

Power Systems

*Installing an EMX0 PCIe Gen3 I/O
expansion drawer*



Note

Before using this information and the product it supports, read the information in [“Safety notices” on page v](#), [“Notices” on page 37](#), the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM® Power® servers that contain the Power 10 processor and to all associated models.

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Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, 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 (compliance ID RACK-001 or 22U (compliance ID RR001) and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.

- Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 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)



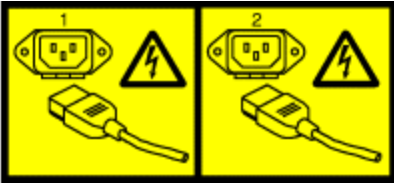
DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- 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

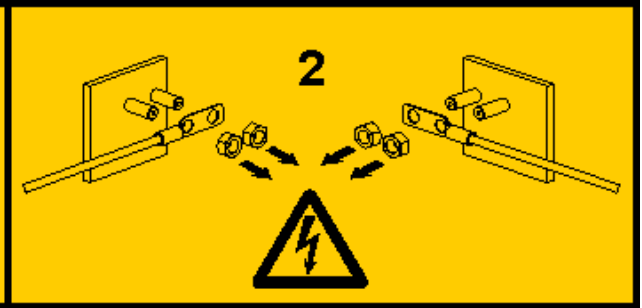
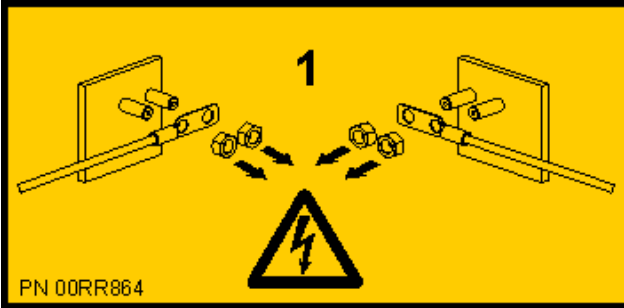


or



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)

(L018)



or



CAUTION: High levels of acoustical noise are (or could be under certain circumstances) present. Use approved hearing protection and/ or provide mitigation or limit exposure. (L018)

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)(C003a)



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

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

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

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

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

Installing an EMX0 PCIe Gen3 I/O expansion drawer

Learn how to install an EMX0 PCIe Gen3 I/O expansion drawer (EMX0 PCIe3 expansion drawer) into a rack or remove the shipping bracket from a preinstalled EMX0 PCIe3 expansion drawer. Then, learn how to connect the EMX0 PCIe3 expansion drawer to your system and activate the PCIe link.

Notes:

- If you have a POWER9™ processor-based 9080-HEX system and it is being installed at the same time as your EMX0 PCIe3 expansion drawer, the service provider completes the installation of the EMX0 PCIe3 expansion drawer. If you already have the 9080-HEX system that is installed, and you ordered an EMX0 PCIe3 expansion drawer, the installation and setup of the EMX0 PCIe3 expansion drawer is a customer task. You can complete this task yourself, or contact a service provider to complete the task for a fee.
- If you have a POWER8® processor-based 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system and it is being installed at the same time as your EMX0 PCIe3 expansion drawer, the service provider completes the installation of the EMX0 PCIe3 expansion drawer. If you already have the 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system that is installed, and you ordered an EMX0 PCIe3 expansion drawer, the installation and setup of the EMX0 PCIe3 expansion drawer is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you for a fee.
- If you have any other type of system, the installation and setup of the EMX0 PCIe3 expansion drawer is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you for a fee.

Installing or setting up an EMX0 PCIe3 expansion drawer

Learn how to install an EMX0 PCIe3 expansion drawer into a rack or set up a preinstalled EMX0 PCIe3 expansion drawer.

Complete the following tasks to install or set up an EMX0 PCIe3 expansion drawer:

1. [Preparing to install or set up an EMX0 PCIe3 expansion drawer](#)
2. [Completing inventory for the EMX0 PCIe3 expansion drawer](#)
3. [Determining and marking the location in the rack](#)
4. [Attaching the mounting hardware to the rack](#)
5. [Installing the EMX0 PCIe3 expansion drawer into the rack](#)

Preparing the system to install or set up an EMX0 PCIe3 expansion drawer

Find information about the prerequisites for installing your EMX0 PCIe3 expansion drawer.

About this task

Important: Changing the cable configuration of an existing EMX0 PCIe3 expansion drawer or drawers can result in unintended I/O configuration changes, including a change to the bus numbers assigned to existing expansion drawers. When bus numbers change, partition profiles cannot find existing I/O resources.

To prepare the system to install an EMX0 PCIe3 expansion drawer, complete the following steps:

Procedure

1. Ensure that you have installed the wanted number of PCIe3 6-slot fanout modules in the EMX0 PCIe3 expansion drawer.

For instructions, see the following procedures:

- If your system is managed by an HMC, see [PCIe adapters](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/hmcinstall.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/hmcinstall.htm>).
 - If your system is not managed by an HMC, see [Installing the PCIe3 6-slot fanout module in the EMX0 PCIe Gen3 I/O expansion drawer](http://www.ibm.com/support/knowledgecenter/POWER10/p10egv/p10egv_emx0_kickoff_install.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10egv/p10egv_emx0_kickoff_install.htm).
2. Determine the level of software that you need to support the drawer.
For instructions, see the [Power Systems Prerequisites](https://www14.software.ibm.com/support/customer/ipt/home) website (<https://www14.software.ibm.com/support/customer/ipt/home>).
 3. Choose from the following options:
 - If your EMX0 PCIe3 expansion drawer arrived to your site preinstalled in a rack, continue with the step “4” on [page 2](#).
 - If your EMX0 PCIe3 expansion drawer needs to be installed into a rack, continue with step “5” on [page 3](#).
 4. If your EMX0 PCIe3 expansion drawer arrived to your site preinstalled in a rack, complete the following steps:
 - a) Ensure that you have the following items before you begin working on your preinstalled system:
 - #1 and #2 Phillips screwdriver
 - Flat-head screwdriver
 - b) Remove the shipping bracket by completing the following steps:
 - i) 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.
 - ii) Using a #1 Phillips screwdriver or 7/32 socket, remove the two M4 screws **(B)** that secure the shipping bracket **(A)** to the EMX0 PCIe3 expansion drawer.

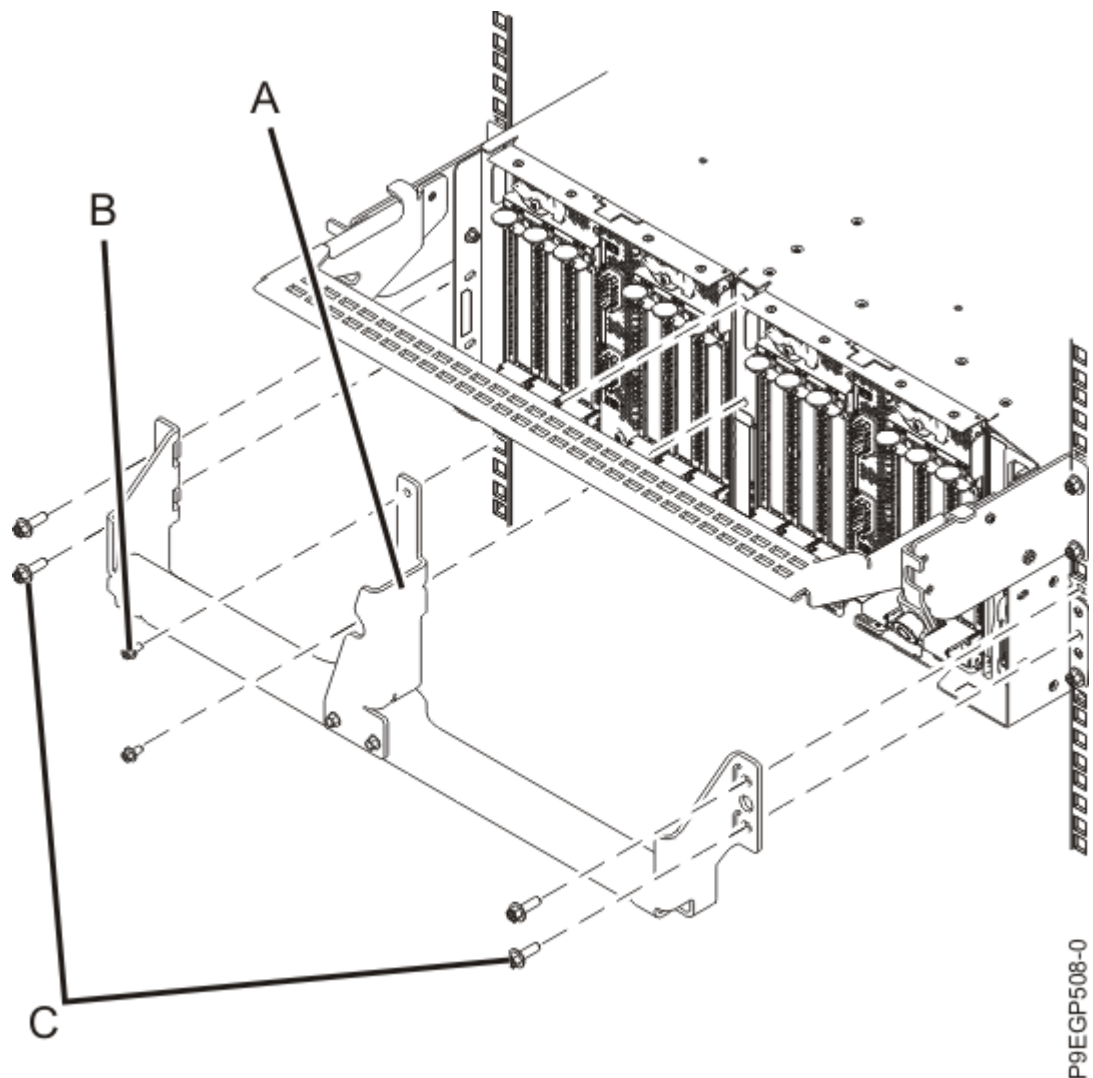


Figure 1. Removing the shipping bracket

- iii) Using a #2 Phillips screwdriver or 7 mm socket, remove the four M5 screws **(C)** that attach the shipping bracket **(A)** to the left and right flanges of the rack frame. Lift the bracket out and away from the rack frame.
- Tip:** Save the bracket for any future reinstallation or shipping of the drawer that might be required.
- c) Continue with [“Connecting an EMX0 PCIe3 expansion drawer to your system”](#) on page 18.
5. If you need to install your EMX0 PCIe3 expansion drawer into a rack, complete the following steps:
 - a) Ensure that you have the following items before you start your installation:
 - #1 and #2 Phillips screwdriver
 - Flat-head screwdriver
 - Rack with four Electronic Industries Alliance (EIA) units of contiguous space

Note: If you do not have a rack that is installed, install the rack. For instructions, see [Racks and rack features](http://www.ibm.com/support/knowledgecenter/POWER10/p10hbf/p10hbf_10xx_kickoff.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10hbf/p10hbf_10xx_kickoff.htm).

 - Help to lift the EMX0 PCIe3 expansion drawer into the rack, which requires three people.
 - b) Determine where to install a new EMX0 PCIe3 expansion drawer.

Consider several elements that include size, security, and environmental factors. For more information, see [Site preparation and physical planning \(http://www.ibm.com/support/knowledgecenter/POWER10/p10ebe/p10ebe_kickoff.htm\)](http://www.ibm.com/support/knowledgecenter/POWER10/p10ebe/p10ebe_kickoff.htm).

