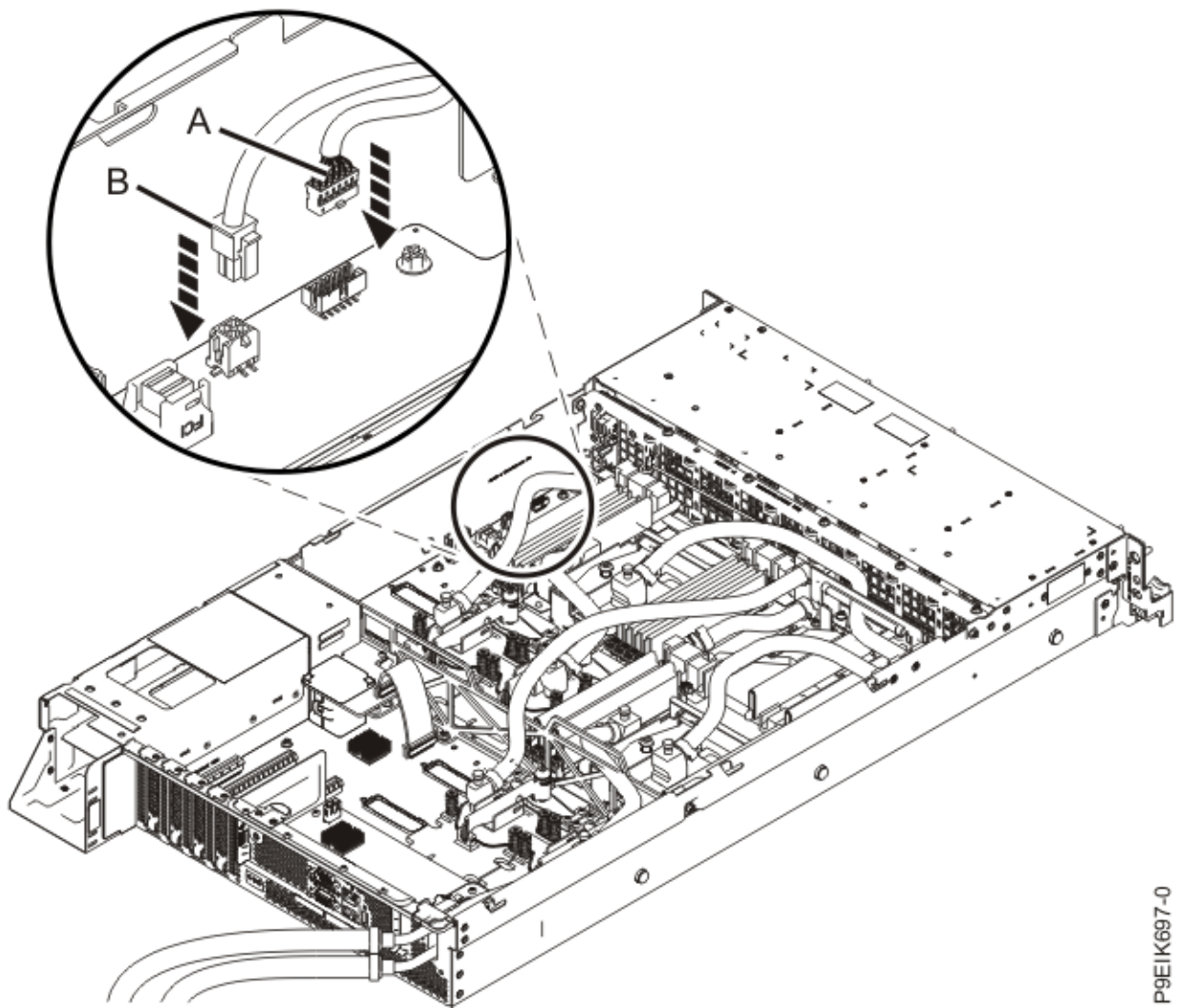


Figure 175. Replace the top and side screws

6. Using the labels, plug the USB cable **(A)** and the power switch and cable **(B)** to the system backplane as shown in [Figure 176](#) on page 192.

Ensure that the cable latch clip snaps into place on the connectors.



P9EIK697-0

Figure 176. Plugging in the cables

7. Replace the rack installation support on the side of the system as shown in [Figure 177](#) on page 193.

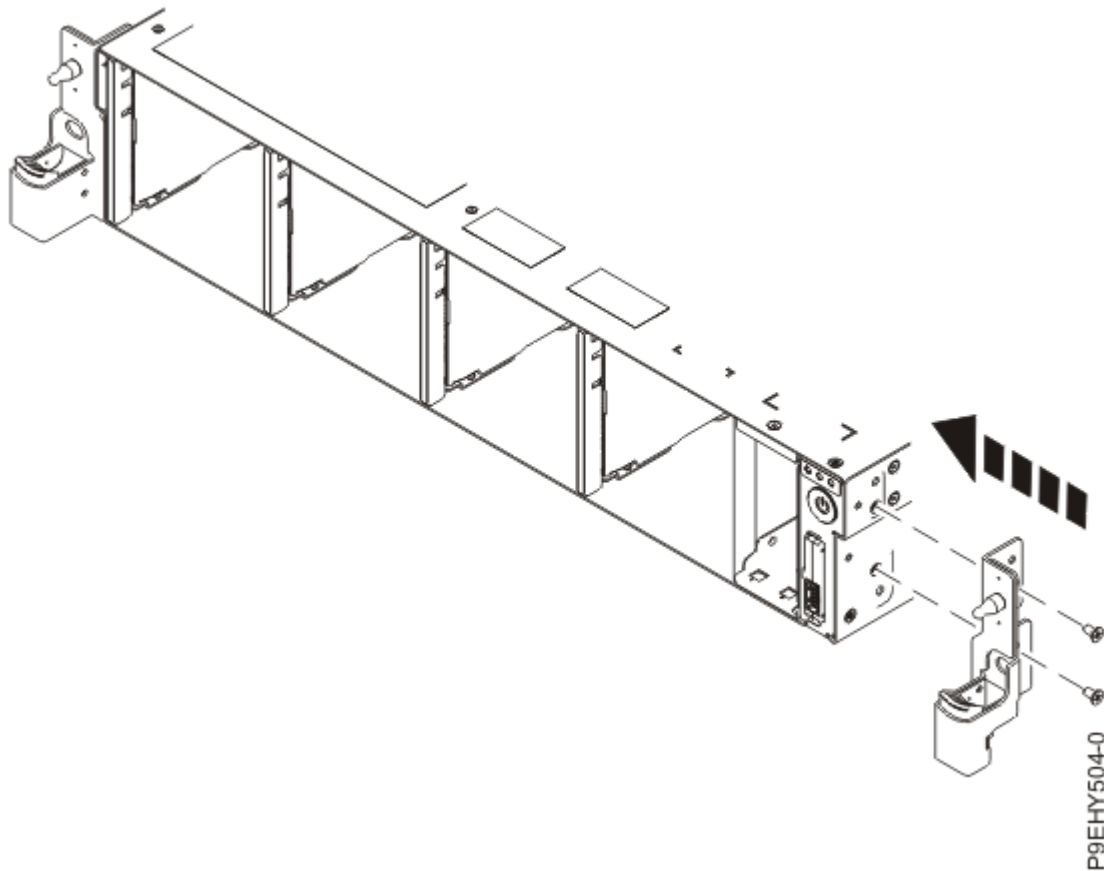


Figure 177. Replacing the rack installation support

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-GTW or 8335-GTX system” on page 74.](#)

What to do next

Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.](#)

Removing and replacing the water manifold for the 8335-GTW or 8335-GTX system

Learn how to remove and replace the water manifold in the IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Preparing the 8335-GTW or 8335-GTX system to remove and replace the water manifold

To prepare the system to remove and replace a water manifold, complete the steps in this procedure.

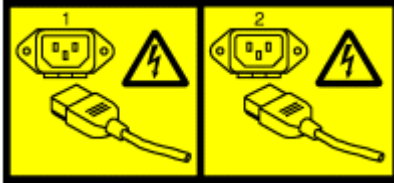
Procedure

1. Complete the prerequisite tasks. For instructions, see [“Before you begin” on page 209.](#)
2. Stop the system. For instructions, see [“Stopping the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system” on page 223.](#)

3. Repeat step "2" on page 193 for all the systems in the rack.
4. Disconnect the power source from the system by unplugging the system. For instructions, see ["Disconnecting power cords from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system"](#) on page 232.

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)



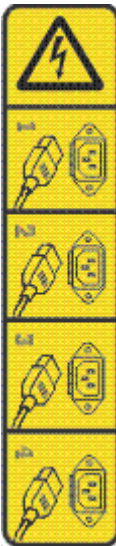
or



or

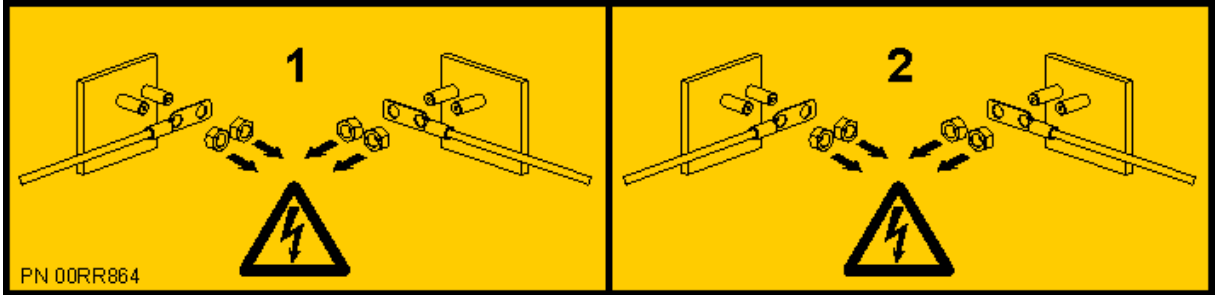



or



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)

5. Remove the power supplies from the system as shown in [Figure 178 on page 196](#).
 - a) To release a power supply from its position in the system, pull the locking-tab **(A)** to the left.
 - b) Grasp the power supply handle with one hand, and pull the power supply **(B)** partially 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.
 - d) Repeat steps “5.a” on page 195 - “5.c” on page 195 for the other power supply.

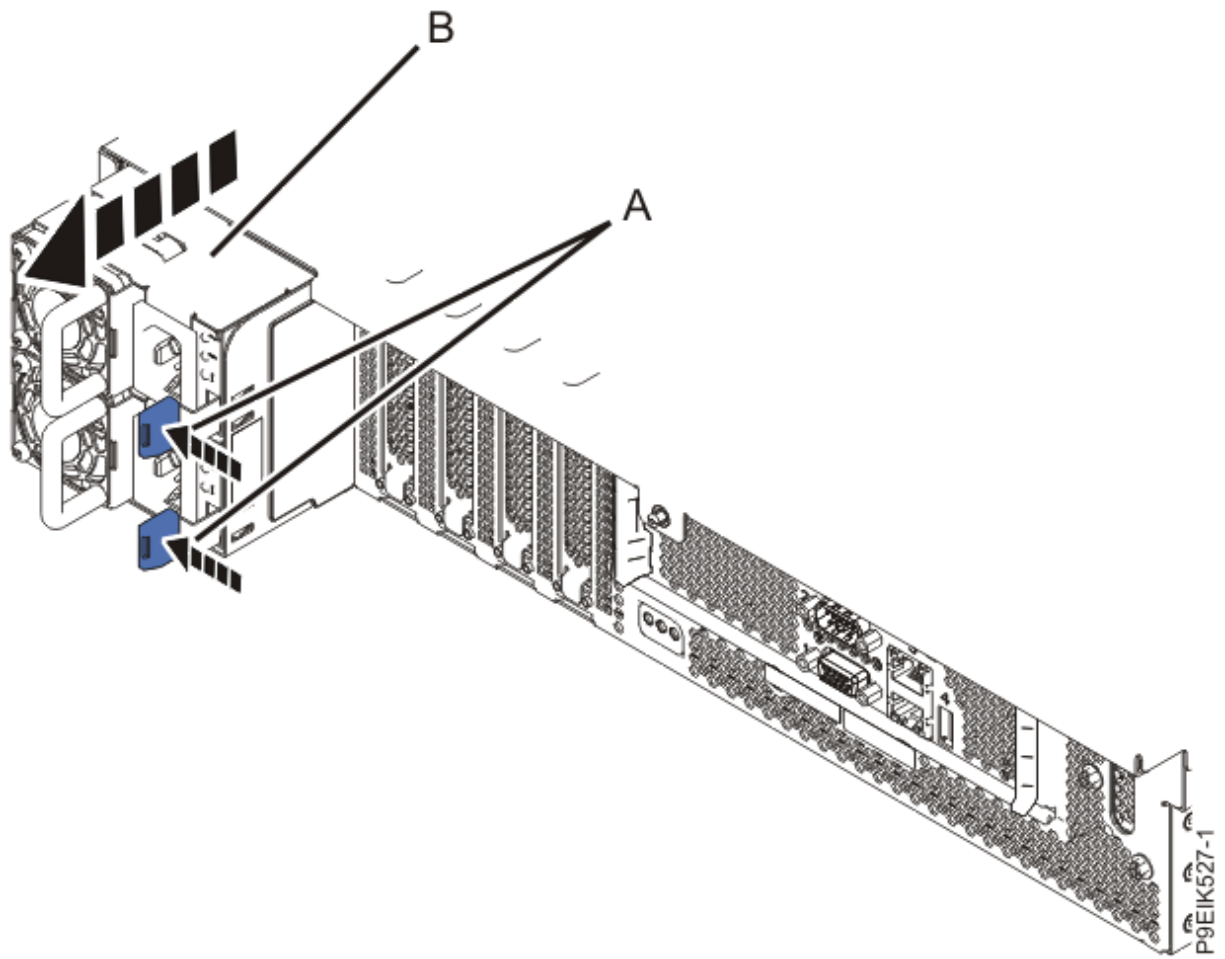


Figure 178. Removing the power supplies from the system

6. Repeat steps [“4” on page 194](#) - [“5” on page 195](#) 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 179 on page 197](#).

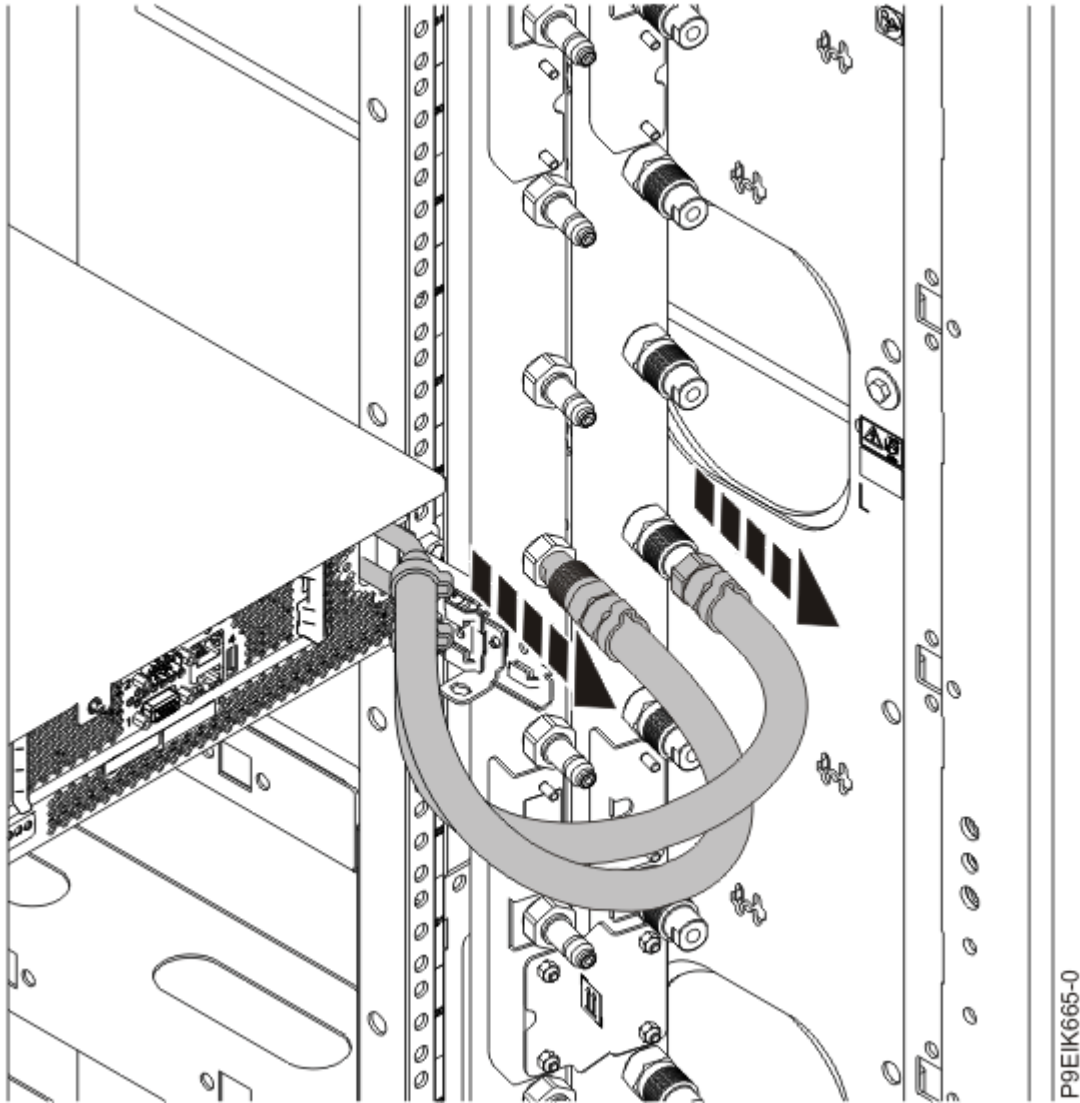


Figure 179. Disconnecting the water hoses

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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the service position” on page 227. If your rack has slider rails; remove the system from the rails.