- c) Continue with [“Completing inventory for installing the EMX0 PCIe3 expansion drawer” on page 4.](#)

Completing inventory for installing the EMX0 PCIe3 expansion drawer

Find information about completing inventory for the EMX0 PCIe3 expansion drawer.

Procedure

1. Refer to the inventory list, and verify that you received all of the parts that you ordered. At a minimum, each order contains the following items:
 - Left and right rack-mounting hardware
 - Mounting screws
 - Power supply cables
 - Expansion drawer cable pairs in 2-meter, 3-meter, 10-meter, or 20-meter lengths.

Notes:

- The 2-meter cables are used for intra-rack installations that are using a cable management bracket.
 - The 3-meter cables are used for intra-rack installations that are using a cable management arm.
 - The 10-meter cables are used for inter-rack installations.
 - The 20-meter cables might be needed for inter-rack installations that have a Power 10 processor-based 9080-HEX system or a POWER8 processor-based 9080-MHE, 9080-MME, 9119-MME, or 9119-MHE system.
2. If your shipment contains parts that are not required to complete the installation procedure, store those parts in case they are needed in the future.
 3. If you have incorrect, missing, or damaged parts, consult any of the following resources:
 - Your IBM reseller.
 - IBM Rochester manufacturing automated information at 1-800-300-8751 (United States only).
 - See the [Directory of worldwide contacts](http://www.ibm.com/planetwide) website (<http://www.ibm.com/planetwide>). Select your location to view the service and support contact information.
 4. If you have incorrect, missing, or damaged parts, consult your next level of support.

Determining and marking the location in the rack

Find information about determining where to install the EMX0 PCIe3 expansion drawer into the rack.

About this task

If you received a mounting template, you can use the template to mark the locations instead of using the manual method that is described in steps [“6” on page 6](#) - [“9” on page 8](#).

Procedure

1. Read the [Rack safety notices](http://www.ibm.com/support/knowledgecenter/POWER10/p10hbf/p10hbf_racksafety.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10hbf/p10hbf_racksafety.htm).
2. Determine where in the rack to place the drawer in relation to other system hardware. As you plan for installing the drawer in a rack, keep in mind the following information:

Important:

- The EMX0 PCIe3 expansion drawer must be placed above the system when possible.
- If you must install the EMX0 PCIe3 expansion drawer below the system, the placement of the EMX0 PCIe3 expansion drawer in relation to your system is important so that the cable management bracket can function properly. Consider the following requirements:
 - If you install an EMX0 PCIe3 expansion drawer below a Power 10 processor-based 9105-22A, 9105-22B, 9105-41B, 9105-42A, 9105-42B, 9786-22H, or 9786-42H system, the EMX0 PCIe3 expansion drawer must be placed at least 2 Electronic Industries Alliance (EIA) units below the system.
 - If you install an EMX0 PCIe3 expansion drawer below a Power 10 processor-based 9040-MRX or 9781-50H system, the EMX0 PCIe3 expansion drawer must be placed at least 3 EIA units below the system.
 - If you install an EMX0 PCIe3 expansion drawer below a Power 10 processor-based 9080-HEX system, the EMX0 PCIe3 expansion drawer must be placed at least 1 EIA unit below the system.
 - If you install an EMX0 PCIe3 expansion drawer below a POWER8 processor-based 8247-21L, 8247-22L, 8247-42L, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E system, the EMX0 PCIe3 expansion drawer must be placed at least 2 EIA units below the system.

General location information includes the following recommendations:

- Organize larger and heavier units into the lower part of the rack.
 - Plan to install units into the lower part of the rack first.
 - Record the EIA locations in your plan.
3. If necessary, open or remove the front and rear rack doors.
 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. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the enclosure or drawer.

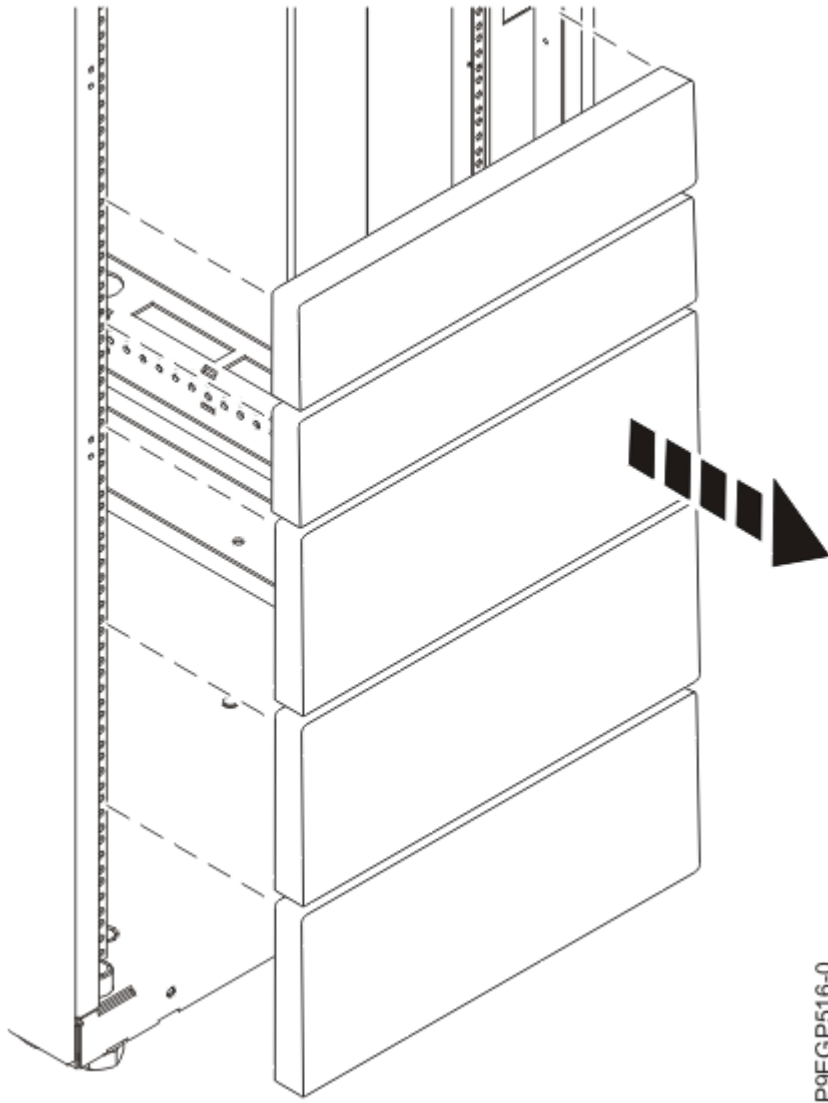


Figure 2. Removing the filler panels

6. Face the front of the rack and work from the left side to complete the following steps:

Note: If you received a mounting template, you can use the template to mark the locations instead of using the following steps.

- Make a note of both the lowest and highest EIA units to be used for the drawer.
- Use tape, a marker, or a pencil to mark the top mounting hole of the third EIA unit **(A)** from the lowest EIA unit you marked. Insert a nut clip at this location.

Note: Mark the rack so that these marks can also be seen from the rear of the rack.

- Mark the top mounting hole on the lowest EIA unit **(B)**.
- Count up two holes and place another mark beside that mounting hole **(B)**. You now have two marks on the rack **(B)**, with one mounting hole between the marks.

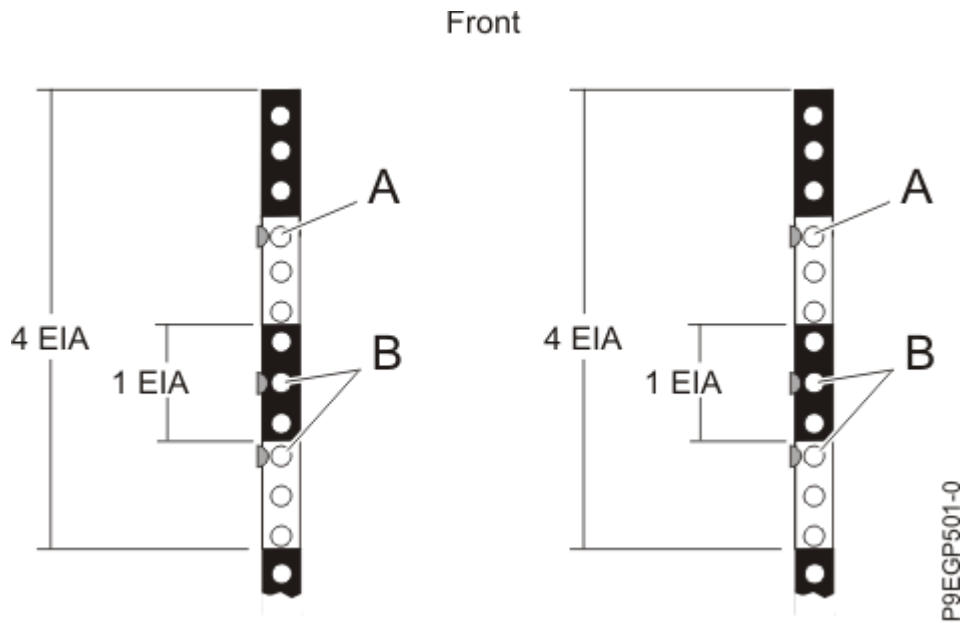


Figure 3. Marking the front installation locations

Note: During this procedure, put nut clips in the **(A)** marks. Then, during the procedure to attach the mounting hardware to the rack, put rail pins in the **(B)** marks.

7. Repeat step “6” on page 6 to place three marks on the corresponding mounting holes on the front-right side of the rack. Insert a nut clip in the **(A)** mark.
8. Go to the rear of the rack and work from the left side to complete the following steps:
 - a) Find the EIA unit that corresponds to the lowest EIA unit marked on the front of the rack.
 - b) Use tape, a marker, or a pencil to mark the top mounting hole of this EIA unit **(C)**.
 - c) Count up two holes and place another mark beside that mounting hole **(C)**. You now have two marks **(C)** on the rack, with one mounting hole between the marks.
 - d) Count up three mounting holes from where you placed your last mark, and place another mark next to that mounting hole **(D)**.
 - e) Count up three holes and place another mark beside that mounting hole **(D)**. You now have two marks on the rack **(D)**. Insert nut clips in these two locations.

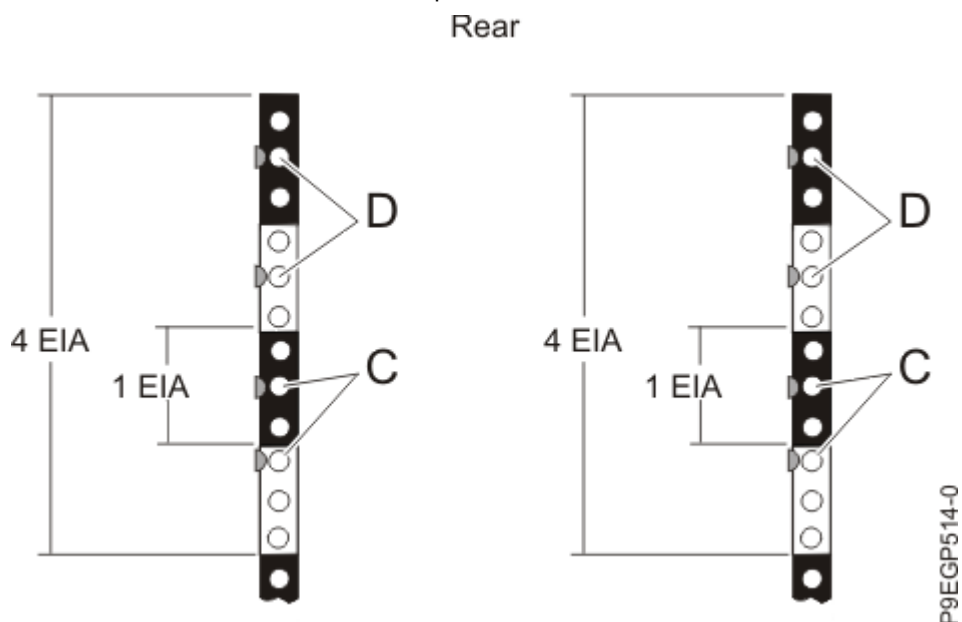


Figure 4. Marking the rear installation locations

Note: During this procedure, put nut clips in the **(D)** marks. Then, during the procedure to attach the mounting hardware to the rack, put rail pins in the **(C)** marks.

9. Repeat step “8” on page 7 to place four marks on the corresponding mounting holes on the rear-right side of the rack. Insert nut clips in the **(D)** marks.

Attaching the mounting hardware to the rack

Find information about attaching the mounting hardware to the rack and then installing the rails into the rack. The information is intended to promote safety and reliable operation, and includes illustrations of the related hardware components and shows how these components relate to each other.

About this task



Attention: To avoid rail failure and potential danger to yourself and to the unit, ensure that you have the correct rails and fittings for your rack. If your rack has square support flange holes or screw-thread support flange holes, ensure that the rails and fittings match the support flange holes that are used on your rack. Do not install mismatched hardware by using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller.

Important: To complete this procedure, it is suggested that you use two people to attach the rail assembly to the rack. Position one person in front of the rack and one person at the back of the rack.

Procedure

1. Gather the rail kit parts that you need during this procedure.

The rail kit includes the following parts:

Note: The installation of the EMX0 PCIe3 expansion drawer does not require usage of all parts that are included in the rail kit.

- M3 flat head screws (used only with FC 5887)
 - L-shaped brackets (used only with FC 5887)
 - M5 slotted large round head screws and M5 slotted no head screws to accommodate various racks
 - Nut clips for racks with round holes
 - Nut clips for racks with square holes
 - M5 black hex head screws
 - Rails
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. Rotate down the front and back clamps **(C)** on the left and right rails.
 4. On each rail, remove the tape that is holding the spring **(B)** to the rail. Hook the end of the spring around the circular standoff on the rail.

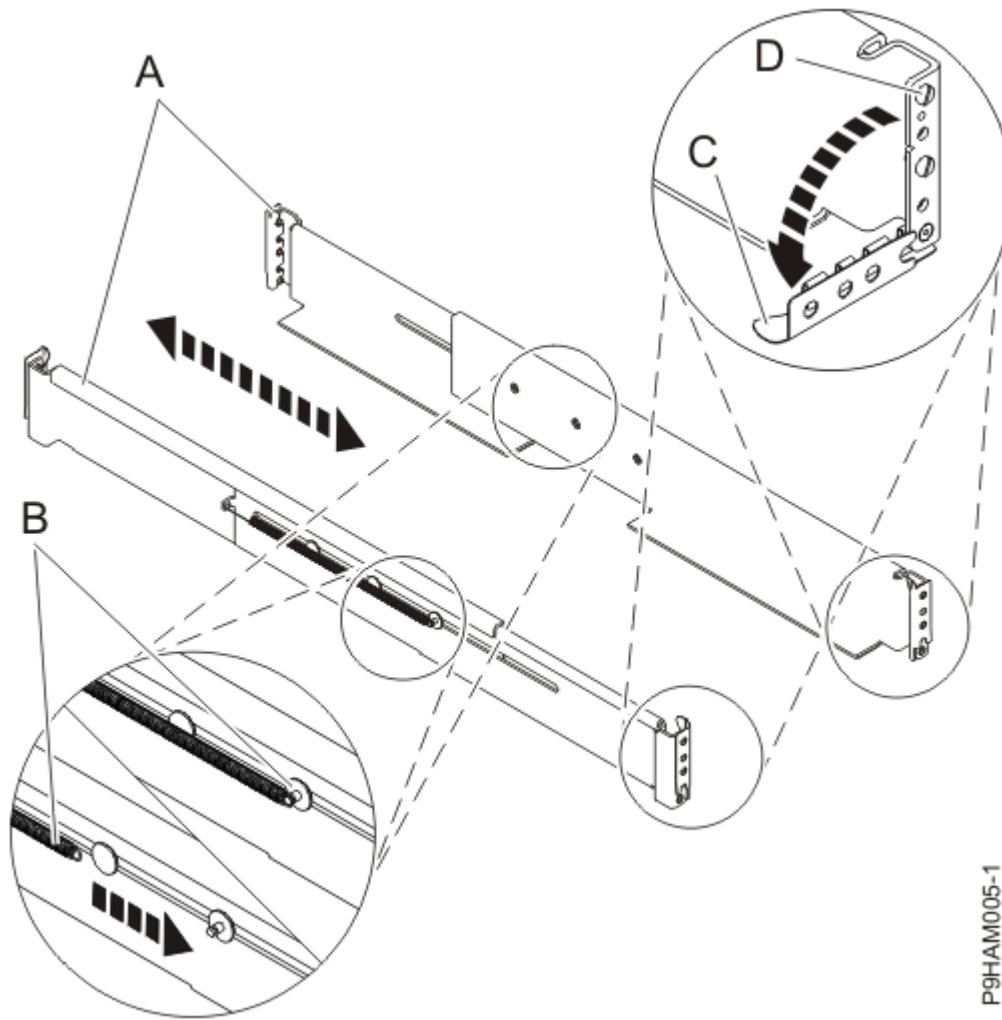


Figure 5. Installing the rails

5. Starting at the front of the rack, complete the following steps:

- Extend the right rail and insert the rail pins **(D)** into the two lowest mounting holes that are marked on the rack so that the rail is facing upward.
- Rotate up the front clamp **(C)** to secure the rail in place.

Remember: If your rack has square mounting holes, use the larger rail pins that are provided with the rack installation kit.

- Extend the left rail and insert the rail pins **(D)** into the two lowest mounting holes that are marked on the rack. Rotate up the front clamp **(C)** to secure the rail in place.

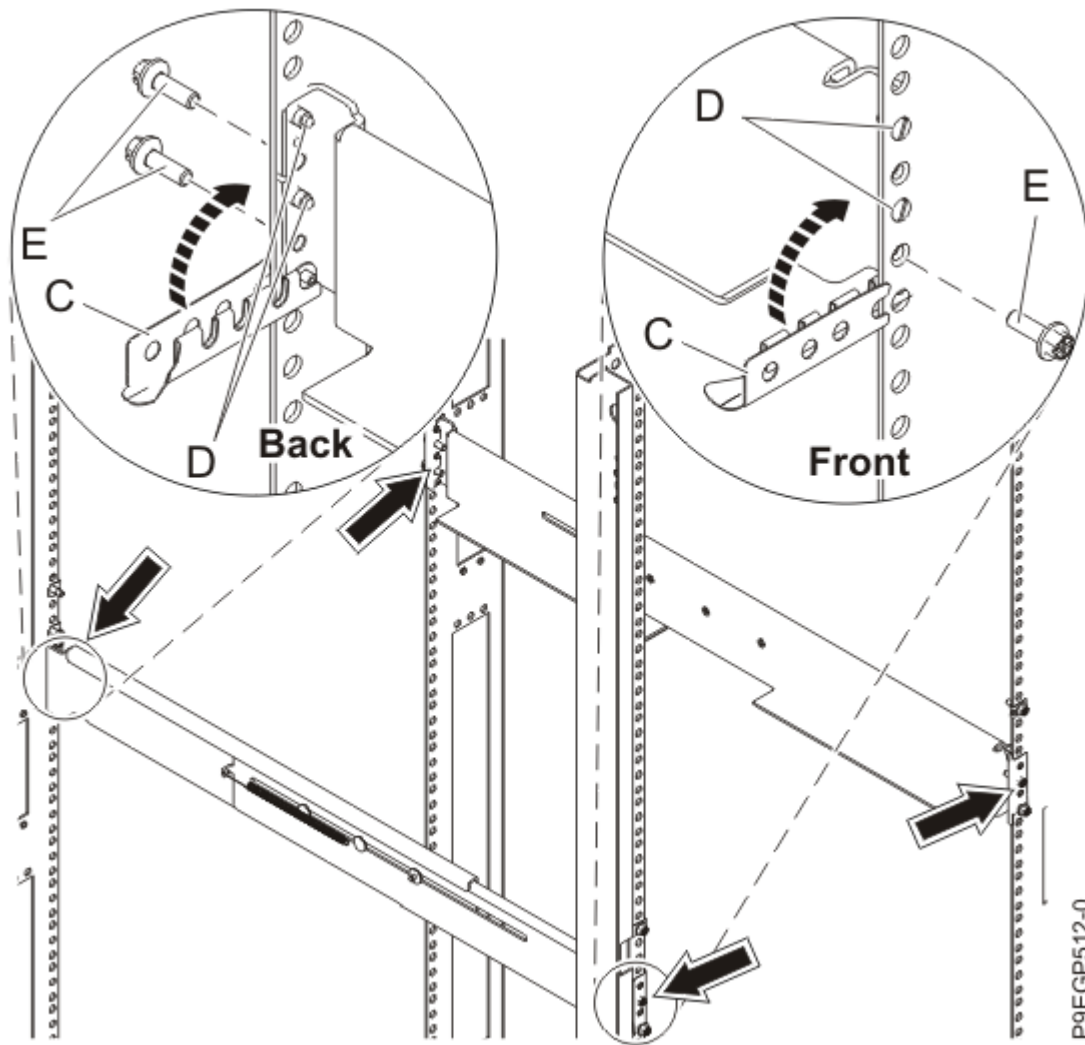


Figure 6. Attaching the rails

6. Move to the rear of the rack, and complete the following steps:
 - a) Extend the right rail, and insert the rail pins (**D**) into the two lowest mounting holes that are marked on the rack. Rotate up the back clamp (**C**) to secure the rail in place.
 - b) Extend the left rail and insert the rail pins (**D**) into the two lowest mounting holes that are marked on the rack. Rotate up the back clamp (**C**) to secure the rail in place.
 - c) Use two M5 screws (**E**), one below each rail pin (**D**) to secure the left rail to the back of the rack.
 - d) Use two M5 screws (**E**), one below each rail pin (**D**) to secure the right rail to the back of the rack.
7. Move to the front of the rack and complete the following steps:
 - a) Use one M5 screw (**E**) below the lower rail pin (**D**) to secure the left rail to the front of the rack.
 - b) Use one M5 screw (**E**), below the lower rail pin (**D**) to secure the right rail to the front of the rack.

Installing an EMX0 PCIe3 expansion drawer into a rack

Find information about installing an EMX0 PCIe3 expansion drawer into a rack.

Before you begin

Important: Three people are required to safely lift the drawer. Using fewer than three people to lift the drawer can result in injury.

About this task

To install an EMX0 PCIe3 expansion drawer into a rack, complete the following steps.

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 four thumb screws (**B**) that are used to secure the shipping cover (**A**) to the rear of the drawer, as shown in [Figure 7 on page 11](#). Remove the shipping cover.

Note: The shipping cover is secured to the drawer by two thumb screws on the top of the cover and one thumb screw on each side.