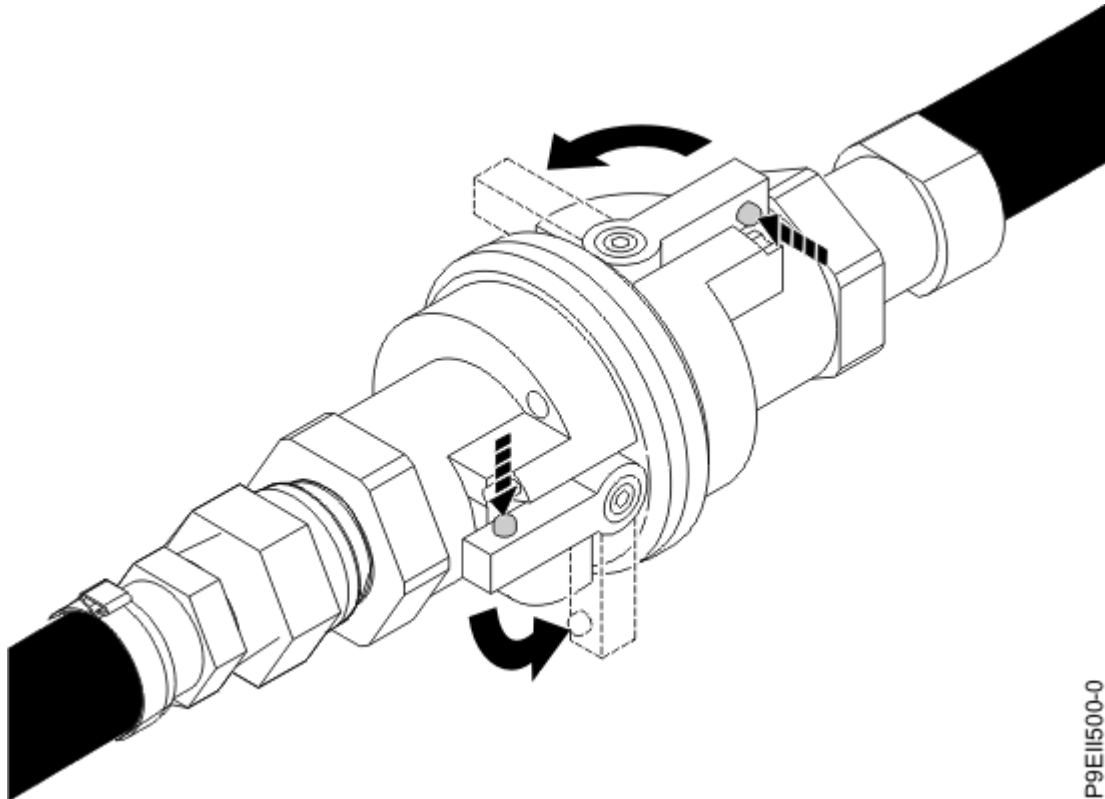
10. Remove the rack rail on the side of the rack where the manifold is mounted.
11. Repeat step “7” on page 196 through step “10” on page 197 for each system in the rack.

Removing the water manifold from the 8335-GTW or 8335-GTX system

To remove a water manifold, complete the steps in this procedure.

Procedure

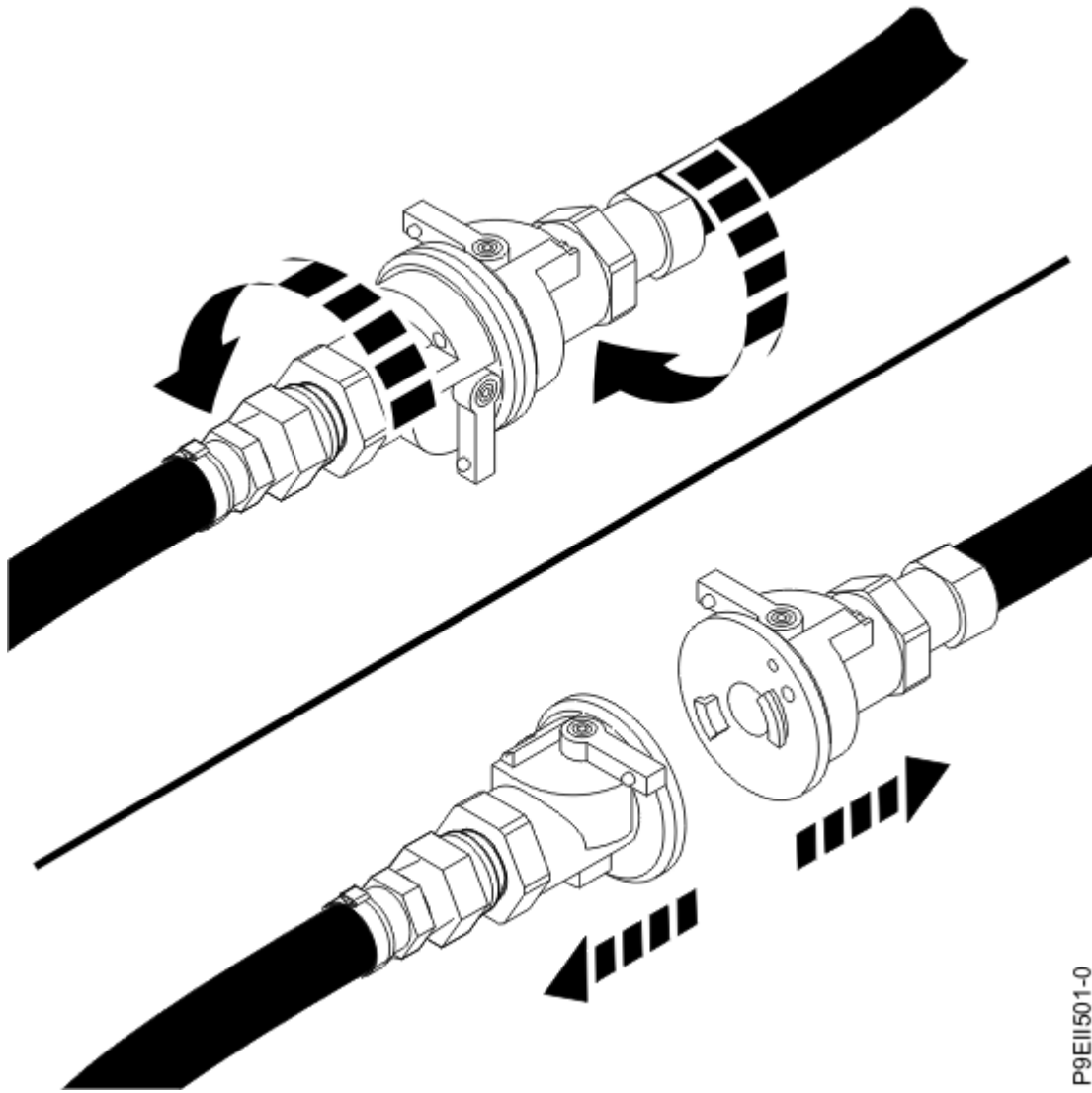
1. To close the valves, rotate the lever of the quick connect ball valve fittings of the manifold hose and the facility water supply hose in the direction that is shown. Press the pin on the valve lever while you rotate it 90 degrees to close it.



P9EII500-0

Figure 180. Closing the manifold and facility water hose valves

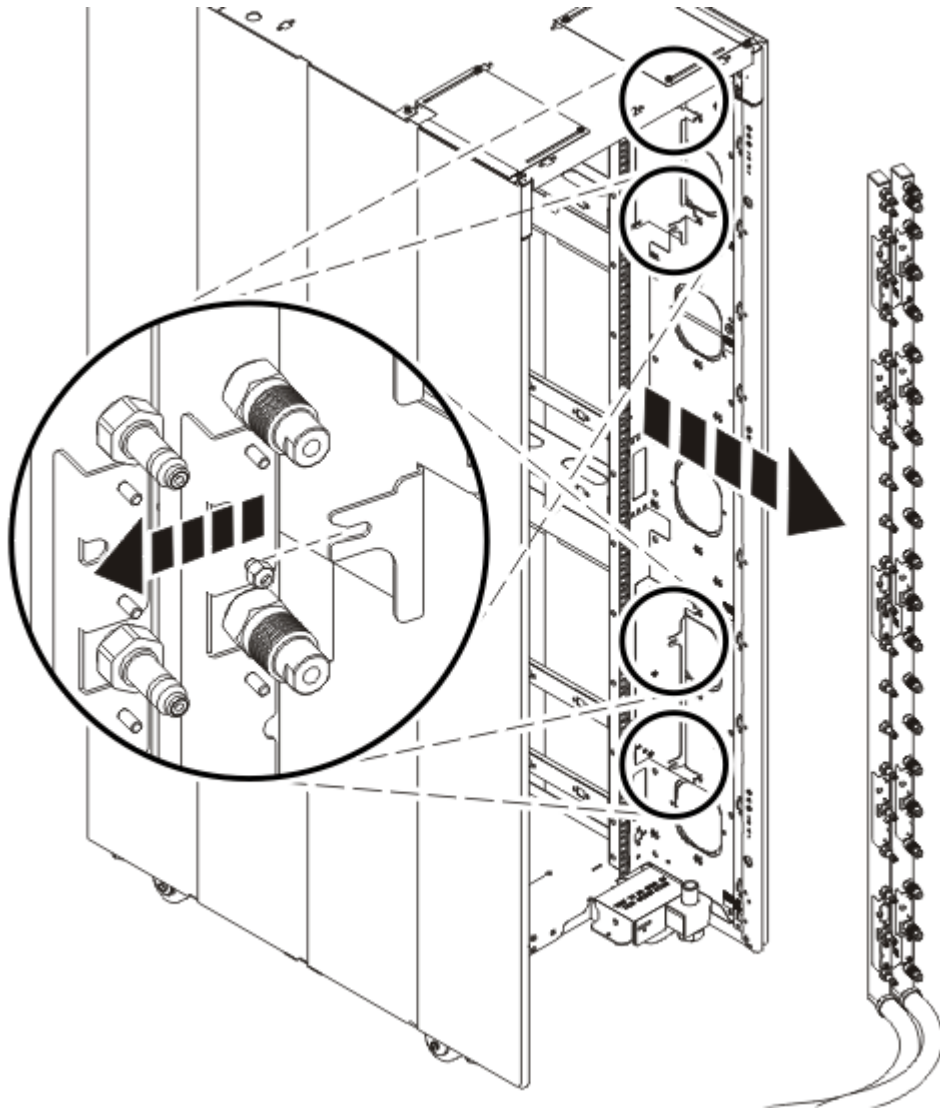
2. Repeat step "1" on page 197 to close the valve of the facility water return hose.
3. Twist the quick connect ball valve fittings on the manifold hose and on the facility water supply hose a quarter-turn in the direction shown. Then, disconnect the hoses.



P9EII501-0

Figure 181. Disconnecting the hoses

4. Repeat step “3” on page 198 to disconnect the facility water return hose.
5. Loosen the four nuts that attach the manifold to the mounting brackets by using a 7 mm nut driver. Then, remove the manifold.



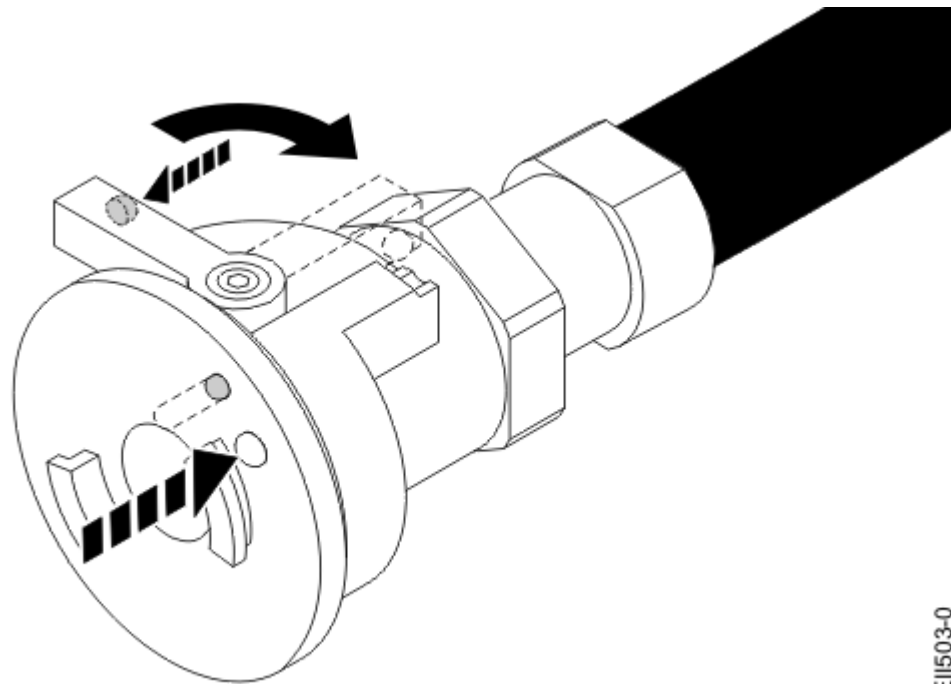
P8EIK687-0

Figure 182. Removing the manifold

6. 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 face 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.



P9EII503-0

Figure 183. Opening the ball valve

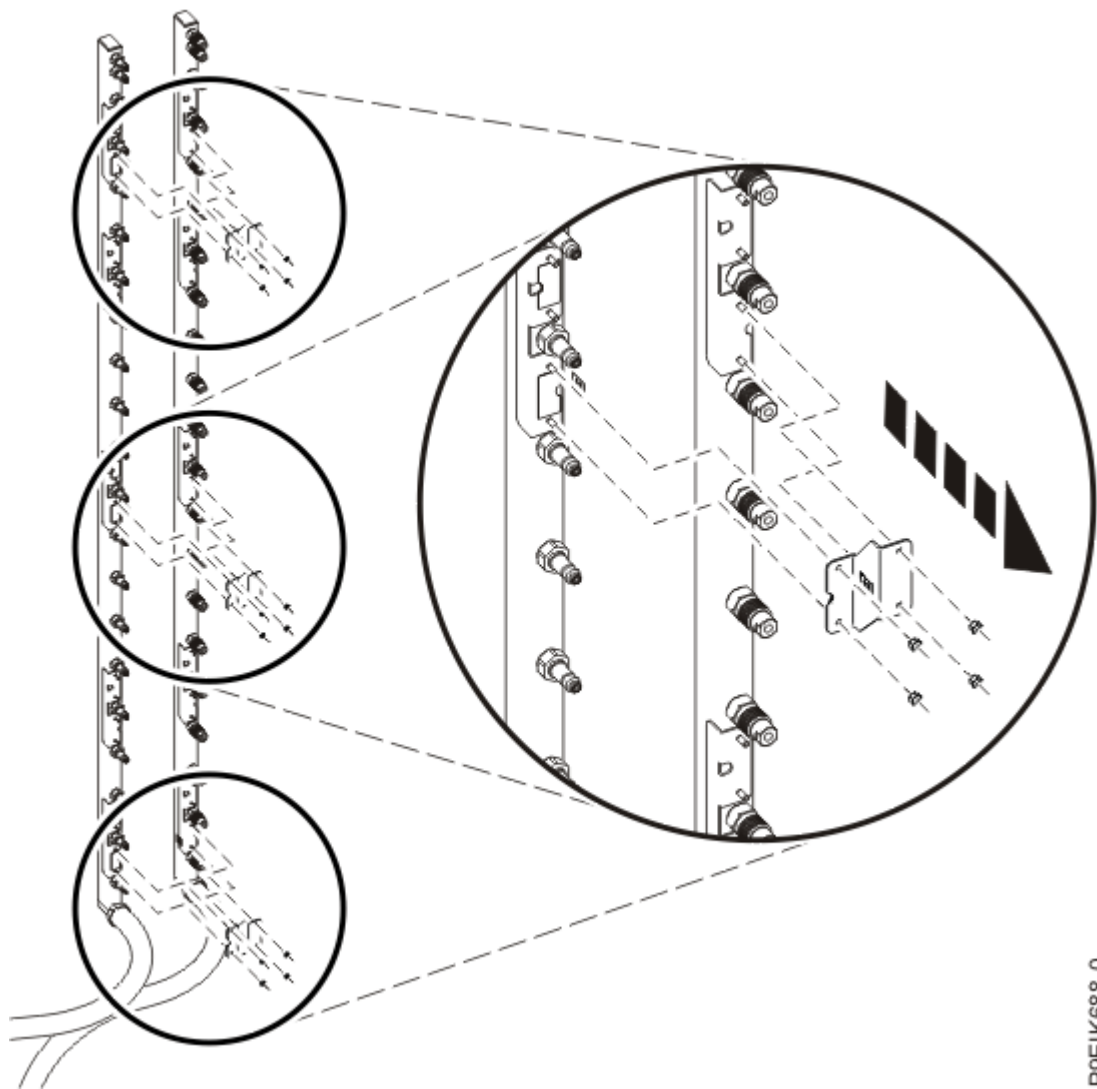
- e) A second person is needed to raise the manifold assembly above the hose and the bucket so that the water can drain from the manifold and the hose into the bucket.
- f) Repeat step “6” on page 200 for the remaining water hose.