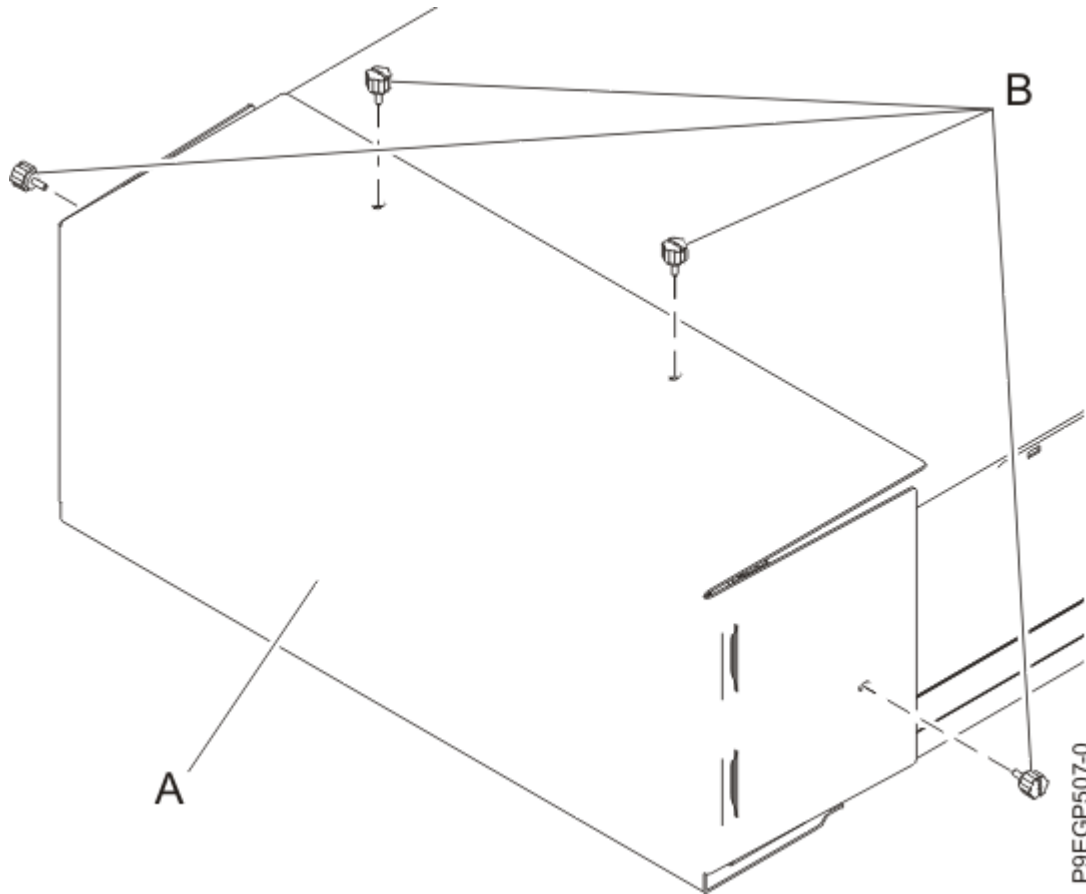


Figure 7. Removing the shipping cover

Tip: Save the shipping cover and screws that you remove for any future shipping of the drawer that might be required.

3. If the cover is installed on the front of the drawer, remove it by completing the following steps:
 - a. If there are M5 securing screws on the cover, remove them.
 - b. Using the two blue touch points on each side of the drawer, pull the cover straight out to remove the cover from the front of the drawer as shown in [Figure 8 on page 12](#).
 - c. Remove the service information card from the slot in the cover.

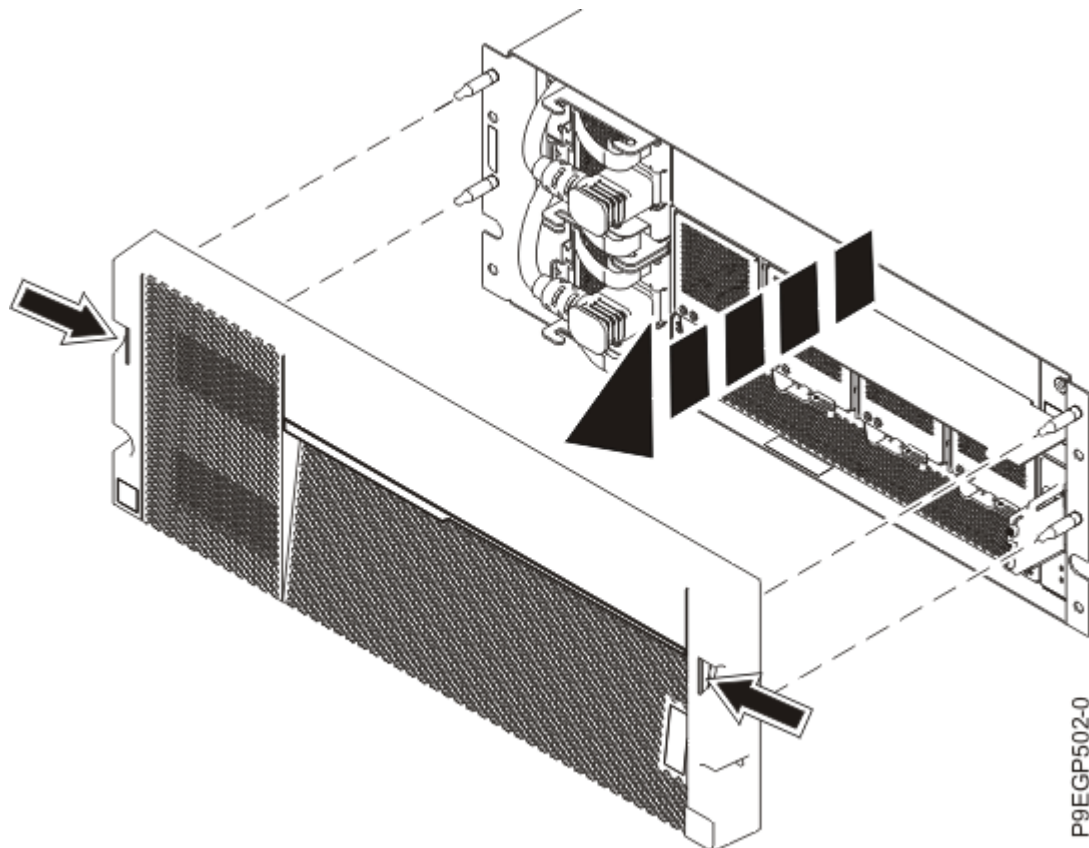


Figure 8. Removing the cover and the service information card

4. Install the drawer into the rack by completing the following steps:

- a) Using three people, have two people hold onto the four handles **(I)**, as shown in Figure 9 on page 13, and one person in front of the drawer to guide the drawer. Lift the drawer and position it over the front of the rails.



Attention: Three people are required to safely lift the drawer. Using fewer than three people to lift the drawer can result in injury.

- b) Slide the drawer into position over the slide rails and slide the drawer into the rack.
- c) Install the two M5 securing screws **(J)** through the drawer and into the nut clips on the left and right rails.

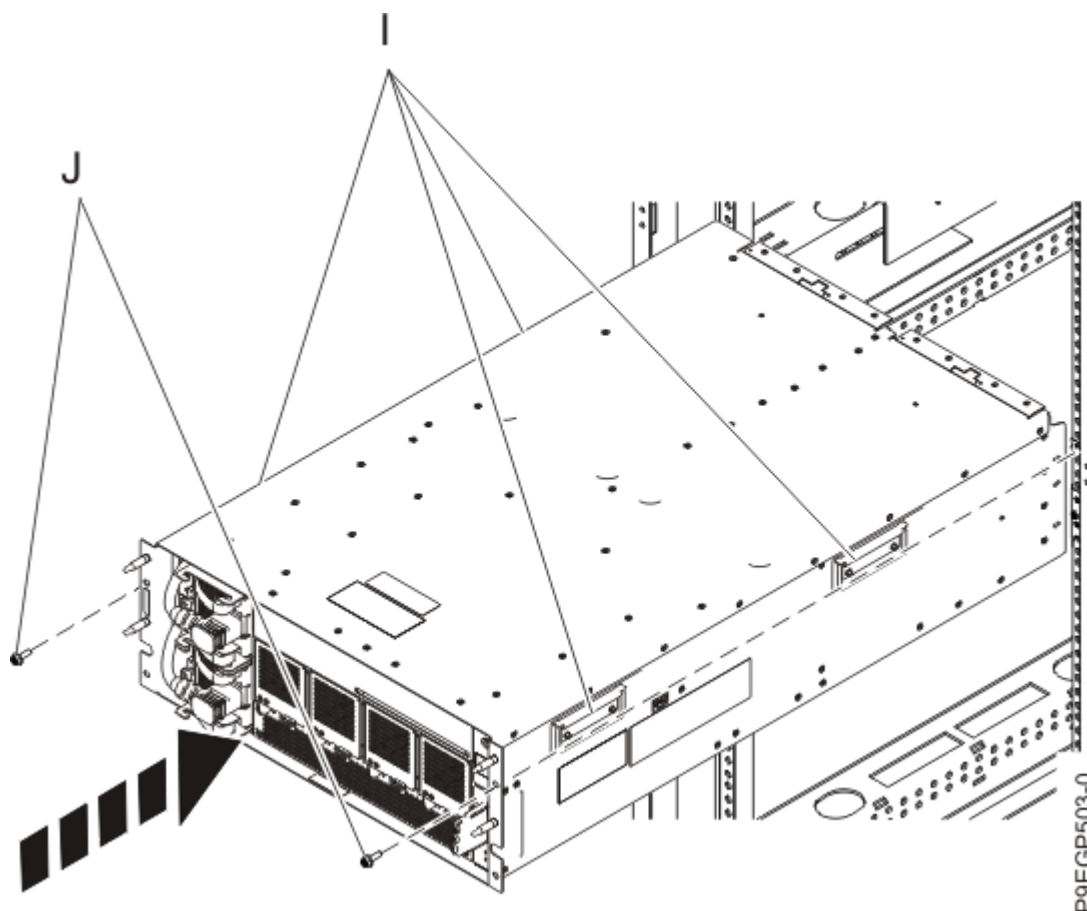


Figure 9. Installing the drawer into a rack

5. Install the cover onto the drawer by completing the following steps:
 - a) Press the cover (**L**) into place and secure it with two M5 screws (**M**) on the left and right rails as shown in Figure 10 on page 14.
 - b) Insert the service information card (**N**) into the slot in the cover.

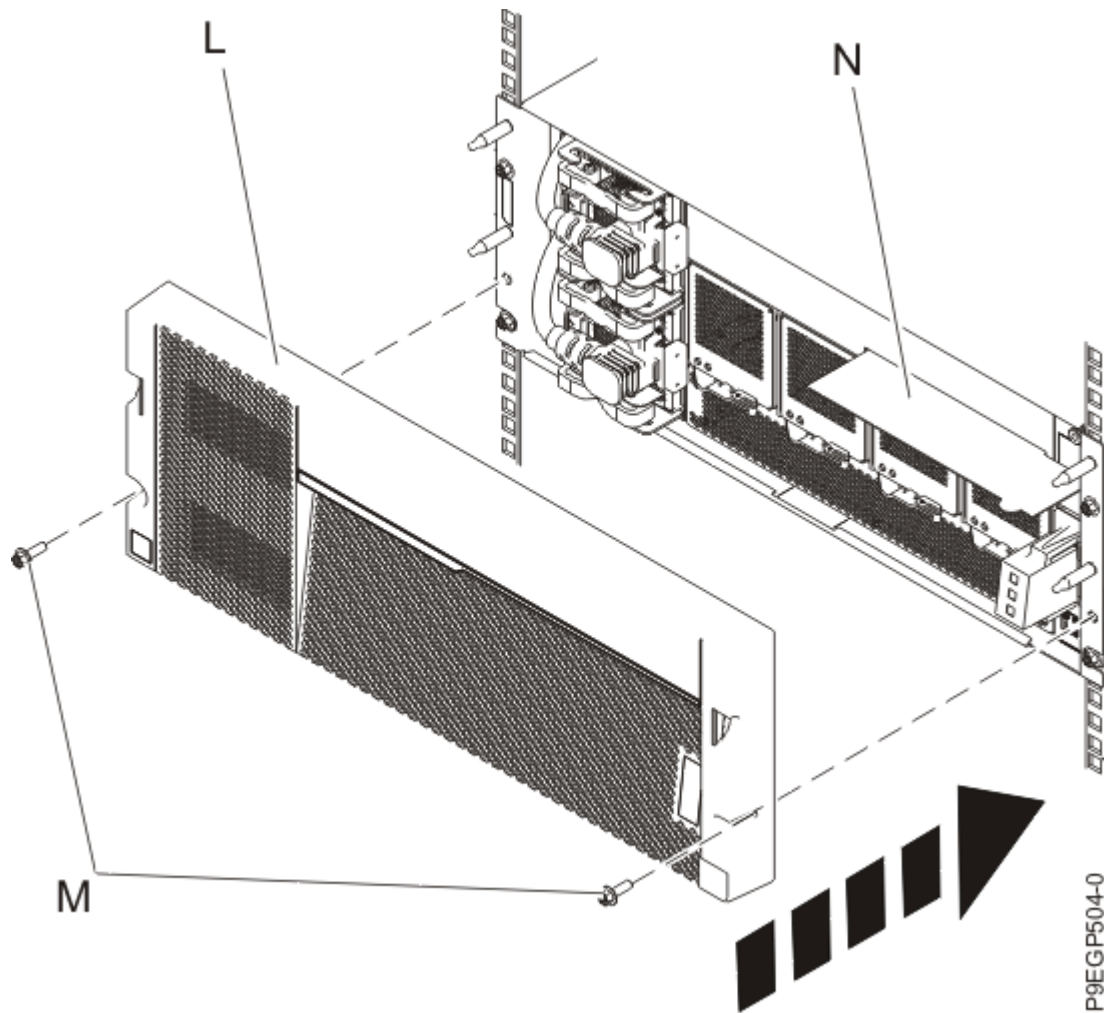


Figure 10. Installing the cover and service information card

6. Attach the cable management bracket to the rack by completing the following steps:
 - a. At the rear of the rack, partially tighten two M5 screws **(A)** directly above the drawer rail clamps where nut clips are installed. These two screws become the bottom screws that support the cable management bracket against the rack. See [Figure 11 on page 15](#).
 - b. Place the bottom of the mounting flanges on the cable management bracket **(B)** over the two M5 screws to support the bracket flanges against the rack.
 - c. Align the bracket so that its mounting flanges **(B)** align with the top holes in the rack flanges, as shown in [Figure 11 on page 15](#).
 - d. Completely tighten the top two M5 screws **(C)** above the rail clamp where nut clips are installed.
 - e. Finish tightening the bottom two M5 screws **(A)**.

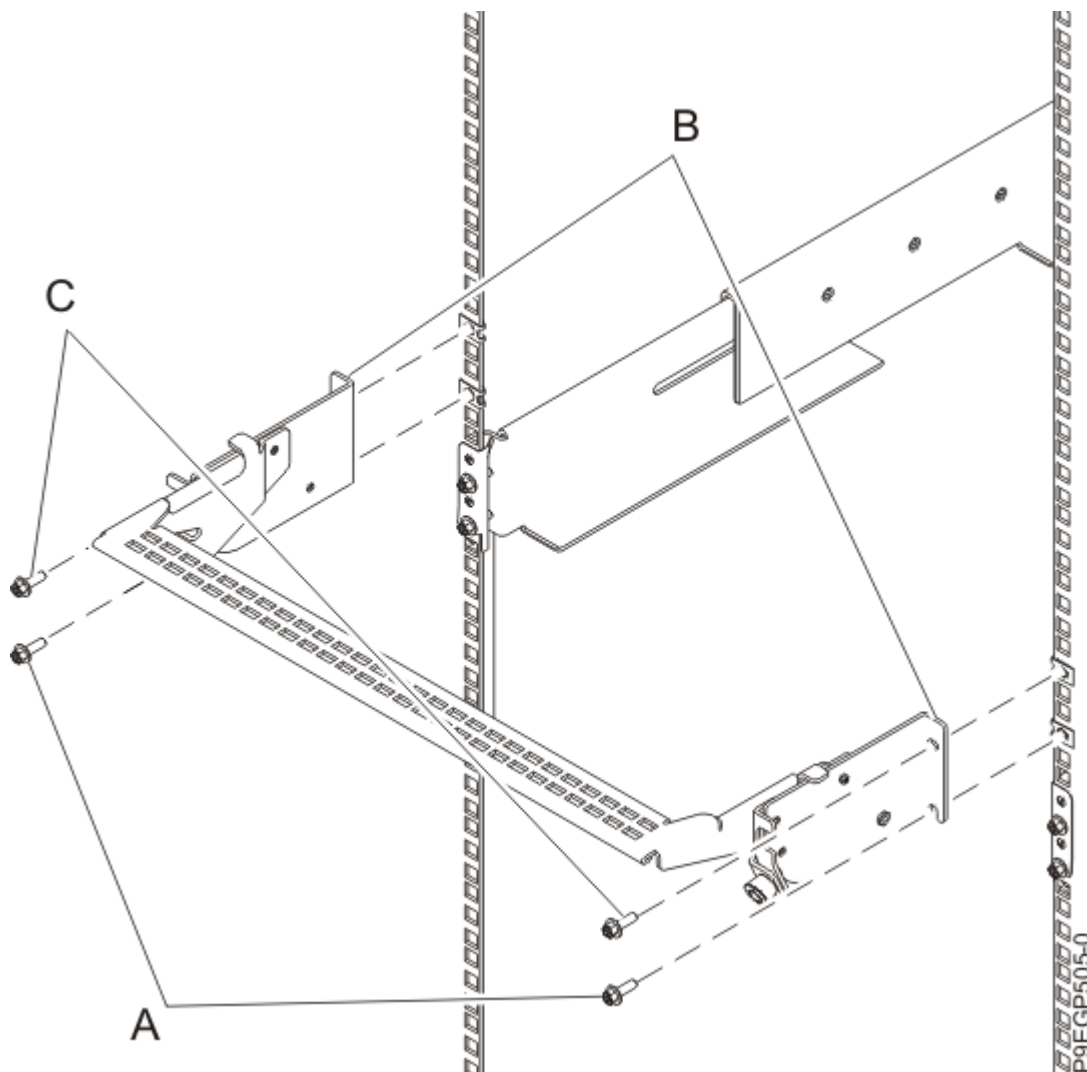
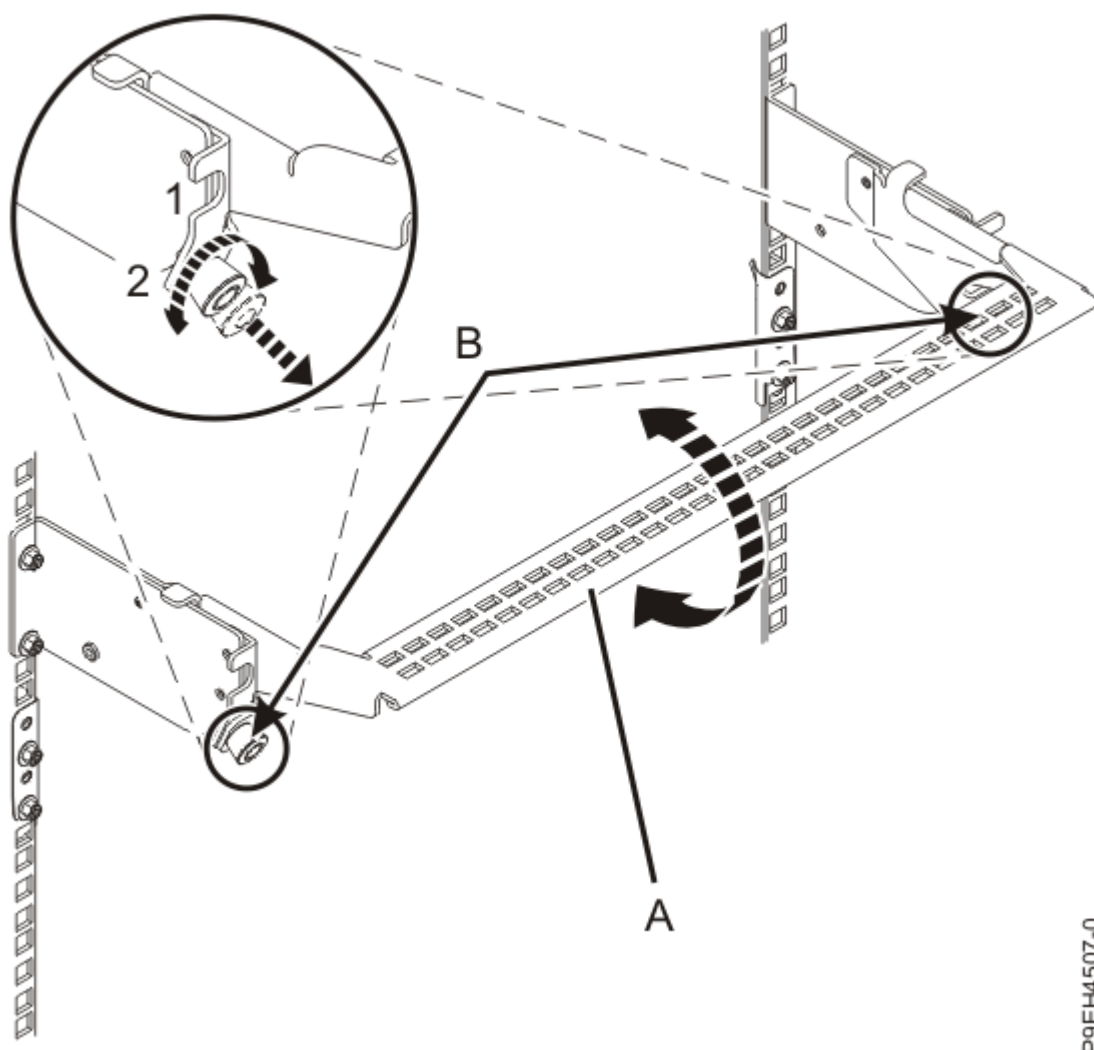