Replacing the water manifold in the 8335-GTW or 8335-GTX system

To replace a water manifold, complete the steps in this procedure.

Procedure

1. If the original manifold had the facility supply and return water hoses that exit at the top of the rack, complete this step to reconfigure the replacement manifold. 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.



P9EIK688-0

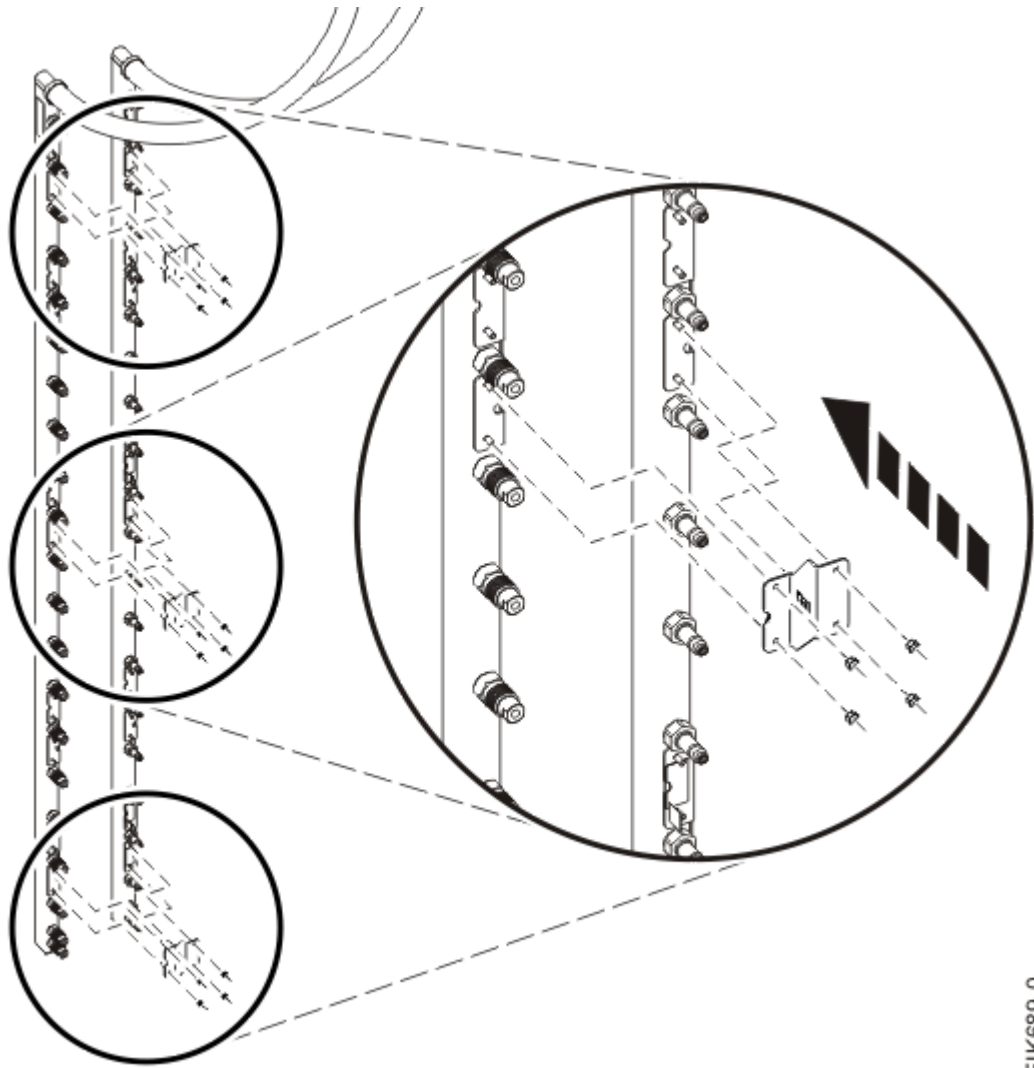
Figure 184. Removing the manifold Z brackets

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.



P9EIK689-0

Figure 185. Installing the manifold z brackets

2. Align the manifold to the mounting bracket slots, then attach the manifold by using a 7 mm nut driver.

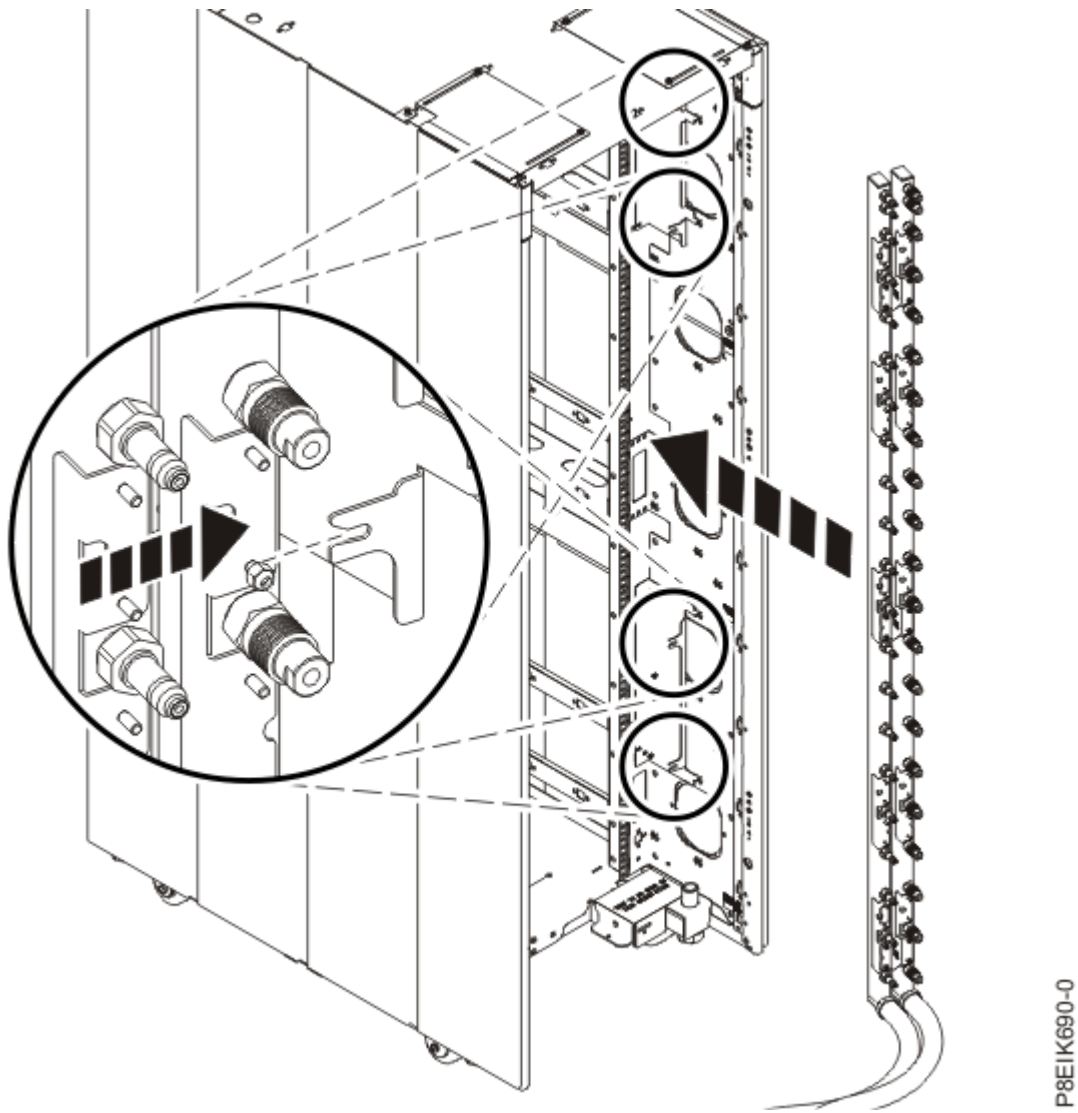
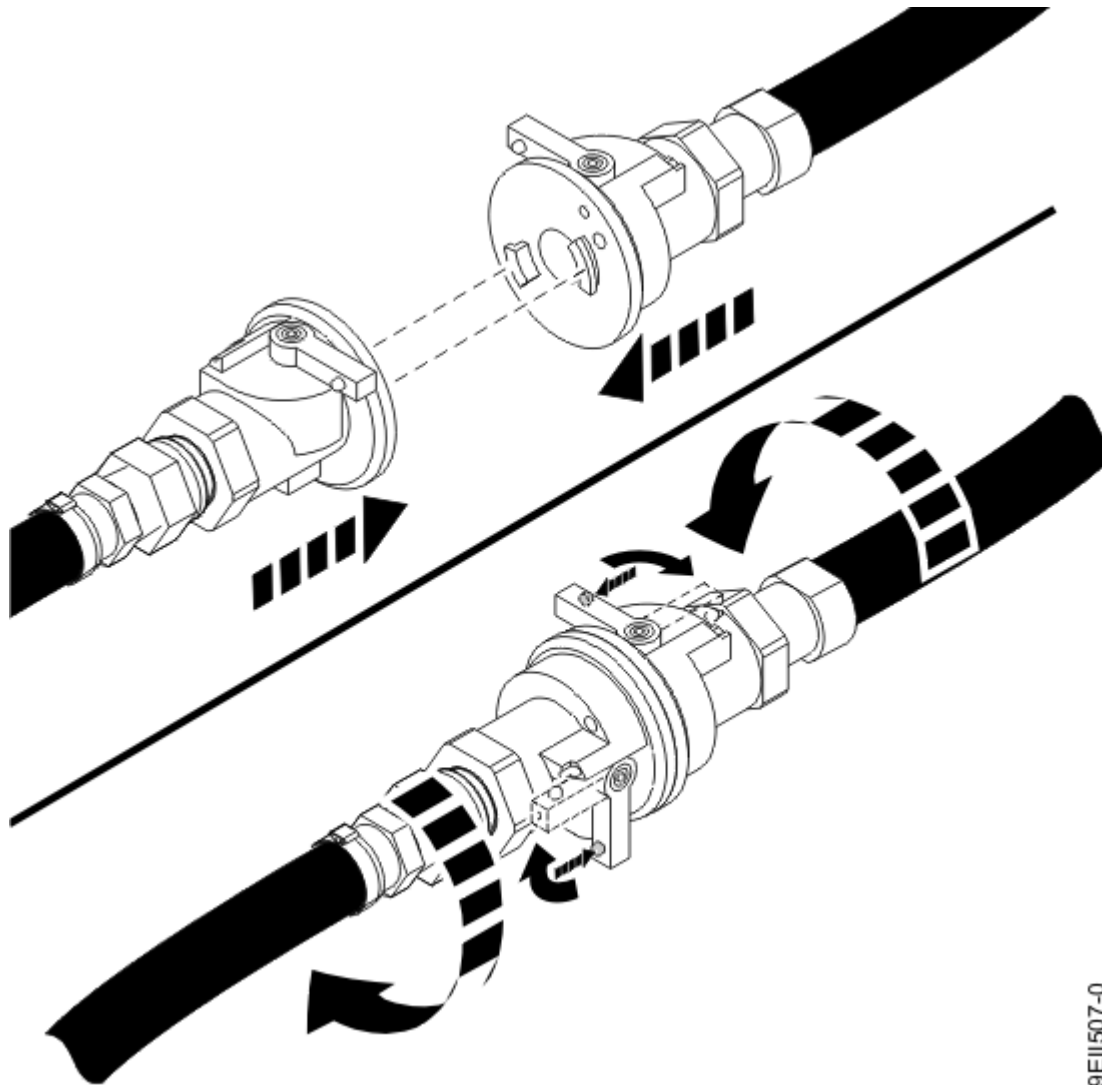


Figure 186. Installing the manifold with the hoses exiting the bottom of the rack

3. 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.



P9E11507-0

Figure 187. Connecting the hoses and opening the valves

4. Repeat step “3” on page 204 to connect the facility water return hose to the manifold hose.

Preparing the 8335-GTW or 8335-GTX system for operation after you remove and replace the water manifold

To prepare the system for operation after removing and replacing a water manifold, complete the steps in this procedure.

Procedure

1. Replace the rack rail on the side of the rack where the manifold is mounted.
2. 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the operating position](#)” on page 229.

3. Using your labels, reconnect the external cables to the system.
4. Reconnect the water hoses at the rear of the rack, as shown in [Figure 188](#) on page 206.

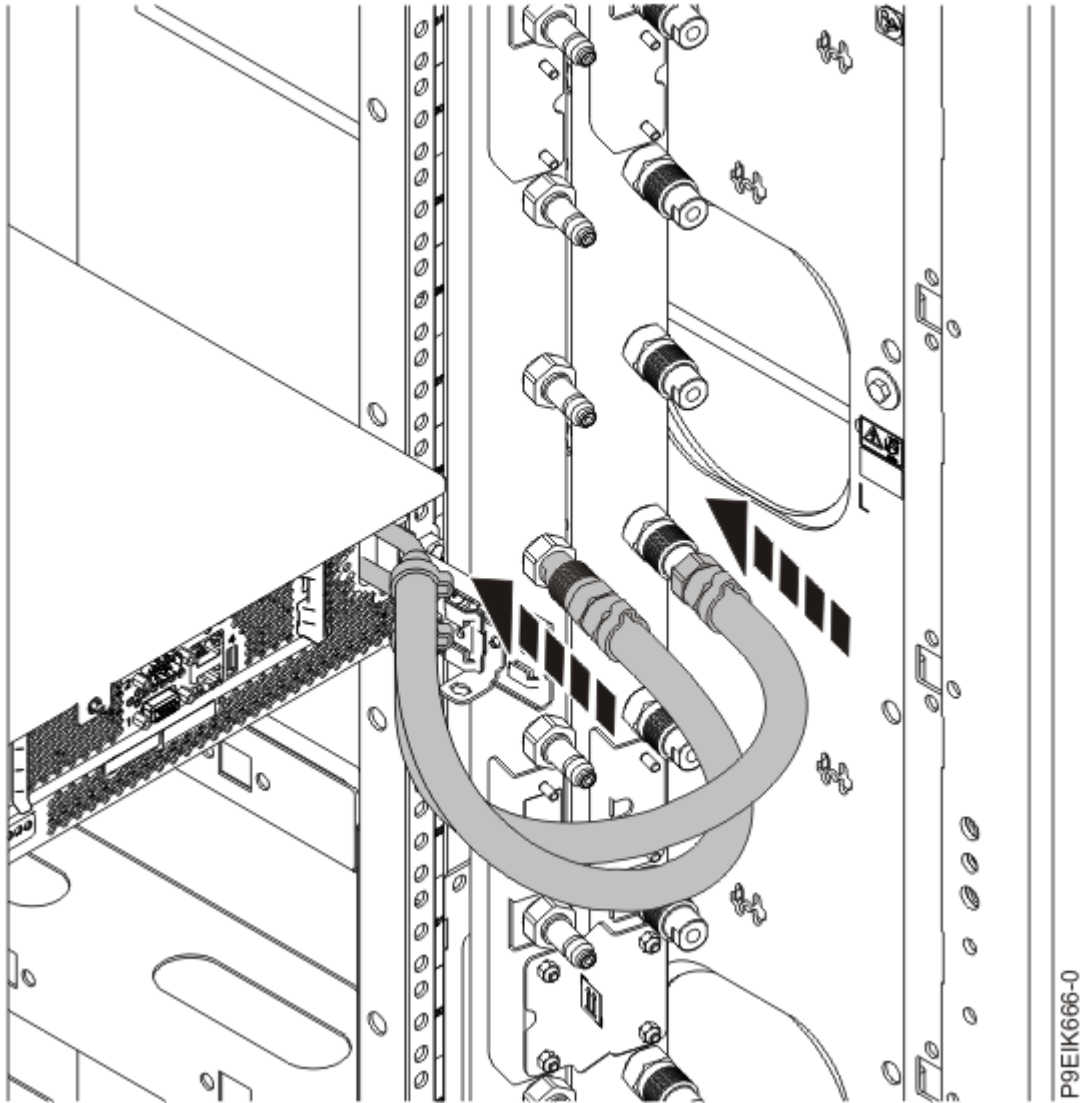


Figure 188. Reconnecting the water hoses

5. Repeat step [“1”](#) on page 205 through step [“4”](#) on page 205 for each system in the rack.
6. Replace the power supplies as shown in [Figure 189](#) on page 207.
 - a) Place your other hand underneath the power supply.
 - b) Align the power supply **(A)** with the bay with the fan to the left.
 - c) Slide the power supply into the system until the latch **(B)** locks in place.
 - d) Repeat steps [“6.a”](#) on page 206 - [“6.c”](#) on page 206 for the other power supply.

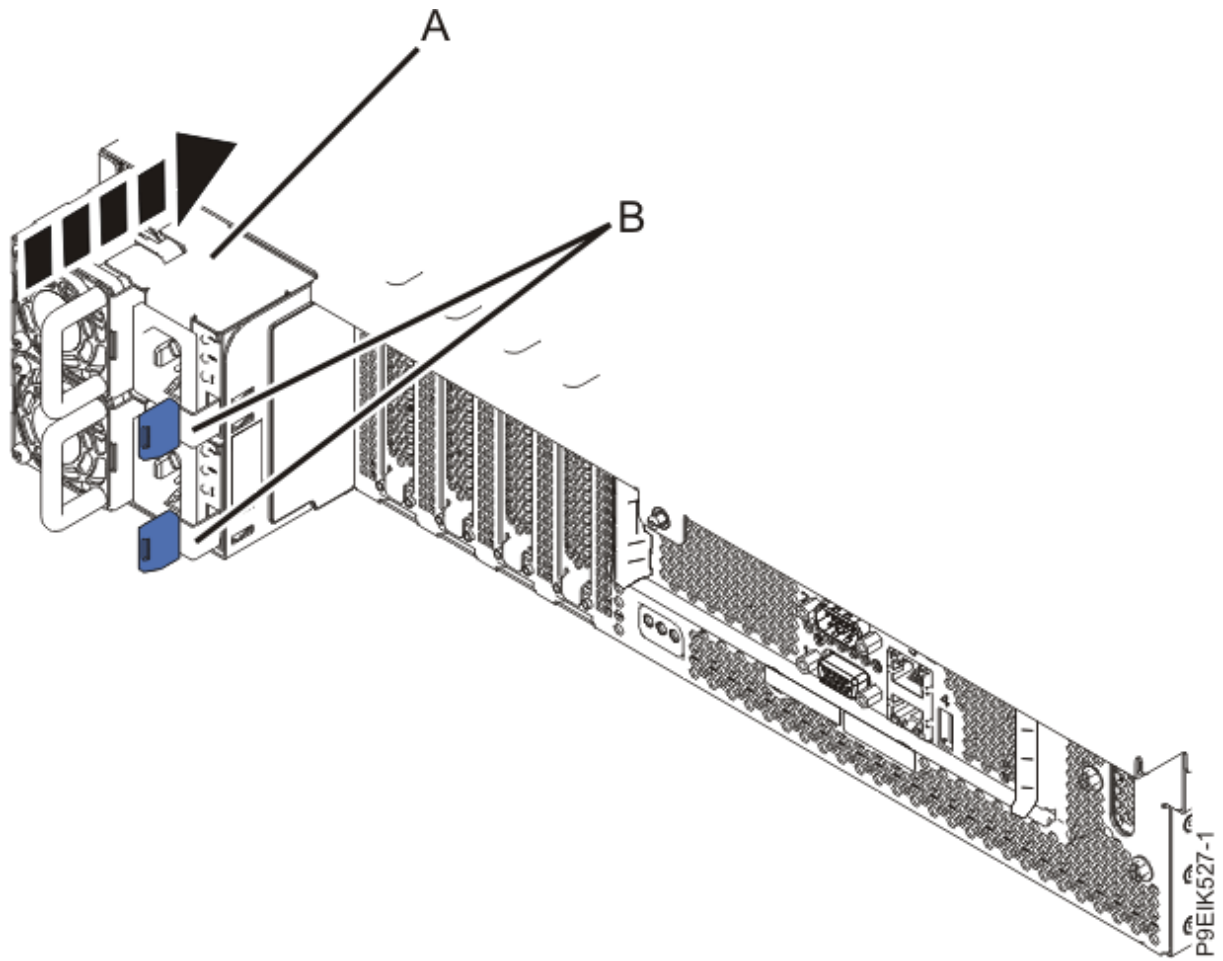


Figure 189. Replacing the power supplies in the system

7. Reconnect the power cords to the power supplies.

For instructions, see [“Connecting power cords to an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 235.

8. Repeat steps “6” on page 206 - “7” on page 207 for all the systems in the rack.

9. Start the system. For instructions, see [“Starting the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system ”](#) on page 222.

10. Repeat step “9” on page 207 for all the systems in the rack.

11. Verify the installed part.

See [Verifying a repair \(www.ibm.com/support/knowledgecenter/POWER9/p9ei3/p9ei3_verifyrepair.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9ei3/p9ei3_verifyrepair.htm).

Common procedures for servicing or installing features in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn about the common procedures related to installing, removing, and replacing features in the 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.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. 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.
- 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 if provided, unless the earthquake option is to be installed.
- 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).



- Stability hazard:
 - The rack may tip over causing serious personal injury.
 - Before extending the rack to the installation position, read the installation instructions.
 - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
 - Do not leave the slide-rail mounted equipment in the installation position.
- 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 1 of 2)

(R001 part 2 of 2):



CAUTION:

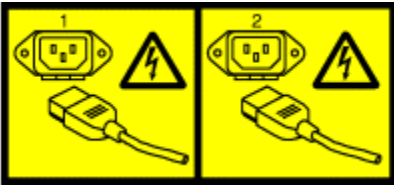
- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, 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 or if the rack is not bolted to the floor. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)

(L003)



or



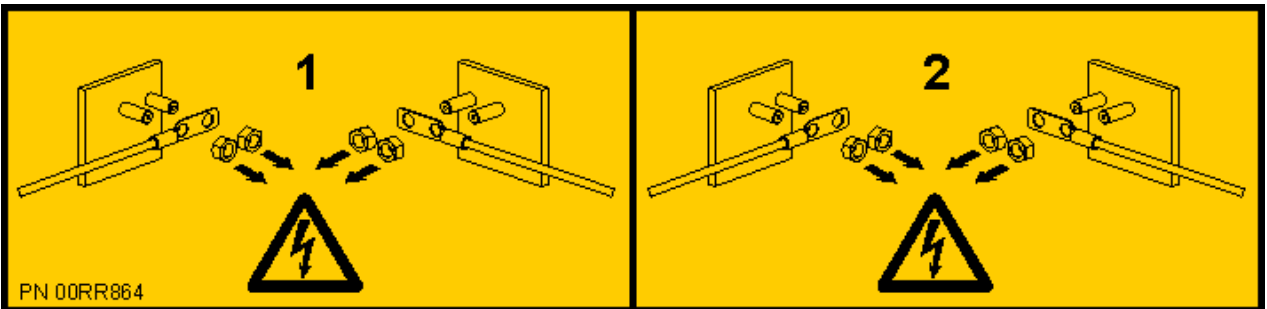
or




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 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.

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, see the [Directory of worldwide contacts](http://www.ibm.com/planetwide) (<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 AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) 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 need to use a troubleshooting program such as `impi tool` to identify the issue.

LEDs on the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Use this information as a guide to the LEDs on the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

The LEDs indicate various system statuses. These LEDs are at the front (as shown in [Figure 190 on page 214](#) and [Figure 191 on page 214](#)) and at the rear of the system (as shown in [Figure 192 on page 215](#)).

- 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 blue LED is used to identify the system that requires service.
- The amber LED indicates a problem in the system. After a part is repaired, the amber LED takes a minute to turn off.

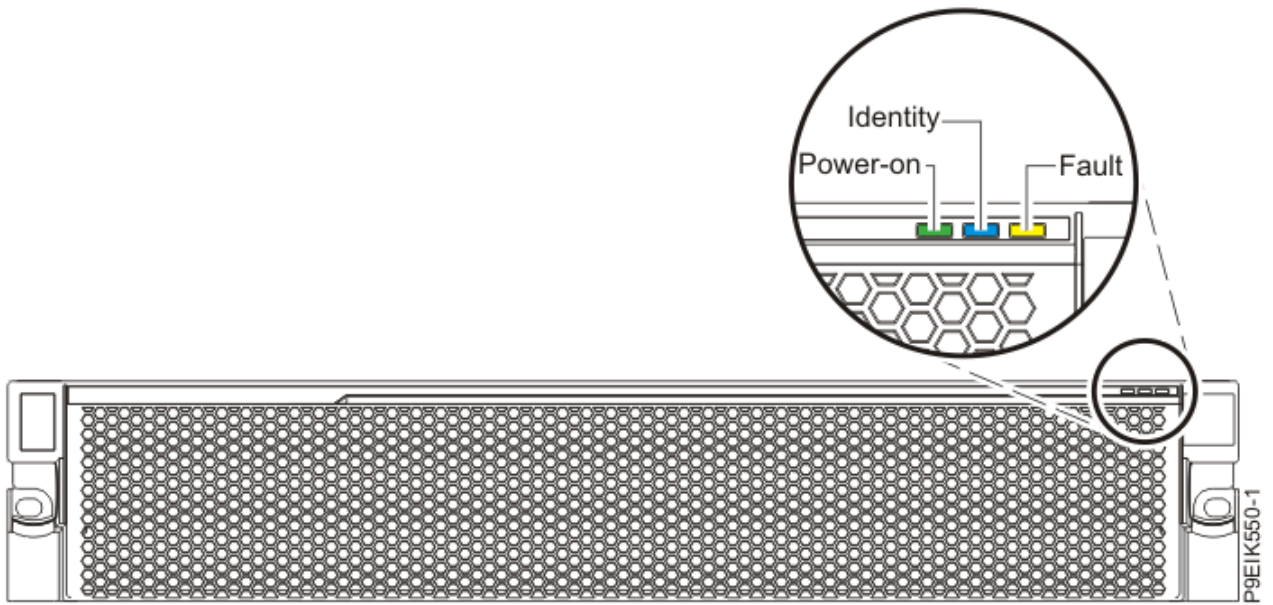


Figure 190. Front LEDs with bezel on

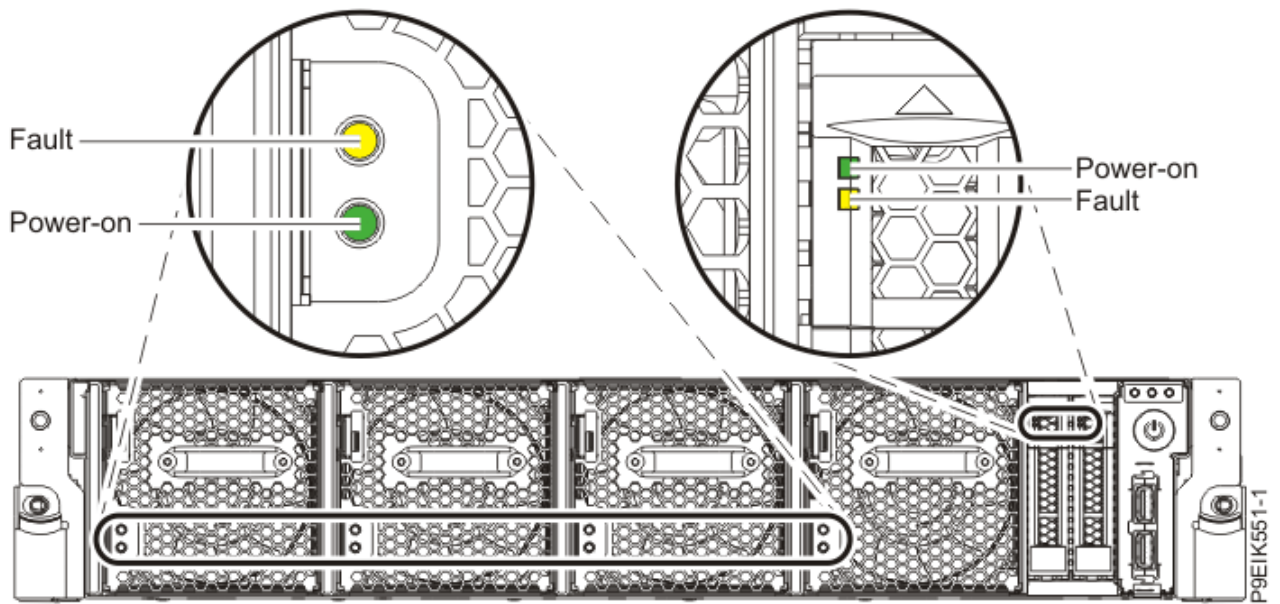


Figure 191. Front LEDs with bezel off

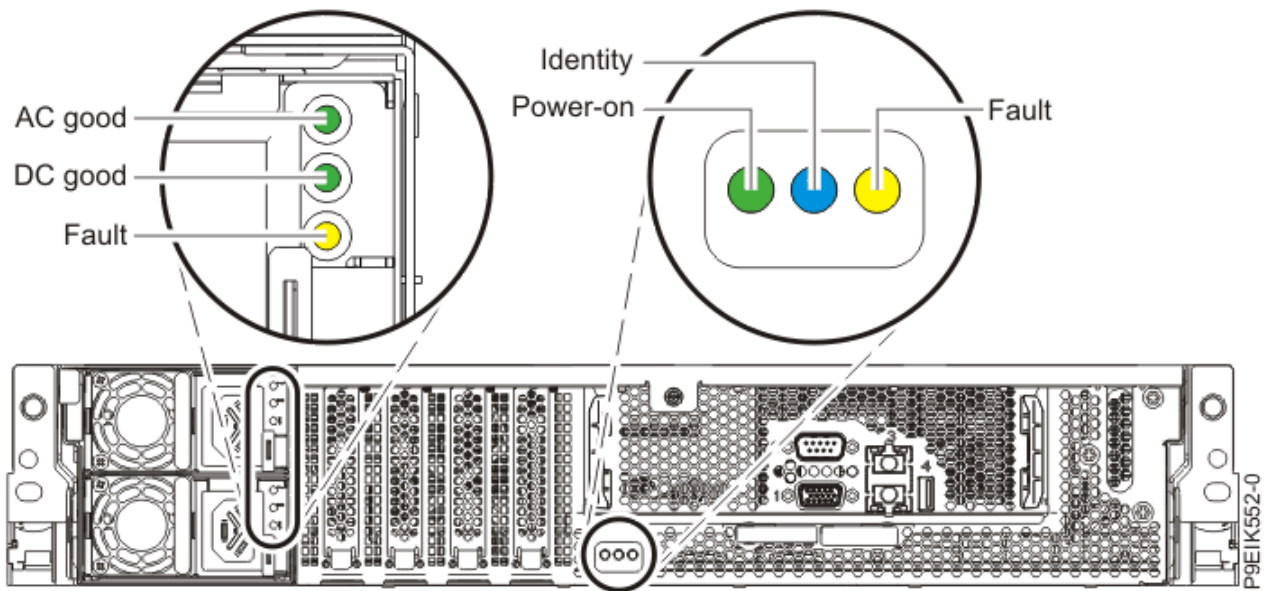


Figure 192. Rear LEDs

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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system that needs servicing

Learn how to turn on the blue identify LED to help you find the system that needs servicing.

Procedure

To activate the blue system identify LED, use the following command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> chassis identify on
```

To turn off the blue system identify LED, use the following command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> chassis identify off
```