Figure 11. Installing the cable management bracket

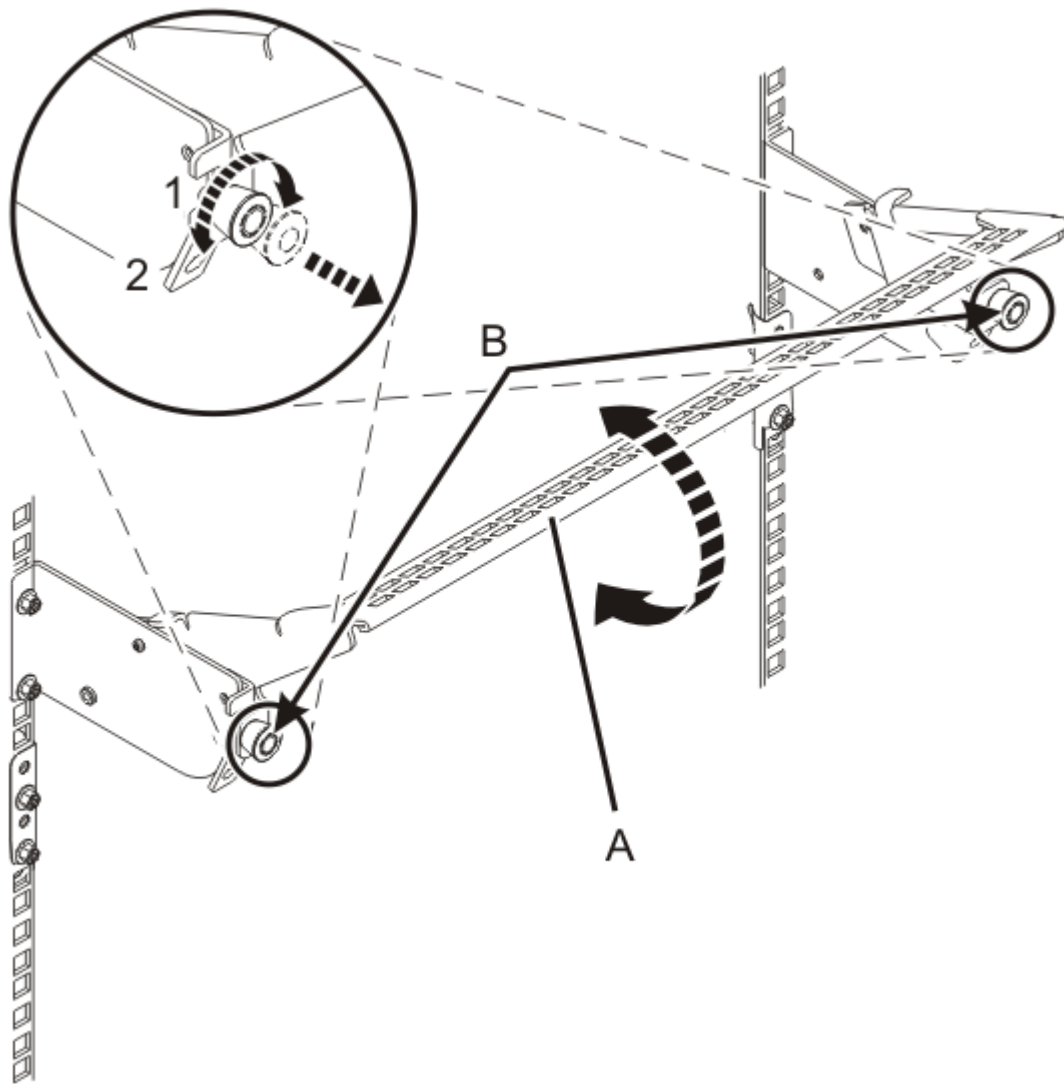
7. To put the cable management bracket in the service position, complete the following steps:
 - a. Pull out the quarter-turn fasteners and turn them to disengage them while you lift the cable management bracket to its raised position.
 - b. Turn the quarter-turn fasteners to engage and lock the bracket into position.



P9EH4507-0

Figure 12. Placing the cable management bracket in the service position

8. To put the cable management bracket in the operating position, complete the following steps:
 - a. Pull the quarter-turn fasteners **(B)** out and turn them to disengage them while moving the cable management bracket **(A)** to its lower position **(2)**. See [Figure 13 on page 17](#).
 - b. Turn the quarter-turn fasteners **(B)** to engage and lock the bracket into position.



P9EH4508-0

Figure 13. Placing the cable management bracket in the operating position

9. If you are using a ruggedized rack or relocating a rack with the EMX0 PCIe3 expansion drawer in it, secure the drawer to the rear of the rack by using the two securing screws **(B)** as shown in the following figure.

Note: If you have a different scenario, the securing screws are optional.

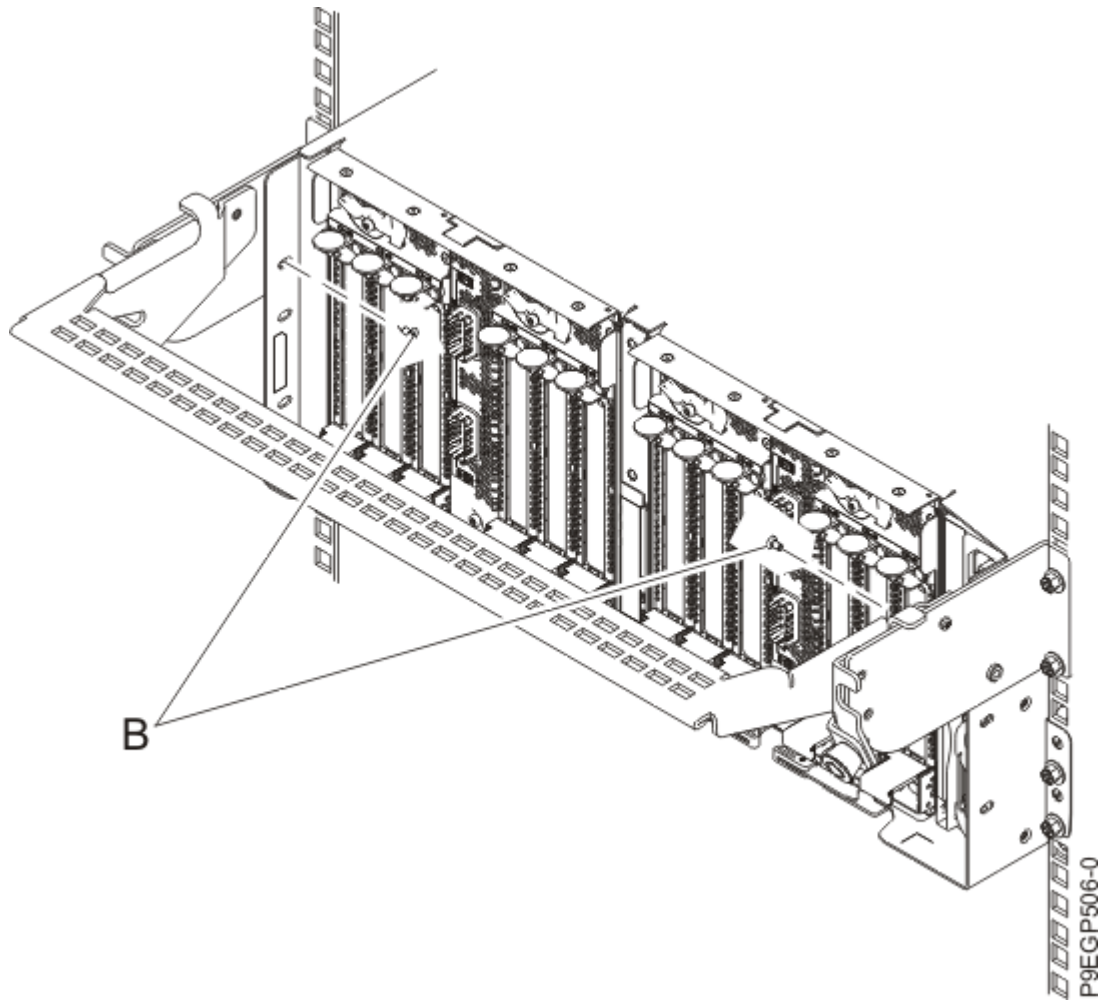


Figure 14. Inserting the securing screws at the rear of the system

Connecting an EMX0 PCIe3 expansion drawer to your system

Find information about connecting an EMX0 PCIe3 expansion drawer to your system.

Preparing the system to connect an EMX0 PCIe3 expansion drawer

To prepare the system to connect an EMX0 PCIe3 expansion drawer, complete the steps in this procedure.

About this task

Remember: Before you can connect a system to an EMX0 PCIe3 expansion drawer, your system must have the required number of cable adapters installed and the EMX0 PCIe3 expansion drawer must have the wanted number of PCIe3 6-slot fanout modules installed.

- For instructions to install a cable adapter when you do not have an HMC, see the installing, removing, and replacing parts topic for your system.
- For instructions to install a PCIe3 6-slot fanout module when you do not have an HMC, see [Installing the PCIe3 6-slot fanout module in the PCIe Gen3 I/O expansion drawer](http://www.ibm.com/support/knowledgecenter/POWER10/p10egv/p10egv_emx0_kickoff_install.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10egv/p10egv_emx0_kickoff_install.htm).
- For instructions to install a cable adapter or PCIe3 6-slot fanout module when your system is managed by an HMC, see [Installing a part by using the HMC](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/hmcinstall.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/hmcinstall.htm>).

Procedure

1. Determine the expansion drawer cable pair that can be used to connect the system to the EMX0 PCIe3 expansion drawer.
 - Each cable pair must be the same length. You can verify the cable lengths by viewing the length labels that are on the plug ends or near the pull tabs on each cable.
 - If your system and EMX0 PCIe3 expansion drawer are in the same rack and the system uses a cable management bracket, use the 2-meter cables.
 - If your system and EMX0 PCIe3 expansion drawer are in the same rack and the system uses a cable management arm, use the 3-meter cables.
 - If your system and EMX0 PCIe3 expansion drawer are in separate racks, use the 10-meter cables.
 - If you have a POWER9 processor-based 9080-HEX system and the EMX0 PCIe3 expansion drawer is in a separate rack, you might need to use the 20-meter cables.
 - If you have a POWER8 processor-based 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system and the EMX0 PCIe3 expansion drawer is in a separate rack, you might need to use the 20-meter cables.
2. If the system has a rear cover, remove or open it.
3. Carefully remove the expansion drawer cable pair from the packaging. Do not remove the protective covers now.

Routing, connecting, and activating the expansion drawer cable pair or pairs

To route, connect, and activate the expansion drawer cable pair or pairs, complete the steps in this procedure.

About this task

Note: During the steps in this procedure, route the expansion drawer cables but do not connect them to the host system or the EMX0 PCIe3 expansion drawer until you are told to do so.

Important: To avoid damage to the connectors on the expansion drawer cables, do not remove the protective covers until just before you need to plug the cable into the host system or the EMX0 PCIe3 expansion drawer.

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. Select from the following options:
 - If you are working on a POWER9 processor-based 9080-M9S system or a POWER8 processor-based 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system, you must label the cables. Continue with step [“3” on page 19](#).
 - If you are **not** working on a POWER9 processor-based 9080-M9S system or a POWER8 processor-based 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system, continue with step [“10” on page 21](#).
3. Locate the following items that you need later in the procedure:
 - Expansion drawer cable pairs
 - Host system label sheet
 - EMX0 PCIe3 expansion drawer label sheet
 - Labeling diagram
4. Attach the host system location labels to the expansion drawer cable.

While you are completing these steps, refer to the following figure as a reference.

- a) Locate the host system **(A)** that you are attaching to the EMX0 PCIe3 expansion drawer.
- b) Locate the host system serial number label sheet **(B)**.
- c) Match the host system serial number **(C)** to the serial number shown on the host system label sheet.
- d) Determine the location of the cable adapter on the host system where you attach the first expansion drawer cable pair.
- e) Locate the labels on the host system label sheet **(B)** that correspond to the location of the cable adapter on the host system.
- f) Select one of the expansion drawer cables as the top cable **(D)** that you will attach to port T1.
- g) Attach the leftmost Cx-T1 label to the connector end of the cable **(E)**.
Wrap the label with the blank end first so that the location information **(F)** is visible.
- h) Take the second label Cx-T1 from the host system label sheet **(B)** and place it on the opposite end of the cable that attaches to the EMX0 PCIe3 expansion drawer. Ensure that the label is placed more than 100 mm (4 in) from the end of the cable **(G)**.
- i) Leave the cable near where it will be plugged.
- j) Route the other end of the cable to the EMX0 PCIe3 expansion drawer to which it attaches.
- k) Leave the cable near where it will be plugged.