To check the status of the blue system identify LED, use the following command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> chassis identify status
```

Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts

To prepare the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) 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 209.
2. Identify the part and the system that you need to work on. For instructions, see [“Identifying the system that contains the part to replace”](#) on page 213.
3. If applicable, open the rack front door.
4. Attach the electrostatic discharge (ESD) wrist strap.

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.
5. Remove the front cover. For instructions, see [“Removing the front cover from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 226.

(L007)

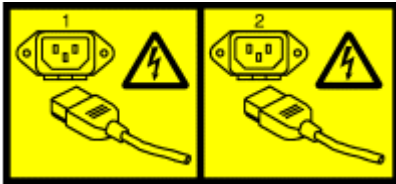


CAUTION: A hot surface nearby. (L007)

6. Stop the system. For instructions, see [“Stopping the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 223.
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 power cords from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 232.

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

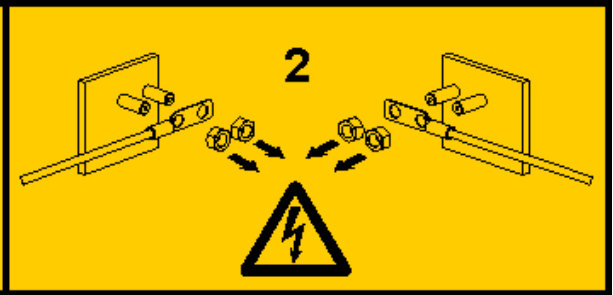
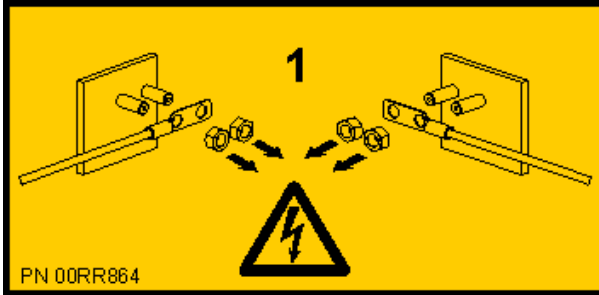


or



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 power supplies from the system as shown in [Figure 193](#) on page 219.

- a) To release a power supply from its position in the system, pull the locking-tab **(A)** to the left.
- b) Grasp the power supply handle with one hand, and pull the power supply **(B)** partially 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.
- d) Repeat steps “9.a” on page 218 - “9.c” on page 218 for the other power supply.

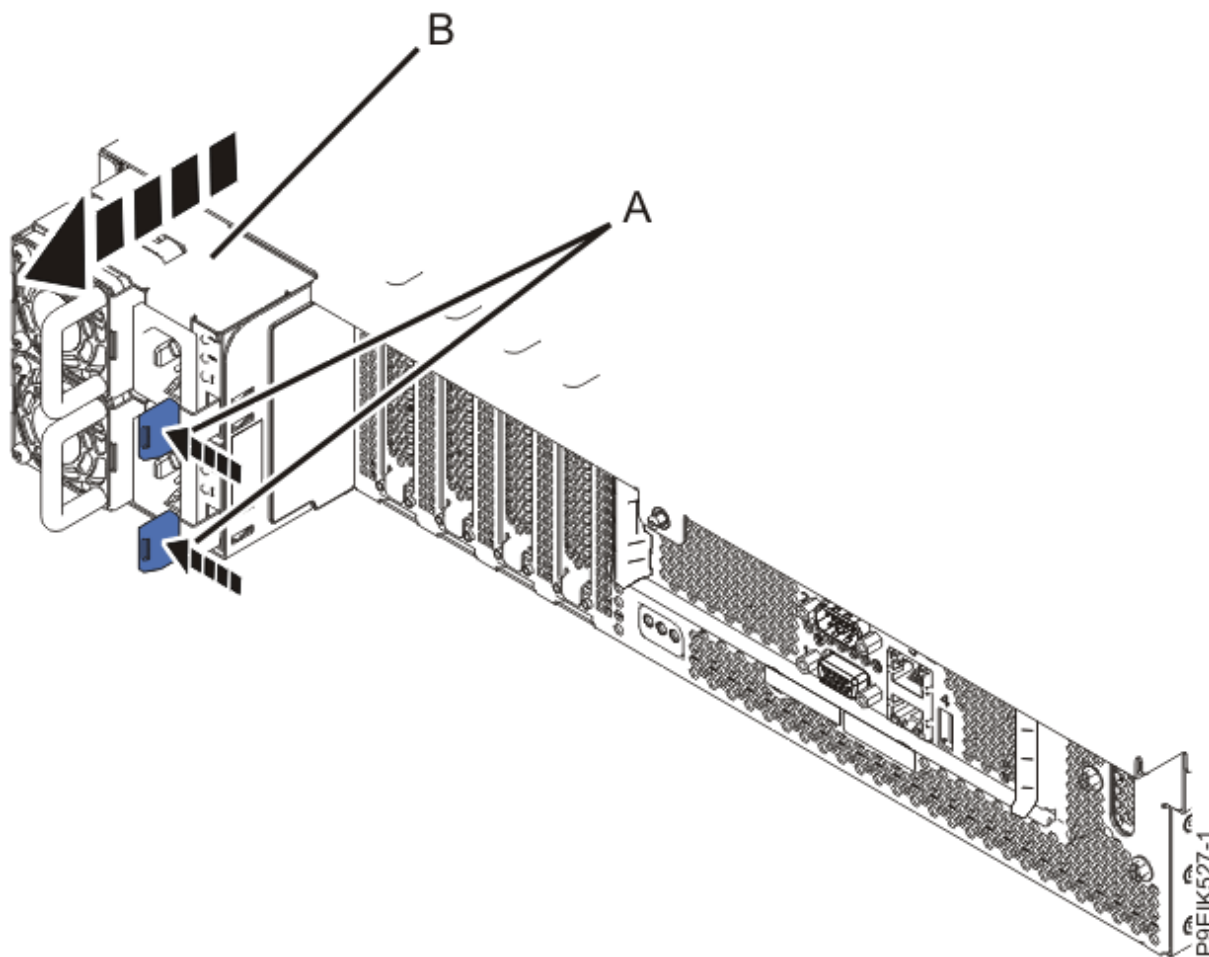



Figure 193. Removing the power supplies from the system

- Place the system into the service position. For instructions, see [“Placing an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the service position”](#) on page 227.

 **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)

- Remove the service access cover. For instructions, see [“Removing the service access cover from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 224.

Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts

To prepare the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) 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 on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Replace the service access cover. For instructions, see [“Installing the service access cover on an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 225.
3. Place the system into the operating position. For instructions, see [“Placing an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the operating position”](#) on page 229.

(L012)



CAUTION: Pinch hazard. (L012)



Attention: For a water-cooled system, before you power on the system, ensure that cooling water is circulating through the system.

4. Replace the power supplies as shown in [Figure 194 on page 221](#).
 - a) Place your other hand underneath the power supply.
 - b) Align the power supply **(A)** with the bay with the fan to the left.
 - c) Slide the power supply into the system until the latch **(B)** locks in place.
 - d) Repeat steps [“4.a” on page 220](#) - [“4.c” on page 220](#) for the other power supply.

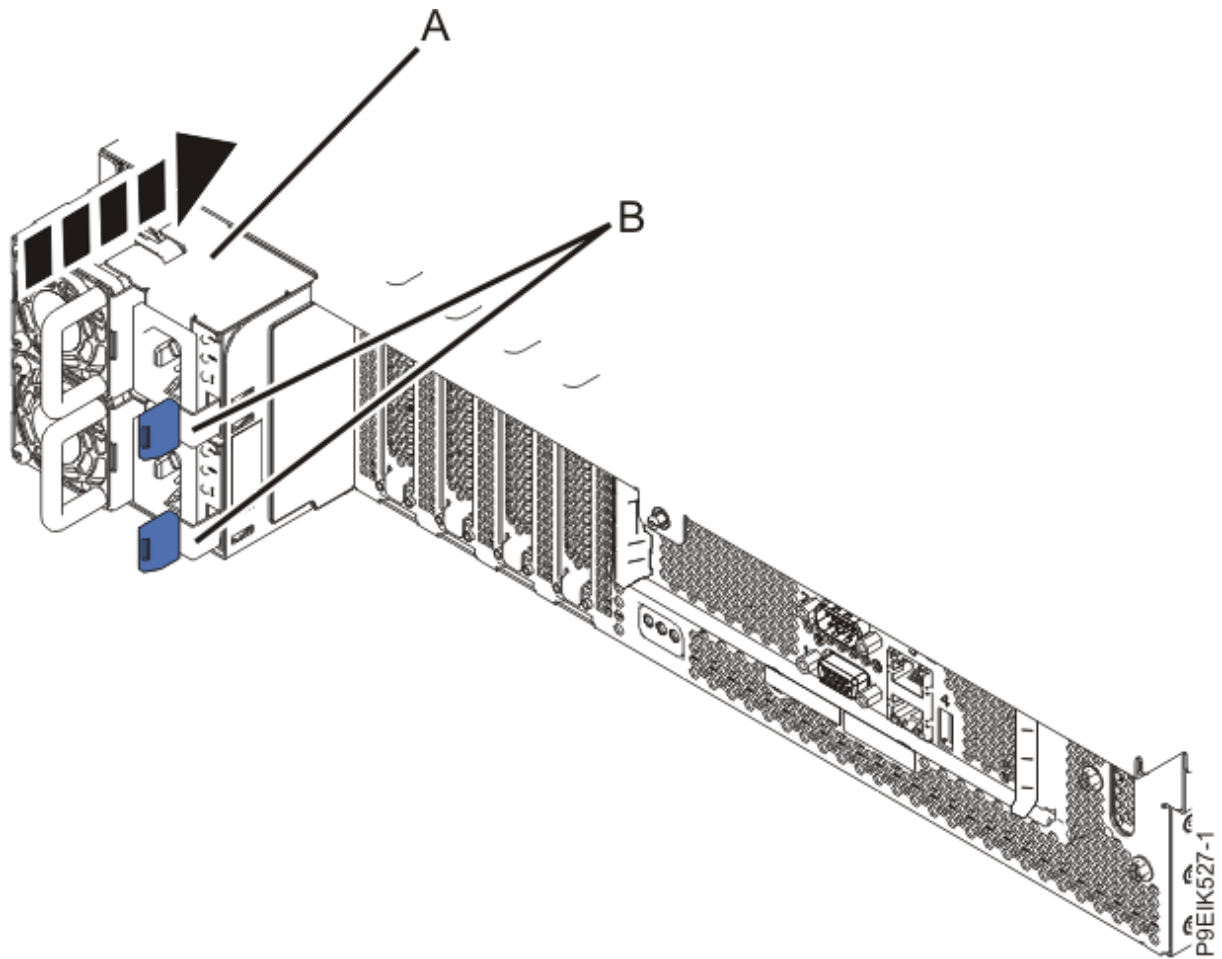


Figure 194. Replacing the power supplies in the system

5. Reconnect the power cords to the power supplies.

For instructions, see [“Connecting power cords to an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 235.

6. If applicable, close the rack door at the rear of the system.

7. Start the system. For instructions, see [“Starting the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system”](#) on page 222.

8. If the BMC card was replaced continue to the next step, otherwise go to step [“12”](#) on page 222.

9. Configure the BMC IP address.

For instructions, see [Configuring the BMC IP address](#) (www.ibm.com/support/knowledgecenter/POWER9/p9eih/p9eih_configuring_bmc_ip.htm).

10. Enter the network settings that you recorded earlier.

For instructions, see [Network settings](#) (www.ibm.com/support/knowledgecenter/POWER9/p9eih/p9eih_openbmc_networksetting.htm).

11. Complete the following steps to ensure that **fieldmode** is set to **true**:

- a. Logon to the BMC by using Secure Socket Shell (SSH).
- b. Run the following command:

```
fw_printenv fieldmode
```

- c. Is the output of the command **fieldmode=true**?

- **Yes:** Continue with step [“12”](#) on page 222.
- **No:** Continue with step [“11.d”](#) on page 222.

d. Run the following command:

```
fw_setenv fieldmode true
```

12. Replace the front cover. For instructions, see “[Installing the front cover on an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system](#)” on page 227.

13. If applicable, close the rack front door.

14. Verify the installed part.

See [Verifying a repair \(www.ibm.com/support/knowledgecenter/POWER9/p9ei3/p9ei3_verifyrepair.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9ei3/p9ei3_verifyrepair.htm).

Starting and stopping the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn how to start and stop the IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system to perform a service action or system upgrade operation.

Starting the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

You use the power button to start the system.

About this task



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



Attention: For a water-cooled system, before you power 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 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 195 on page 223](#), is flashing. A flashing light indicates standby power to the unit.

3. Press the power button that is shown in [Figure 195 on page 223](#).

The power-on light stops flashing and remains on, indicating that the system power is on. The system cooling fans first run at a high speed, and after approximately 30 seconds, return to operating speed.

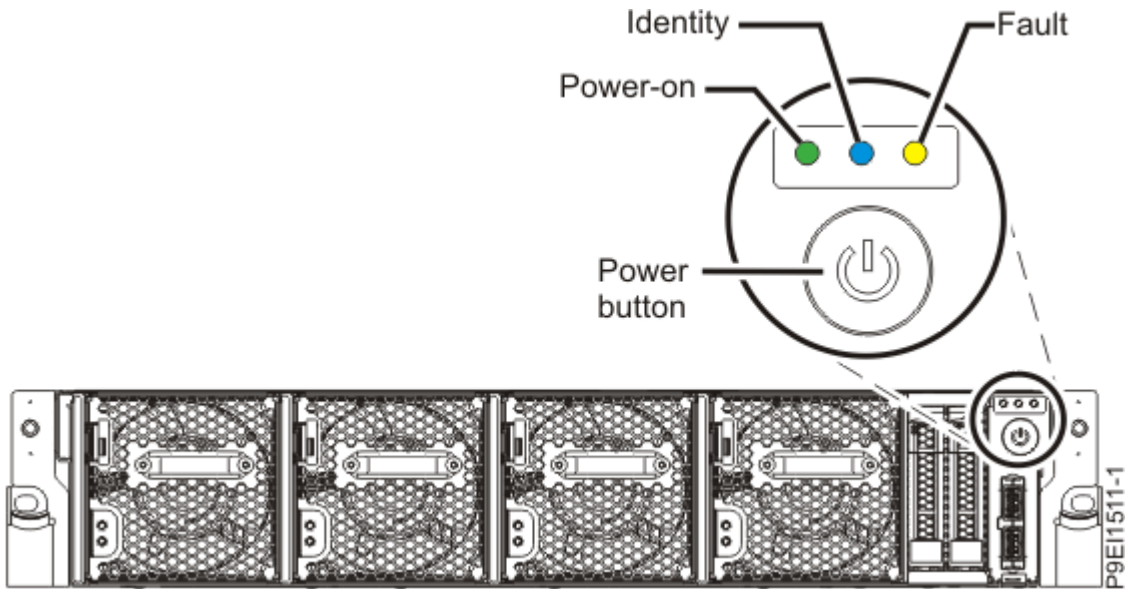


Figure 195. Power button

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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

You can use the power button or a command to stop the system.

Procedure

- You can press and hold the power button to stop and power off the system.

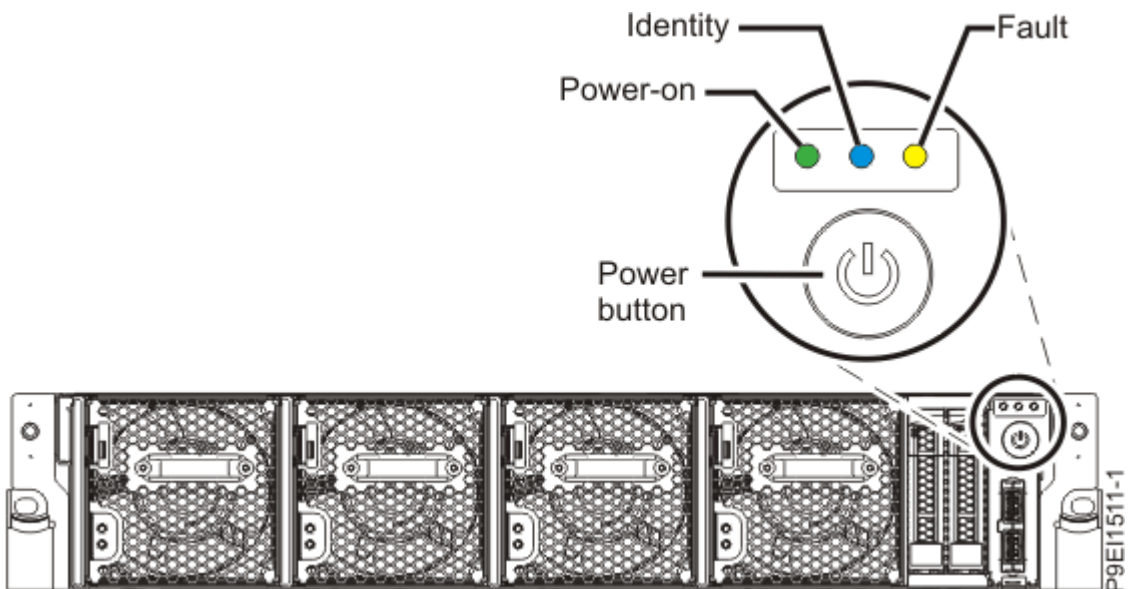


Figure 196. Power button

- You can use the Linux[®] **shutdown** command to stop and power off the system.

For example, the following command shuts down the system in 10 minutes and sends the message "Repairs coming" to the users.

```
shutdown -P +10 "Repairs coming"
```

The `-P` setting instructs the system to shut down and then power off. The `+` indicates the time in minutes before the shutdown occurs.

Sensor status

You can check the sensor status to quickly determine the general health of the system without using the event codes.

To view the sensor status, use the following command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> fru status
```

To view the sensor status and any corresponding event codes, use the following command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> fru status -v
```

Sensors that have a status of **present** and **functional** do not require a service action. Sensors that have a status of **present** and **not functional** require a service action.

Some occurrences of errors in the system might not appear in the sensor status. After you view the sensor status, look for event codes to determine whether a service action is required.

Removing and replacing covers on an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn how to remove and replace the covers for an IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system so that you can access the hardware parts or service the system.

Removing the service access cover from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove the service access cover, complete the steps in this procedure.

Procedure

1. Ensure that you removed both power supplies from the system.

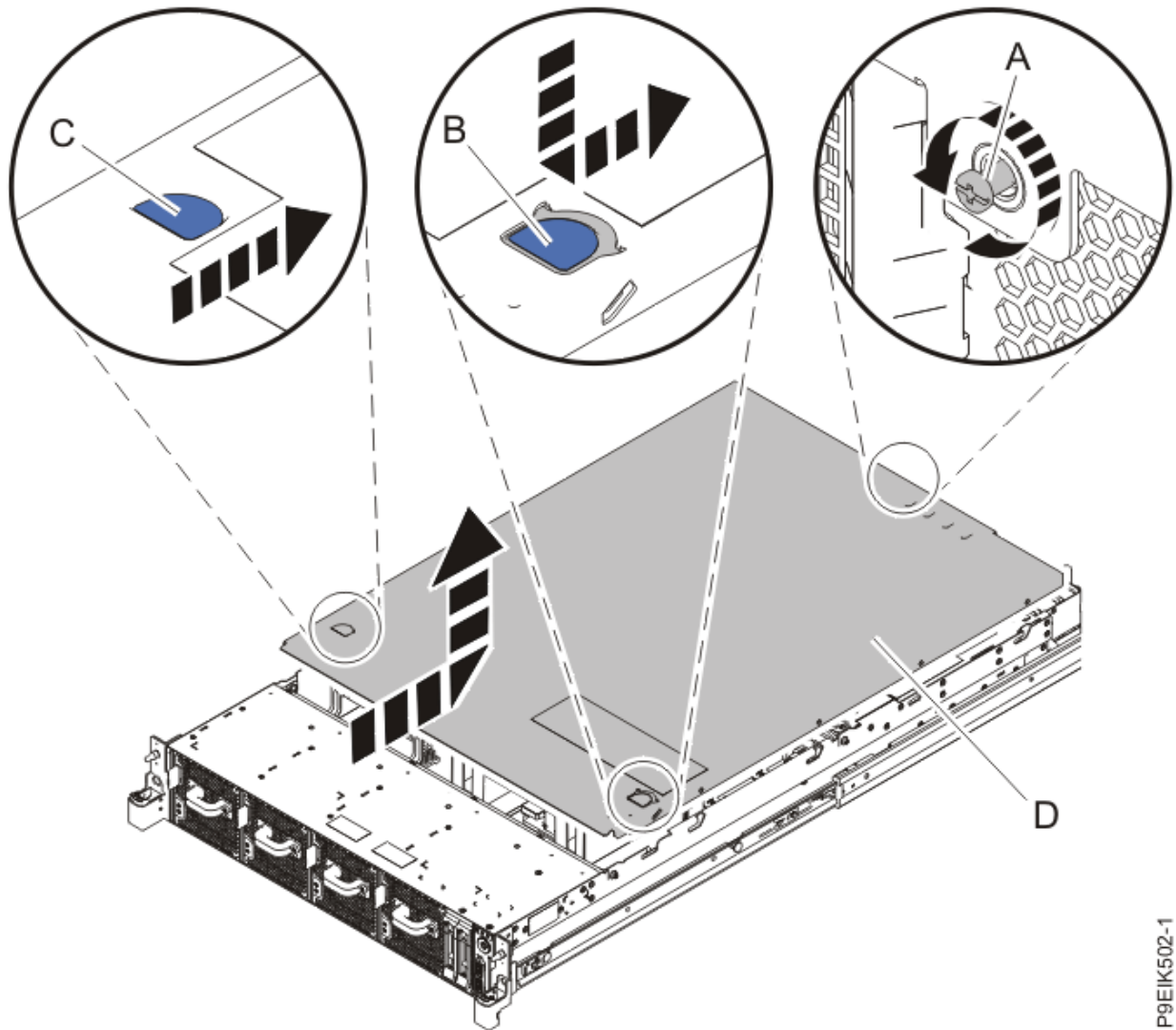
For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

(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.



P9EIK502-1

Figure 197. Removing the cover

3. While you press 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace the service access cover, complete the steps in this procedure.

About this task



Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before powering on 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 198](#) on page 226.

2. Fasten the cover screw (C) at the rear of the cover.

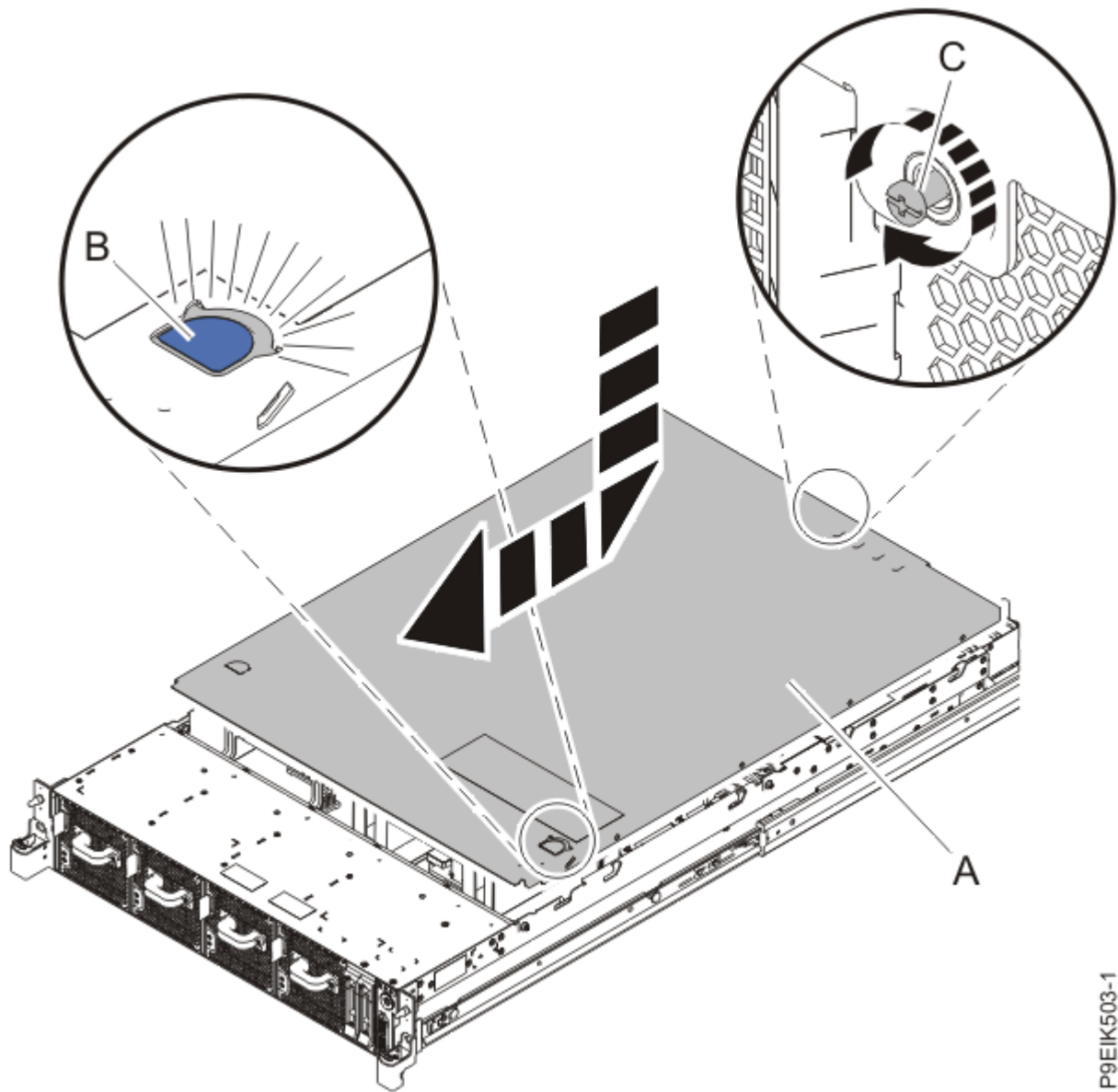


Figure 198. Installing the cover

P9EIK503-1

Removing the front cover from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To remove the front cover, complete the steps in this procedure.

Procedure

1. If necessary, open the front rack door.
2. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so 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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To replace the front cover, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so 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 the cover is firmly seated 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 the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Learn how to place on an IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system into the service or operating position.

Placing an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the service position

To place a system into the service position, complete the steps in this procedure.

About this task

Pick the proper type of rails for your system:

- [“Slide rails” on page 227](#)
- [“Fixed rails” on page 228](#)

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.

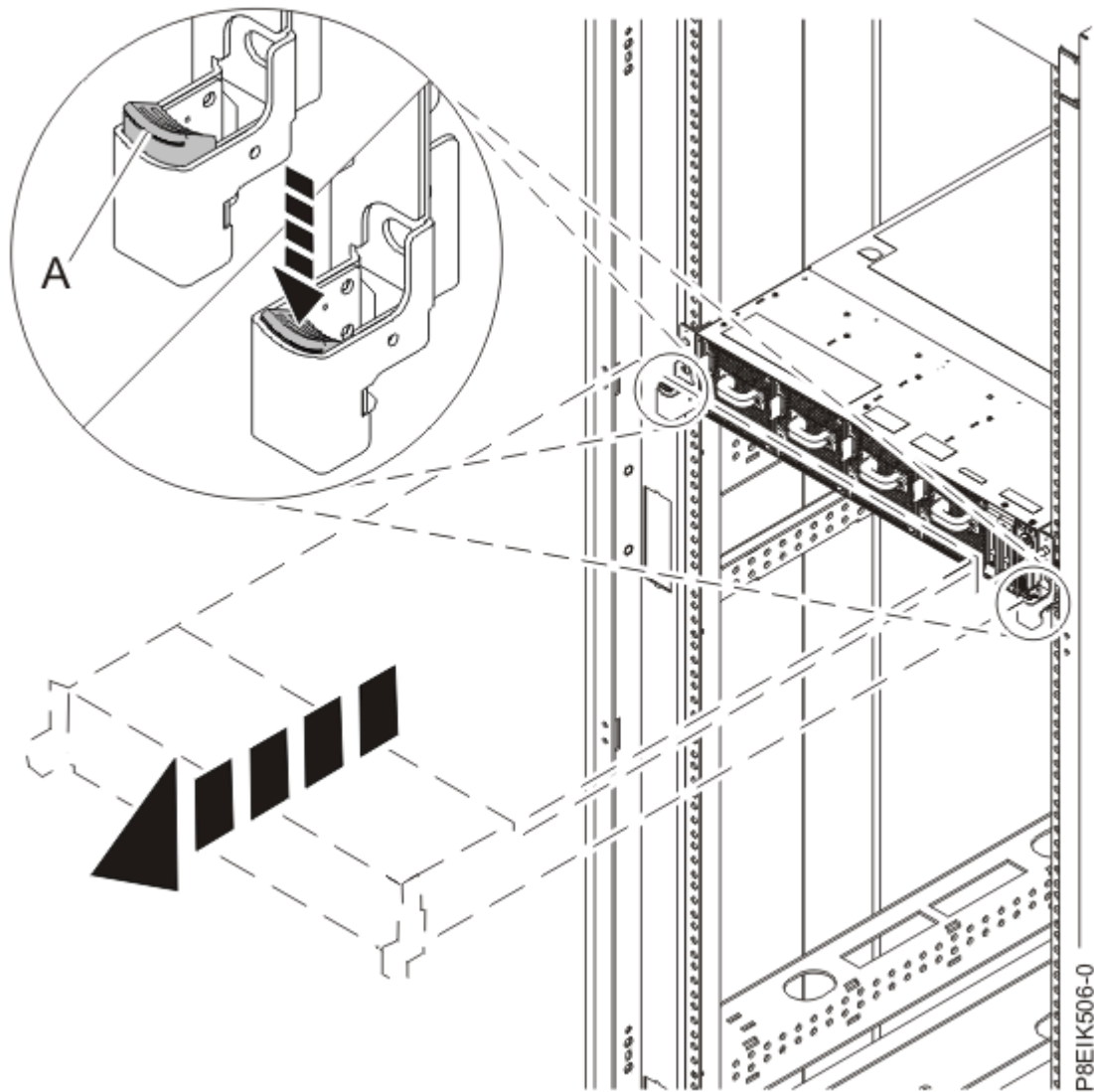


Figure 199. Placing the system into the service position

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 200 on page 229](#).

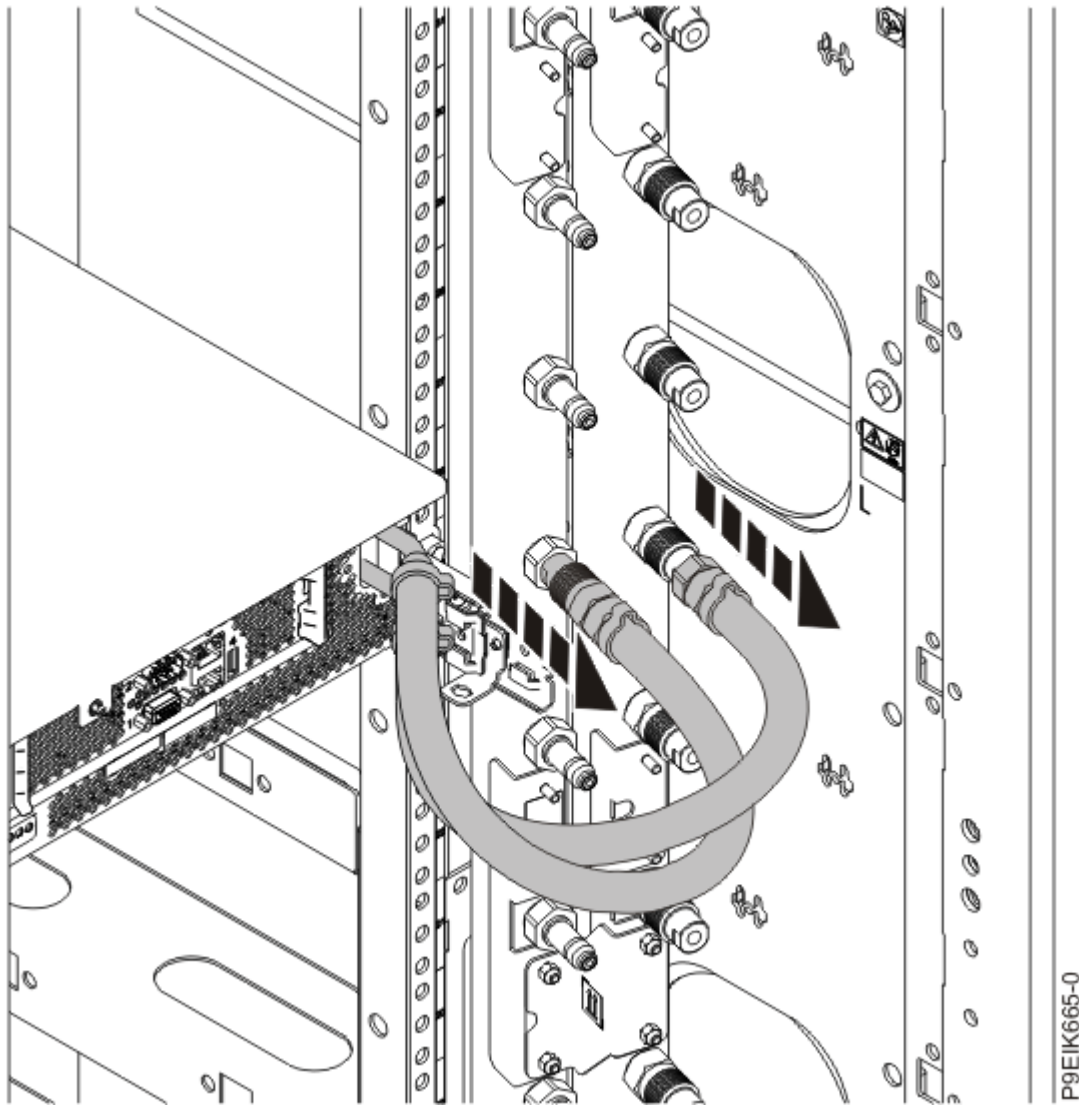


Figure 200. Disconnecting the water hoses