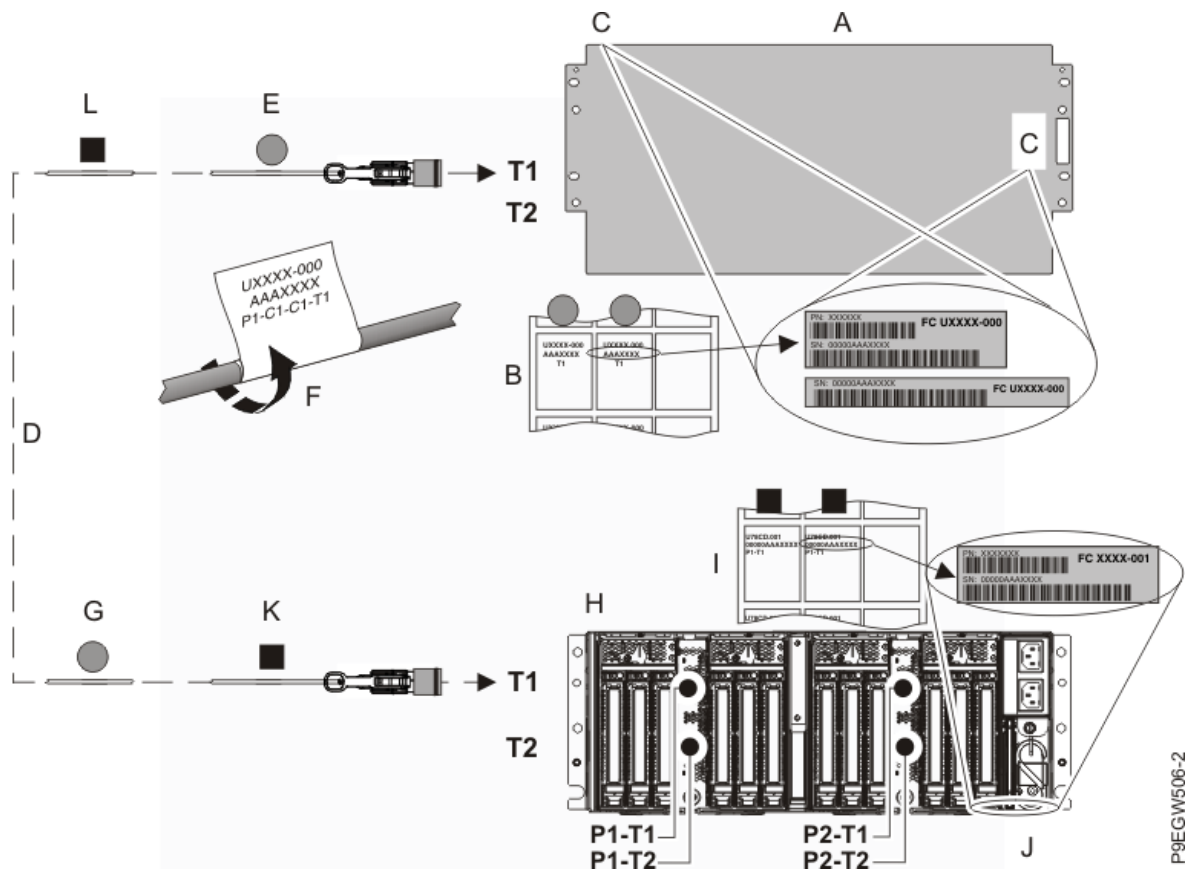


Figure 15. Labeling an expansion drawer cable

5. Attach the EMX0 PCIe3 expansion drawer location labels to the expansion drawer cable:
 - a) Locate the EMX0 PCIe3 expansion drawer **(H)** that you are connecting to the host system.
 - b) Locate the EMX0 PCIe3 expansion drawer serial number label sheet **(I)**.
 - c) Match the EMX0 PCIe3 expansion drawer serial number **(J)** to the serial number shown on the EMX0 PCIe3 expansion drawer label sheet **(I)**.

- d) Determine the location of the I/O module on the EMX0 PCIe3 expansion drawer where you will attach the first cable pair.
 - e) Locate the labels on the EMX0 PCIe3 expansion drawer label sheet that correspond to the I/O module location.
 - f) Attach the leftmost Px-T1 label to the connector end of the cable **(K)**.
Wrap the label with the blank end first so that the location information **(F)** is visible.
 - g) Take the second Px-T1 label from the expansion drawer label sheet and place it on the opposite end of the cable greater than 100 mm (4 in) from the end of the cable **(L)**.
 - h) Select the top cable that will be attached to port P1-T1.
 - i) Leave the cable near where it will be plugged.
6. Place and route the labeled cable:
- Remember:** Do not connect the cable now.
- a) Locate the connector end of the cable with the host system Cx-T1 label **(E)** and place it near the T1 port on the cable adapter on the host system.
Record this port for later.
 - b) Route the cable and place the connector end **(K)** near the I/O module on the EMX0 PCIe3 expansion drawer.
7. Repeat steps [“4” on page 19](#) - [“6” on page 21](#) for the other cable pair.
8. If you need to label and route more cable pairs, repeat steps [“4” on page 19](#) - [“7” on page 21](#).
9. Continue with step [“11” on page 21](#).
10. If you did not label the cables, follow these steps to place and route the expansion drawer cables:
- Remember:** Do not connect the cable now.
- a) Place the connector end of one of the expansion drawer cables near the T1 port on the cable adapter on the host system. Record this port for later.
 - b) Route the cable and place the opposite connector end near the I/O module on the EMX0 PCIe3 expansion drawer.
 - c) Repeat this step for the other cable in the pair and for other cable pairs.
11. Refer to the following options to determine if you can connect and activate the expansion drawer cables when the system power is turned on:
- If you have a POWER9 processor-based 9040-MRX or 9080-M9S system or a POWER8 processor-based 8408-44E with system firmware FW860.10 or later installed, or 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME with system firmware FW840.xx or later installed and you want to activate the link with the system power turned on, continue with step [“12” on page 21](#).
 - If you do **not** meet the criteria to connect and activate the expansion drawer cable when the system power is turned on, or you want to activate the link with the system power turned off, continue with step [“14” on page 23](#).
12. To connect the expansion drawer cables and activate the link with the **system power turned on**, complete the following steps:
- a) Connect the power cables for the EMX0 PCIe3 expansion drawer, by completing the following steps:
 - i) Connect the power cables into the power source.
Important: Ensure that you plug the power cables into the power source before you connect them into the power supply of the EMX0 PCIe3 expansion drawer.
 - ii) Route the power cables through the s-carabiner so that the cables clear the PCIe3 6-slot fanout module or modules.

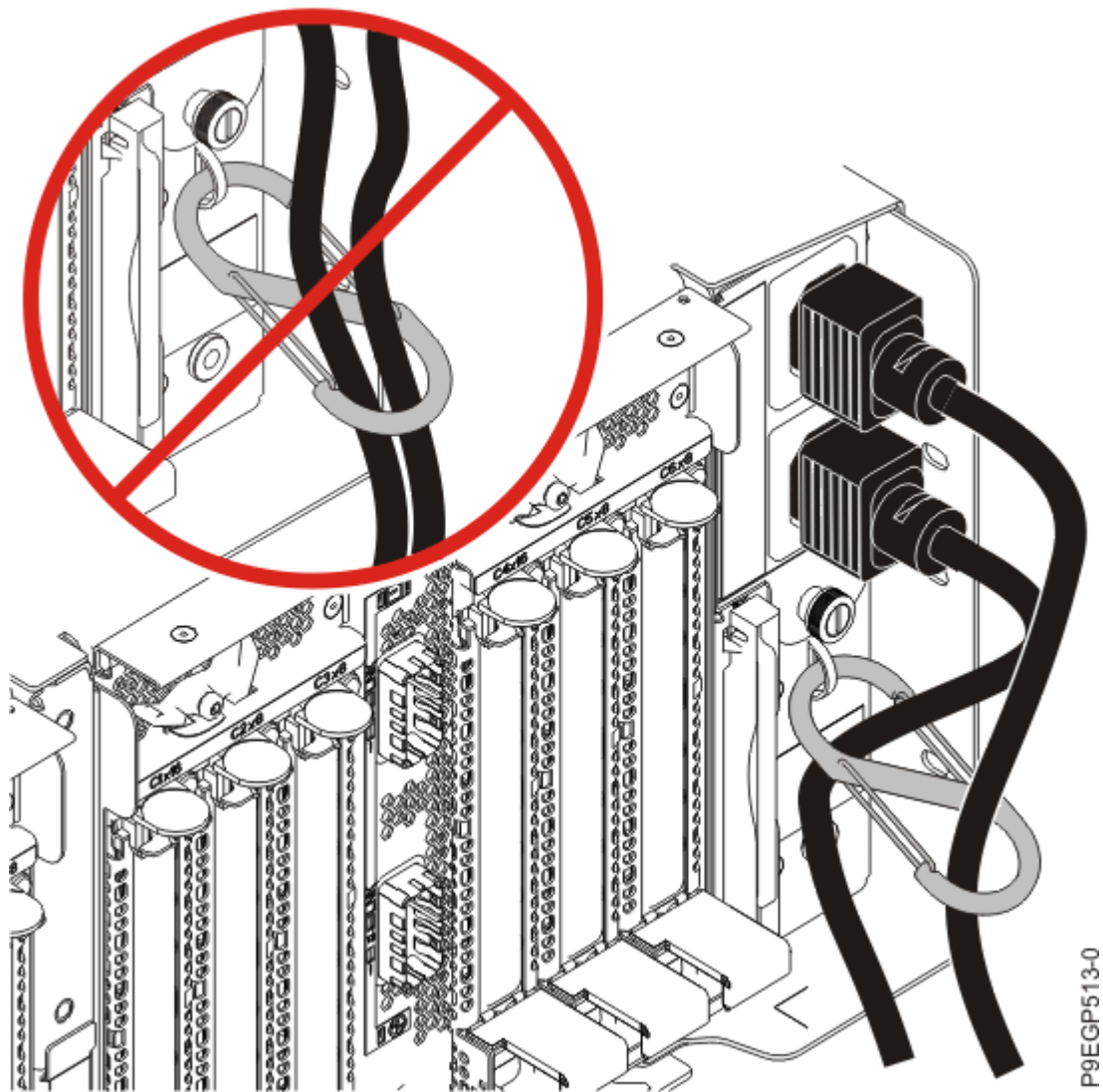


Figure 16. Routing the power cables through the s-carabiner and connecting them to the power supply

- iii) Connect the other ends of the power cables into the power supplies on the EMX0 PCIe3 expansion drawer you are installing.
- b) Connect the expansion drawer cables and activate the link with the system power turned on, by completing the following steps:
 - i) From the HMC navigation area, click the **Resources** icon and then click **All Systems**.
 - ii) Click the system name for which you want to connect an EMX0 PCIe3 expansion drawer.
 - iii) Select **Serviceability** > **Add FRU** > **PCIe Connection**.
 - iv) Select the PCIe3 cable adapter you recorded earlier that you want to connect first. It is the cable that is located near connector **T1** on the PCIe3 cable adapter in the host system.
 - v) Start the procedure and follow the on-screen instructions.

Note: If you arrived to this point by selecting **Serviceability** > **Add Enclosure**, a message is displayed that another service action is active on this system. Click **Proceed** even though the message indicates that doing so is not recommended.