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-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system into the operating position

To place a system into the operating position, complete the steps in this procedure.

About this task

Pick the proper type of rails for your system:

- [“Slide rails” on page 230](#)
- [“Fixed rails” on page 231](#)

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 201 on page 230](#).

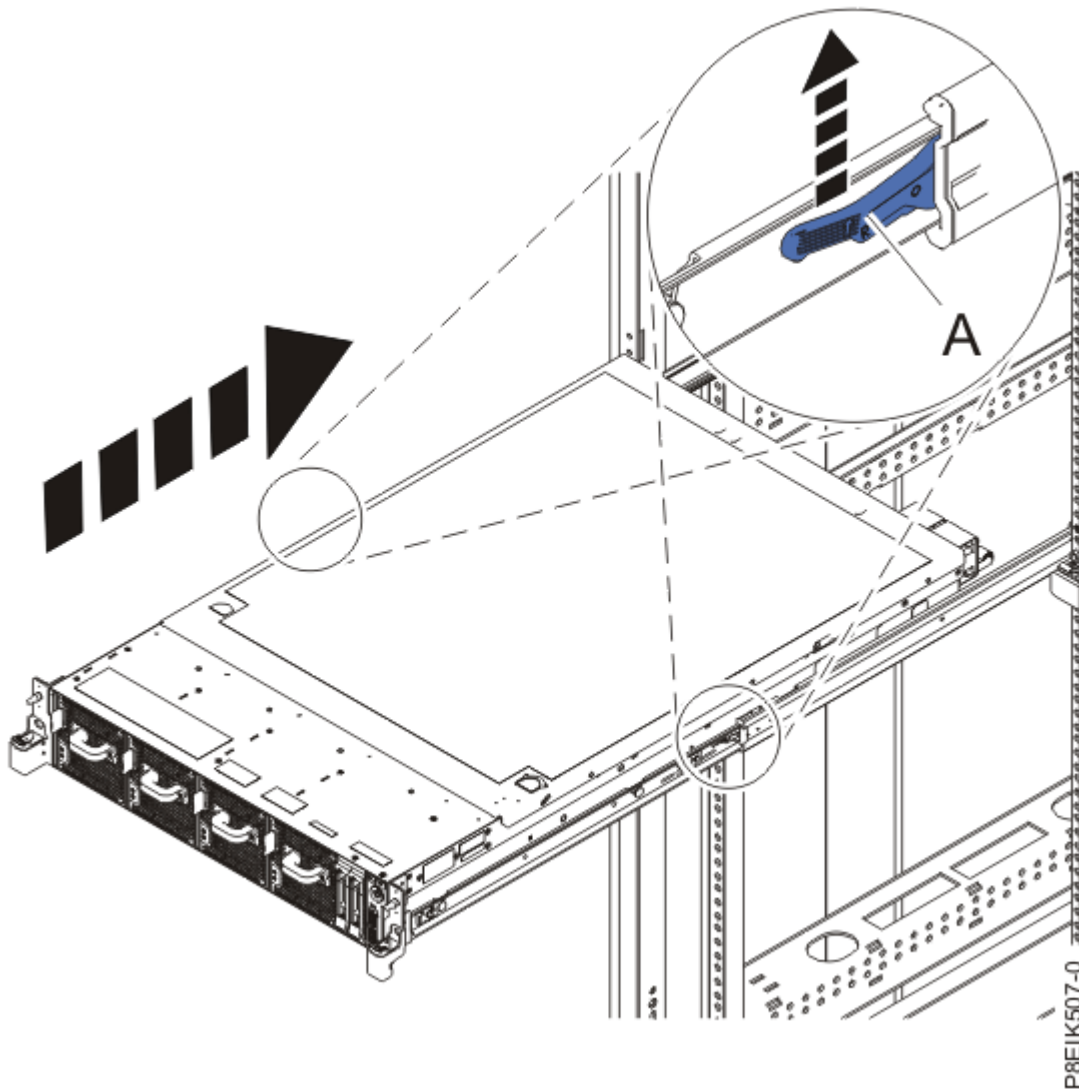


Figure 201. Placing the system into the operating position

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 the following figure.

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.

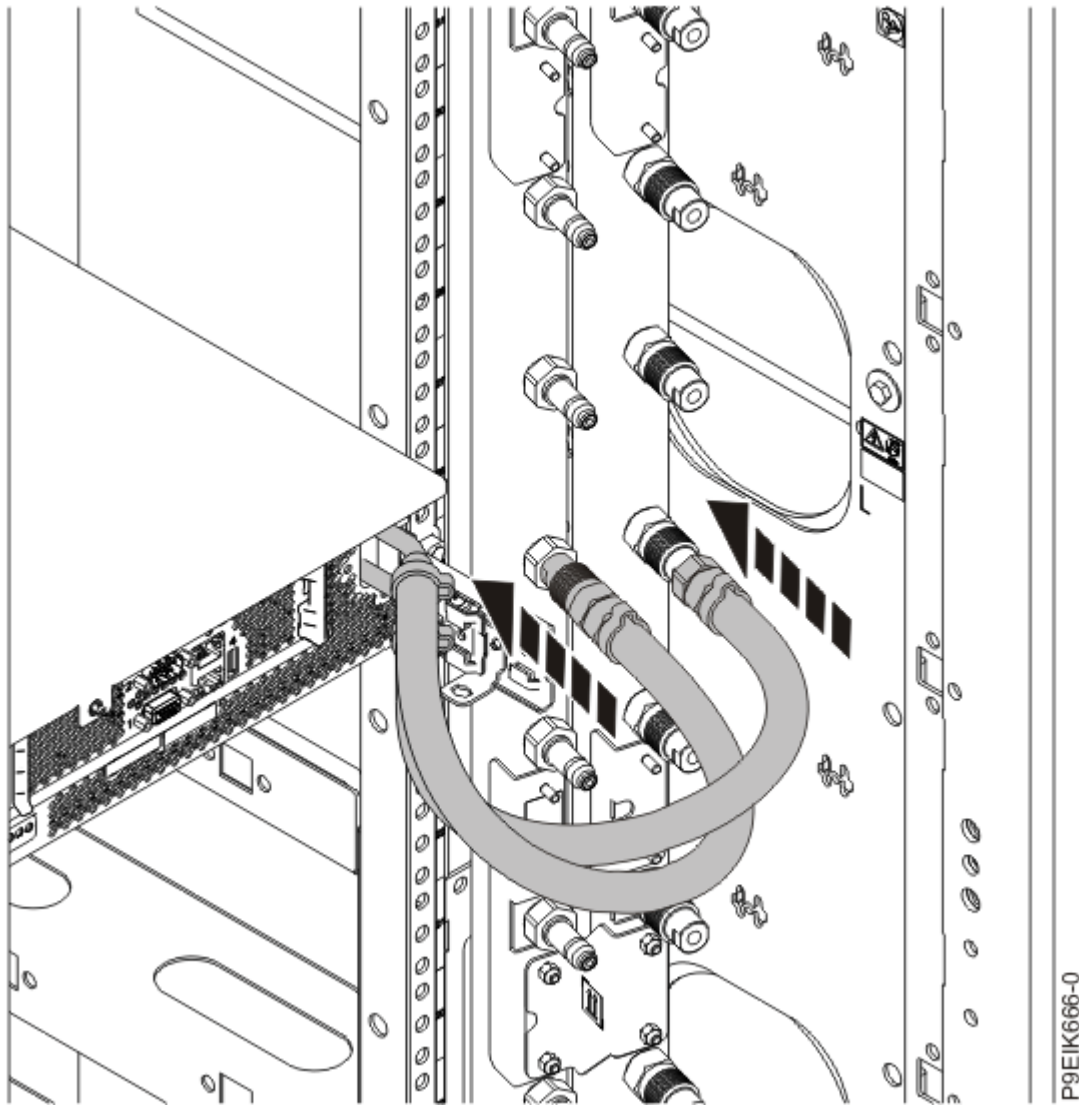


Figure 202. Connecting the water hoses

8. Replace the screws on either side of the system that secure the system to the rack.

Removing and replacing power cords in the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

Find information about removing and replacing power cords in an IBM Power System AC922 (8335-GTC, 8335-GTG, and 8335-GTH) or IBM Power System AC922 (8335-GTW and 8335-GTX) system.

Disconnecting power cords from an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To disconnect a power cord, complete the steps in this procedure.

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 need to make that same loop when you reattach the power cords. Figure 203 on page 233 and Figure 204 on page 234 shows how to loop the cables.

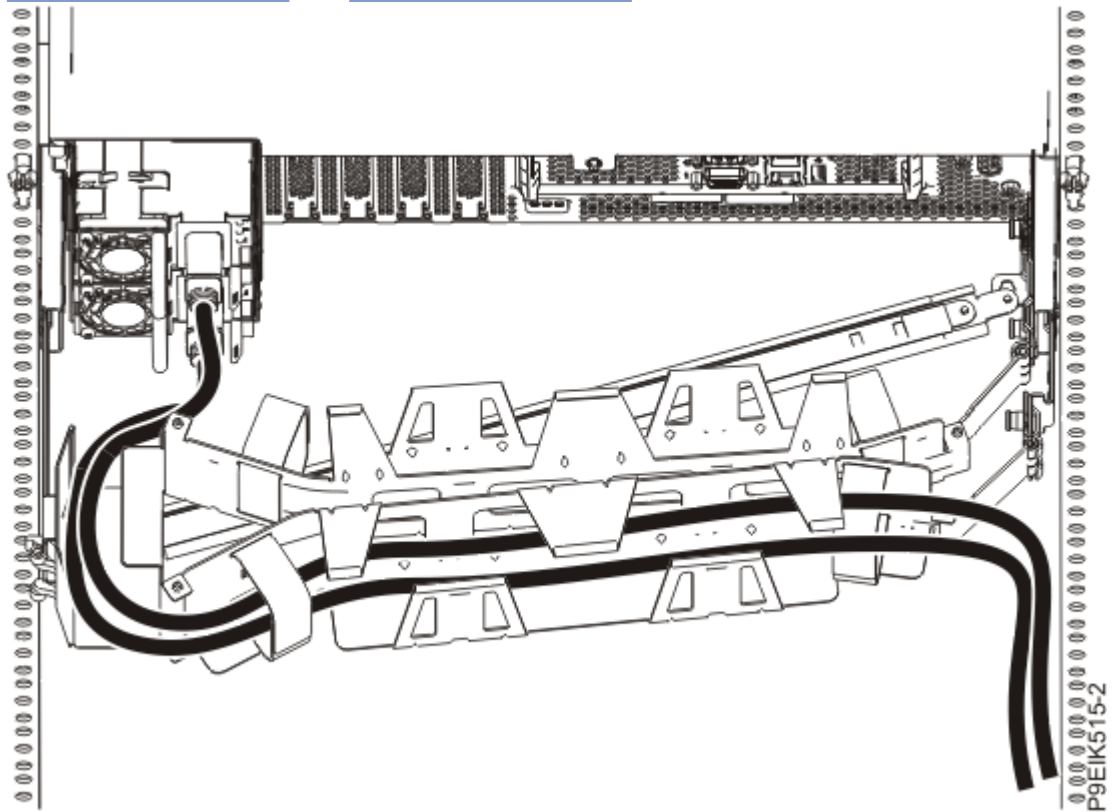


Figure 203. Routing the power cord loop in the cable management arm

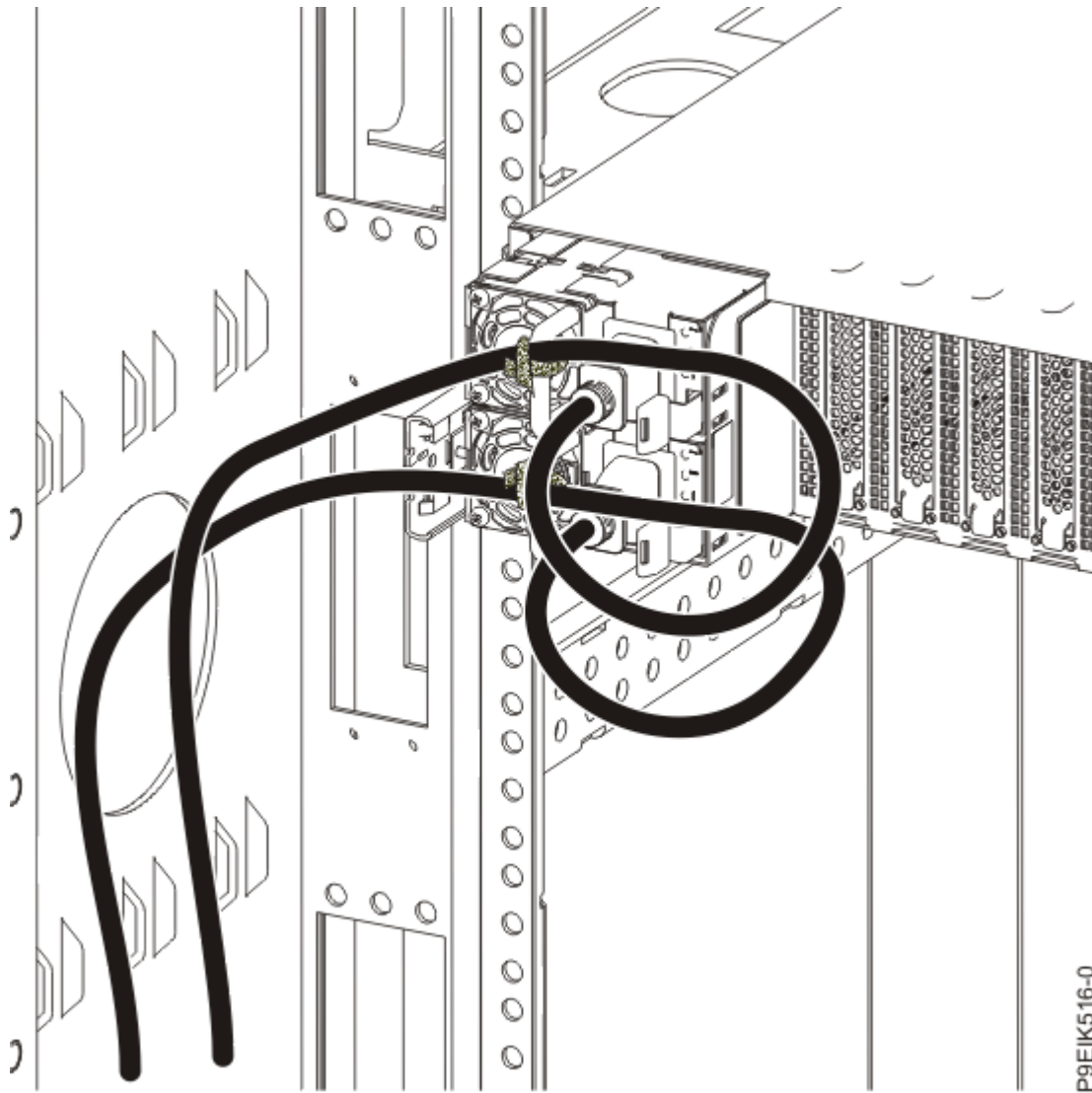


Figure 204. Power cord loop with sidewall routing

4. Disconnect the power cords from the system unit as shown in [Figure 205](#) on page 235.

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.

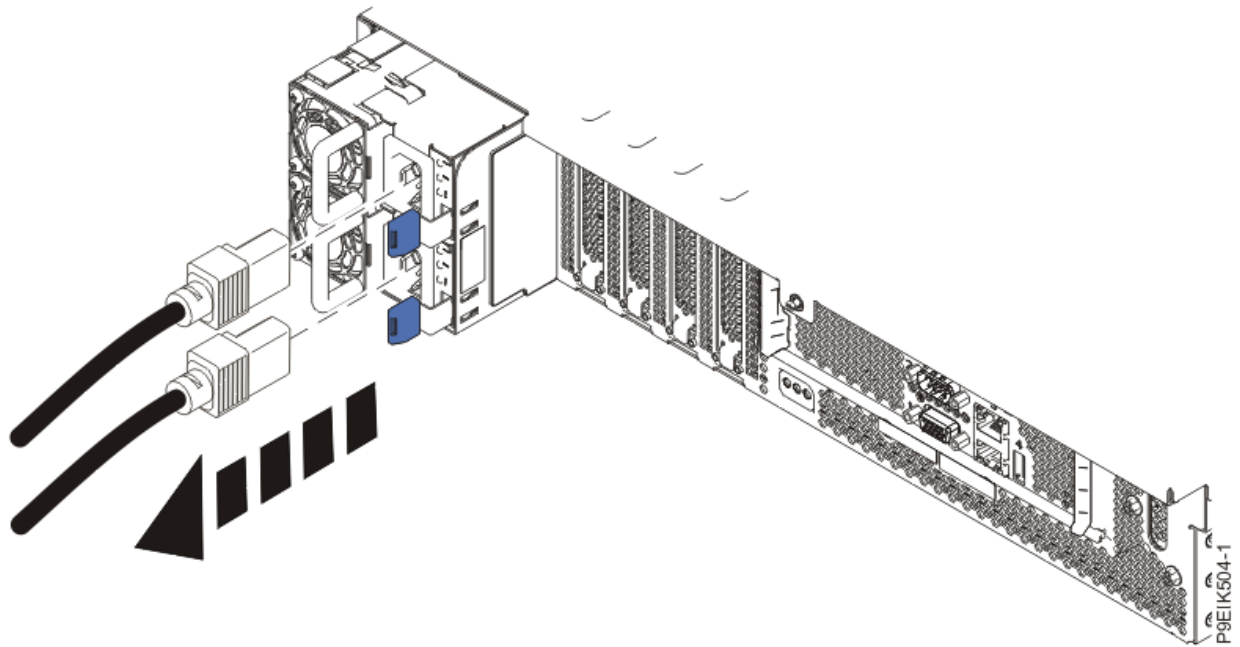


Figure 205. Removing the power cords from the system

Connecting power cords to an 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system

To connect a power cord, complete the steps in this procedure.

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 as shown in [Figure 206 on page 235](#).

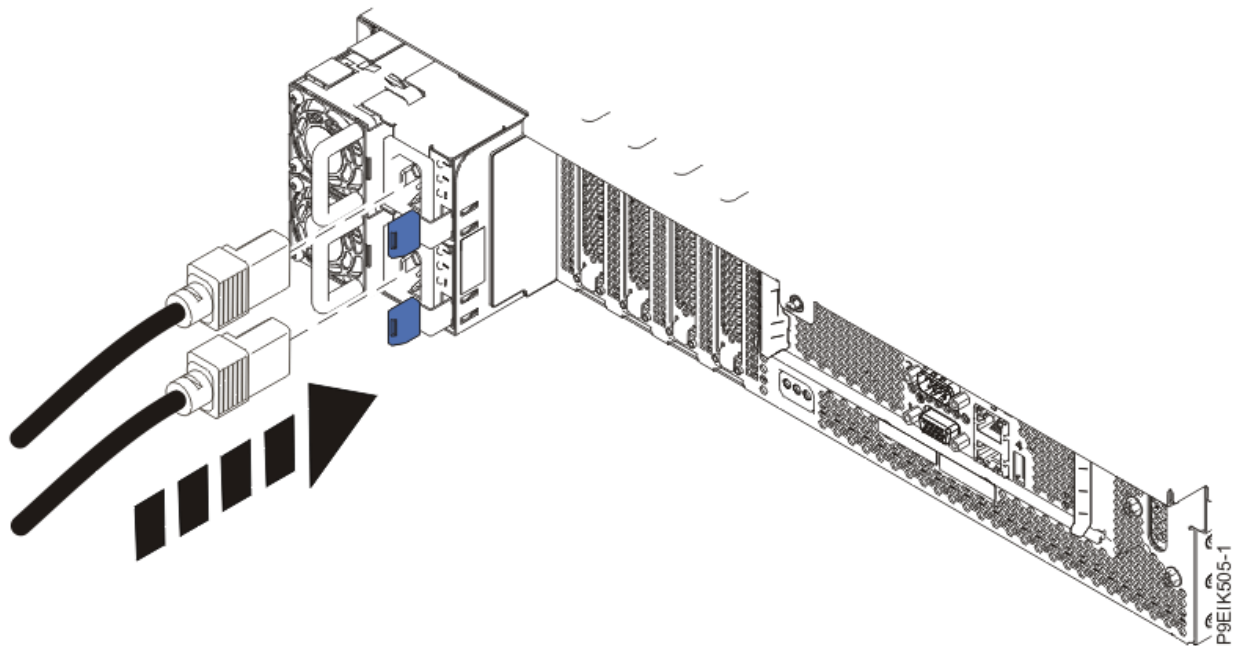


Figure 206. Connecting the power cords to the system

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. Use the hook-and-loop fastener to tie the power cord to the power supply handle.

Figure 207 on page 236 and Figure 208 on page 237 shows how to loop the cables.

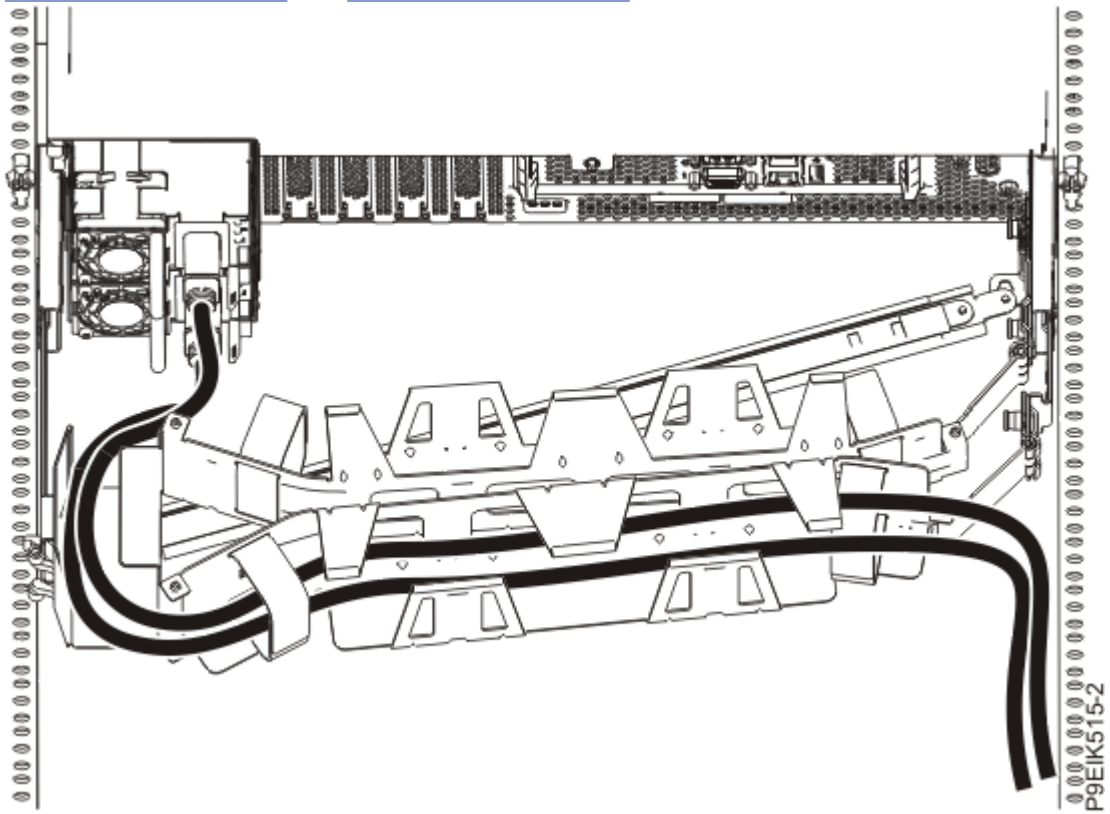


Figure 207. Routing the power cord loop in the cable management arm

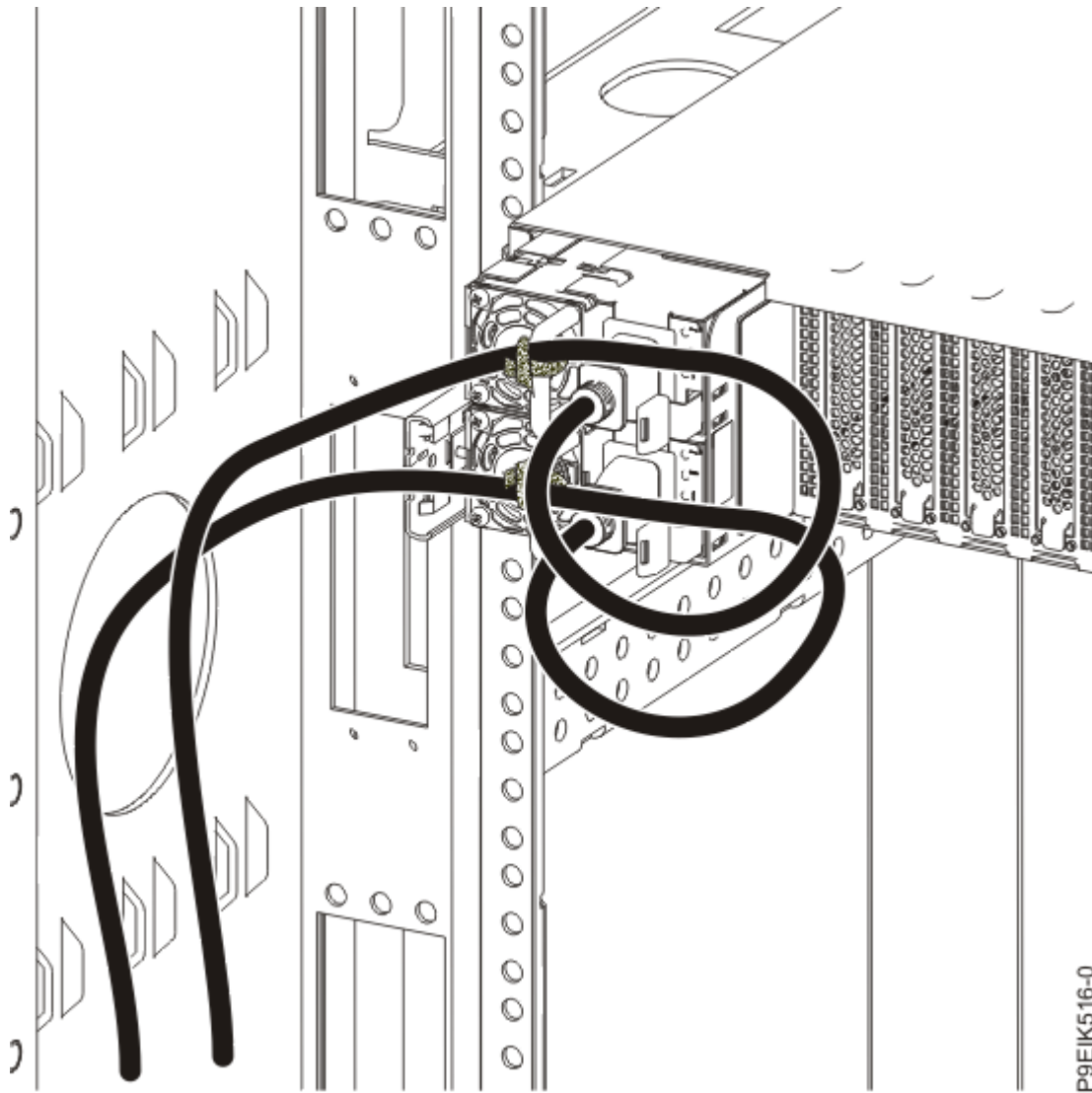


Figure 208. Power cord loop with sidewall routing

4. Close the rack door at the rear of the system.

Updating the system firmware level of a BMC card to OP940.20, or later, in an 8335-GTH or 8335-GTX system

To update the system firmware level of a BMC card to OP940.20, or later, complete the steps in this procedure.

Procedure

1. Are you able to connect the BMC card to the network with a Dynamic Host Configuration Protocol (DHCP) IP address?

If	Then
Yes	Update the system firmware level of the BMC card to OP940.20, or later. For instructions, see Updating the system firmware by using the OpenBMC tool . If you are not able to update the system firmware level, continue with the next step.
No	Continue with the next step.

2. Power off the system and place it in the service position. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.](#)

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

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

4. Remove the air baffles.

5. Install the system processor jumpers on the system backplane as shown in [Figure 209 on page 239.](#)

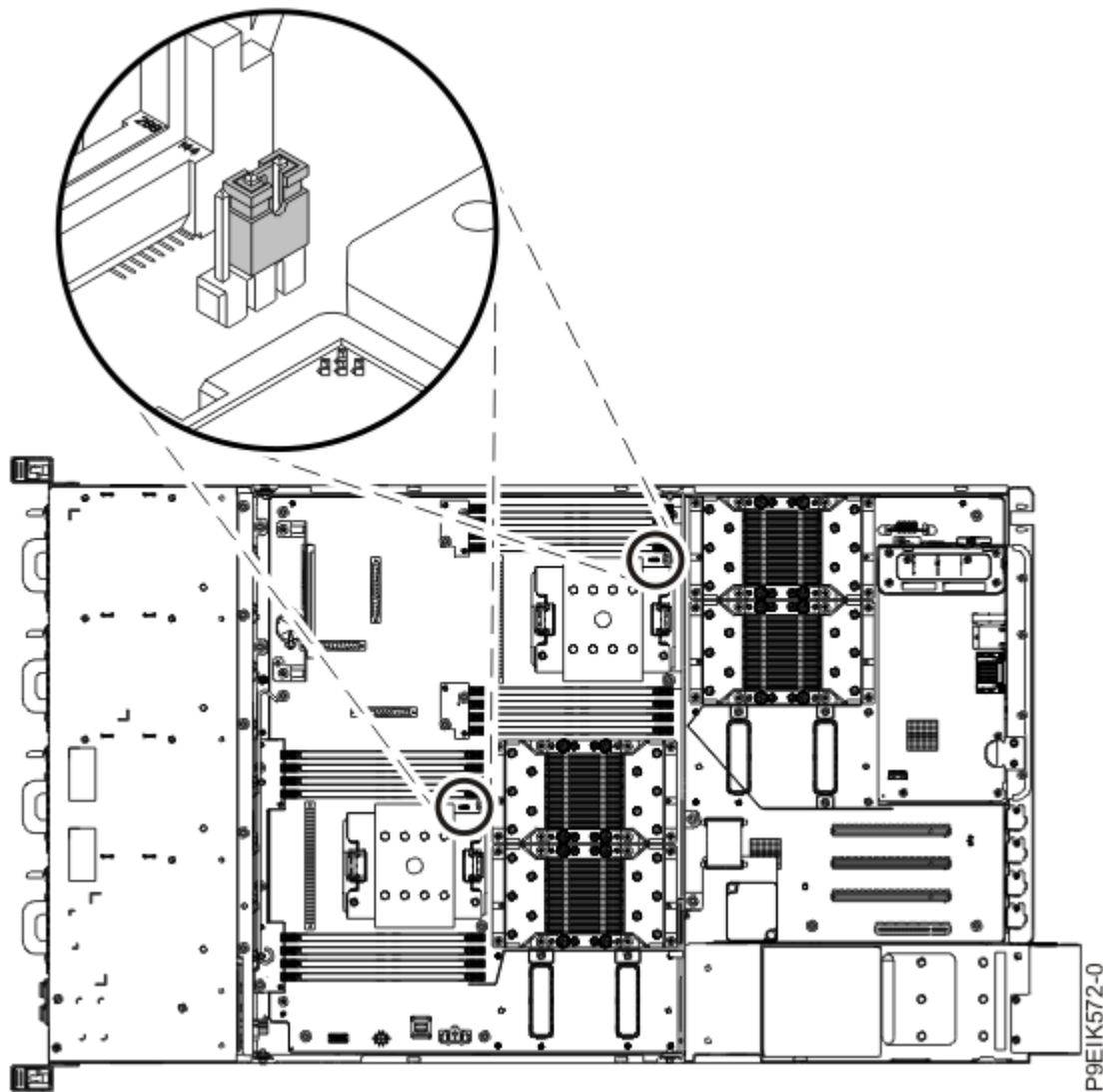


Figure 209. System processor jumper positions

6. Install the air baffles.
7. Prepare the system for operation. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220.
8. Update the system firmware level of the BMC card to OP940.20, or later. For instructions, see [Updating the system firmware by using the OpenBMC tool](#).

Note: If you are not able to update the system firmware level, contact your next level of support.

9. Power off the system and place it in the service position. For instructions, see “Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system to remove and replace internal parts” on page 216.
10. Attach the electrostatic discharge (ESD) wrist strap.

The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

11. Remove the air baffles.

12. Remove the system processor jumpers from the system backplane as shown in [Figure 210 on page 240](#).

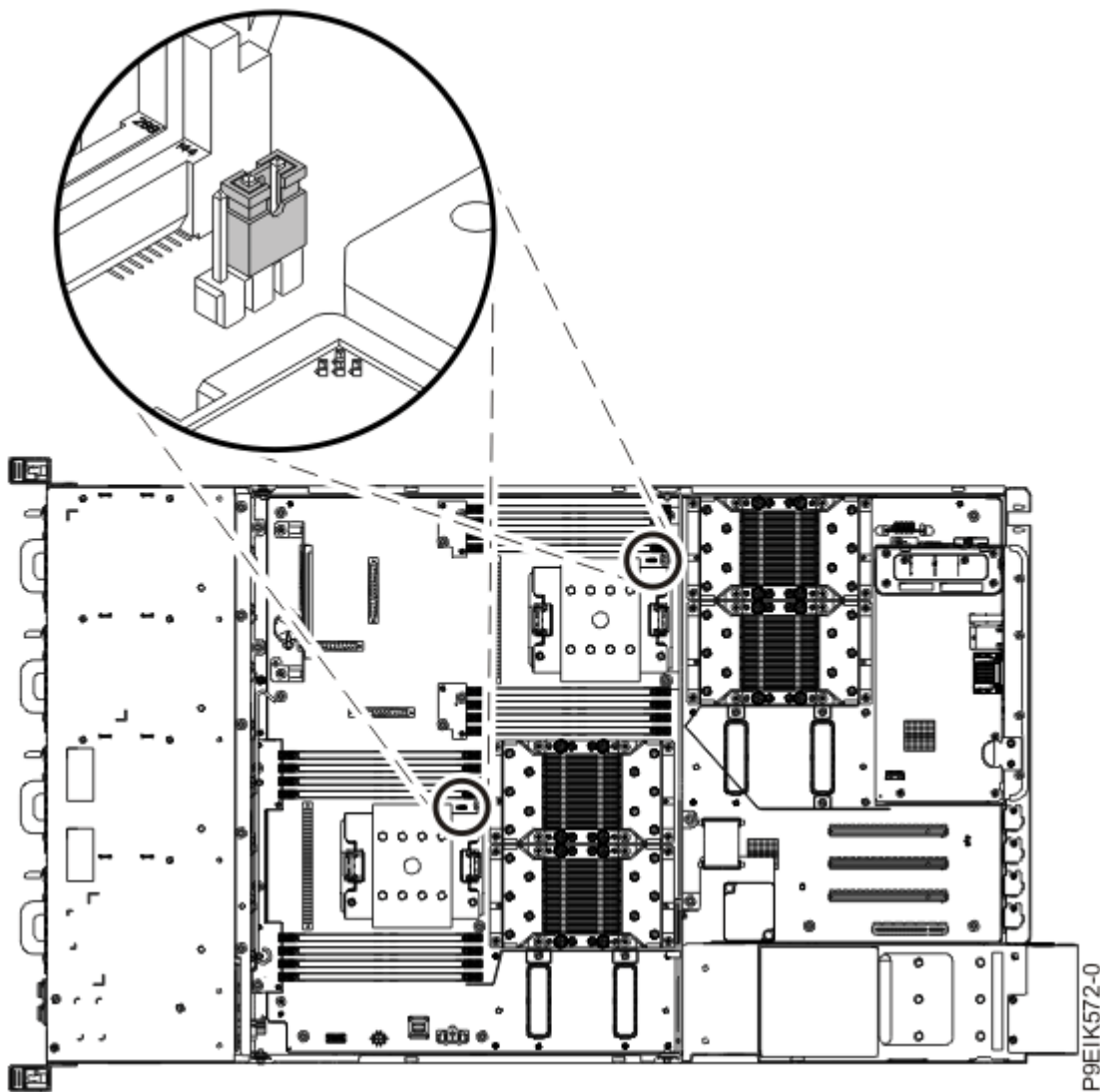


Figure 210. System processor jumper positions

13. Install the air baffles.

14. Prepare the system for operation. For instructions, see [“Preparing the 8335-GTC, 8335-GTG, 8335-GTH, 8335-GTW, or 8335-GTX system for operation after you remove and replace internal parts” on page 220](#).

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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 \(www.w3.org/TR/wai-aria/\)](http://www.w3.org/TR/wai-aria/), to ensure compliance with [US Section 508 \(www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards\)](http://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 \(www.w3.org/TR/WCAG20/\)](http://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.

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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.

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TTY service
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This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A

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電話：0800-016-888

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Responsible Party:
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New Orchard Road
Armonk, NY 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

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Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse B

Japan Electronics and Information Technology Industries Association (JEITA) Notice

(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 applies to 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 applies to 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 applies to 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

Japan Voluntary Control Council for Interference (VCCI) Notice

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VCCI-B

Taiwan Notice

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

United States Federal Communications Commission (FCC) Notice

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 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.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, New York 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

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