13. Continue with step “15” on page 23.

Note: If you are using the HMC panels, they will show the remaining procedure. If you want, you can look at them here to become familiar with the steps.

14. If you did not meet the criteria to activate the PCIe link with the system power on, or you want to activate the link when the system power is turned off, complete the following steps:
 - a) Record the current date and time. You need it when you power on the system when you are checking for serviceable events.
 - b) If the system is not already powered off, turn off the system.
For instructions, see [Stopping a system](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustopsys.htm) (www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustopsys.htm).
15. To connect the expansion drawer cables to the cable adapter ports on the host system and to a PCIe3 6-slot fanout module on the EMX0 PCIe3 expansion drawer, complete the following steps:
 - a) Determine the first expansion drawer cable that you connect. It is the cable that is located near connector **T1** on the cable adapter in the host system that you recorded earlier
 - b) Remove the protective cover from the connector on the expansion drawer cable.
 - i) Hold the cable housing (**B**) on the short edges with the index finger and thumb on one hand.
 - ii) Then, grasping the cover on the long edge (**A**) with the index finger and thumb on your other hand, pull off the protective cover as shown in the following figure.

Note: Keep your fingers close to the closed end of the protective cover.

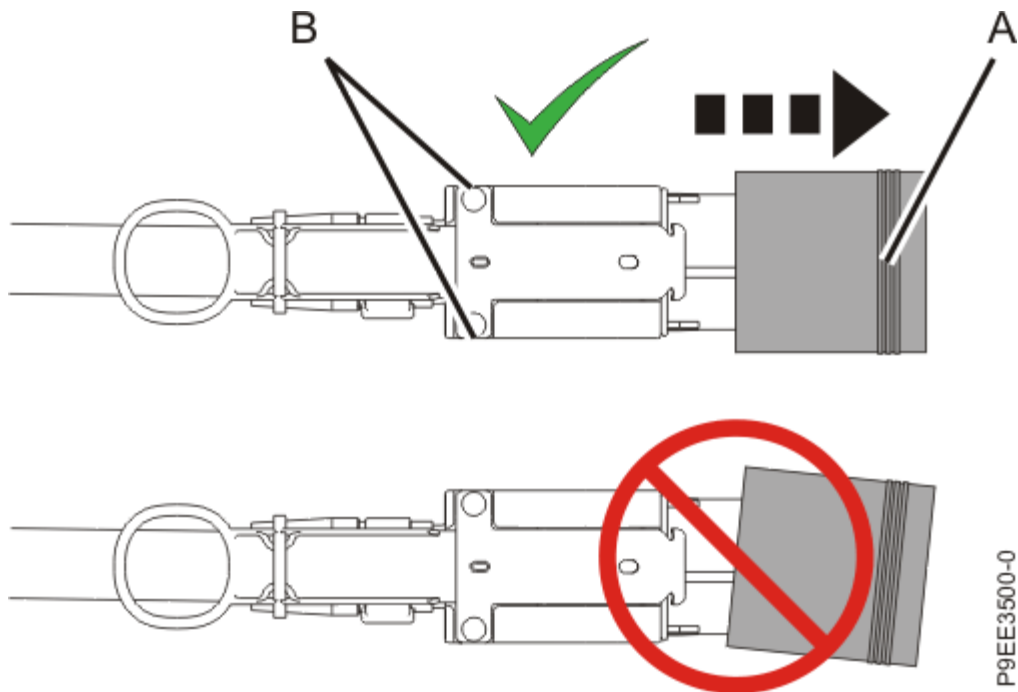


Figure 17. Removing the protective cover from the connector on the expansion drawer cable

- c) Connect the expansion drawer cable into the **T1** connector on the cable adapter in the host system.
- d) Remove the protective cover and connect the cable that is located near connector **T2** on the cable adapter in the host system.
- e) Remove the protective cover and connect the other end of the expansion drawer cable that is located near connector **T1** on the PCIe3 6-slot fanout module in the EMX0 PCIe3 expansion drawer.
- f) Remove the protective cover and connect the other end of the expansion drawer cable that is located near connector **T2** on the PCIe3 6-slot fanout module in the EMX0 PCIe3 expansion drawer.

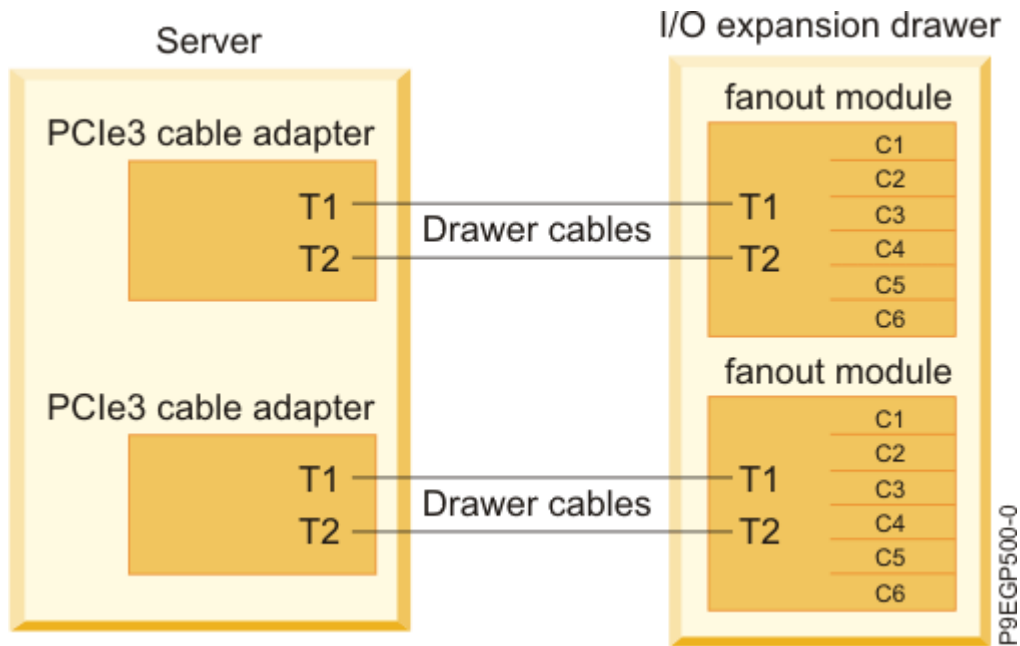


Figure 18. Connecting the expansion drawer cables

16. If you have another pair of cables to connect, repeat step [“15” on page 23](#).

17. Choose from the following options:

- If you connected the expansion drawer cables with the system power turned off, continue with step [“18” on page 24](#).
- If you left the system power turned on, continue with step [“19” on page 25](#).

18. Connect the power cables for the EMX0 PCIe3 expansion drawer, by completing the following steps:

a. Connect the power cables into the power source.

Important: Ensure that you plug the power cables into the power source before you connect them into the power supply of the EMX0 PCIe3 expansion drawer.

b. Route the power cables through the s-carabiner so that the cables clear the PCIe3 6-slot fanout module or modules.

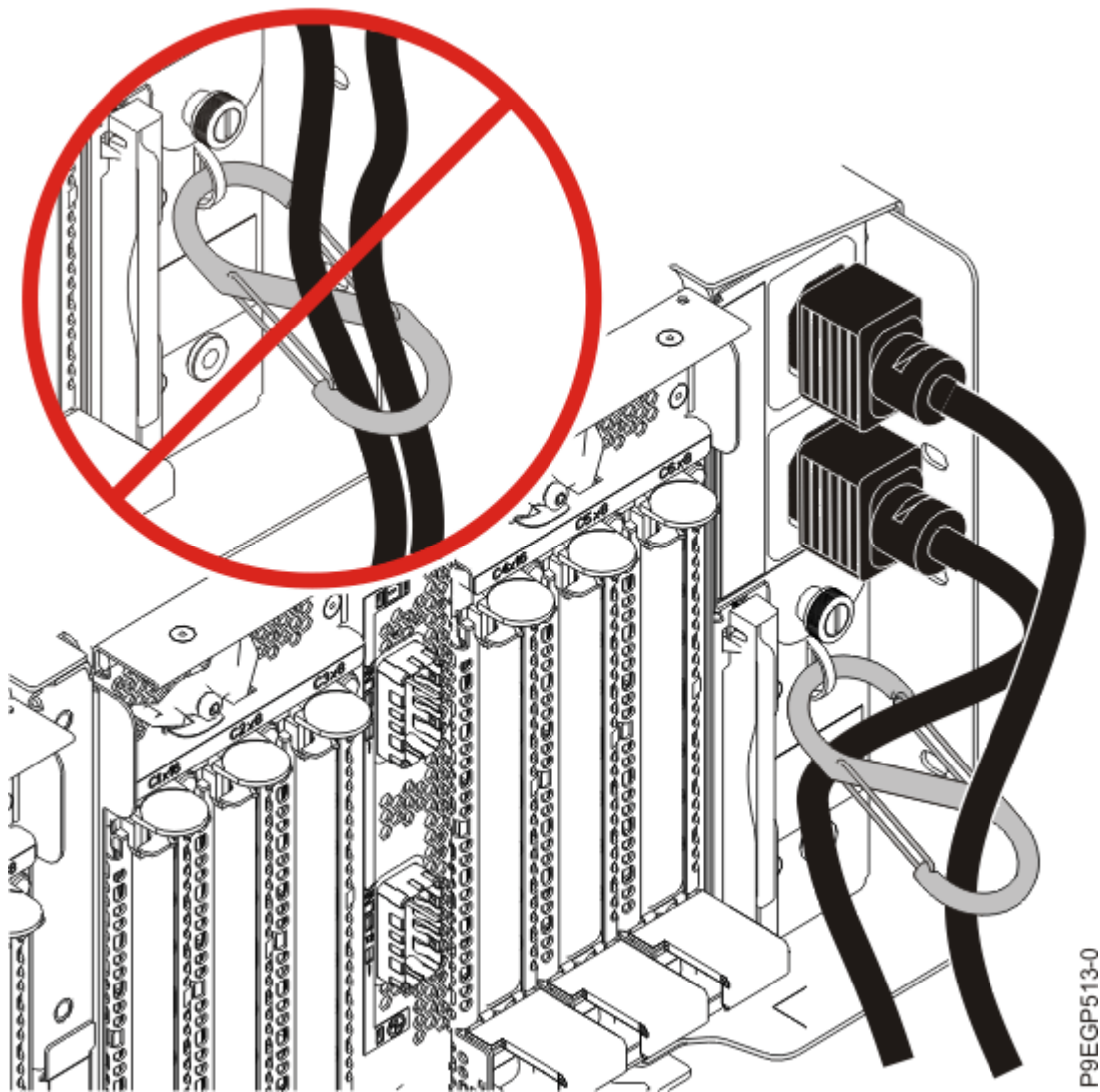


Figure 19. Routing the power cables through the s-carabiner and connecting them to the power supply

- c. Connect the other ends of the power cables into the power supplies on the EMX0 PCIe3 expansion drawer you are installing.
19. If necessary, route the cables for the PCIe adapters and expansion drawer into the cable management bracket or cable management arm and attach the cables correctly by using the hook-and-loop fastener strips.

Notes:


- If you have a cable management bracket, ensure that it is in the highest possible position so the cables have plenty of clearance to move to the lowest position.
 - If you have a cable management arm, you might want to put the system in the service position when you route the cables to ensure there is plenty of clearance.
20. Choose from the following options:
 - If you connected the expansion drawer cables with the system power turned off, continue with step [“21” on page 25](#).
 - If you left the system power turned on, continue with step [“24” on page 27](#).
 21. If you connected the expansion drawer cables with the system power turned off, you will need to power on the system to firmware standby state and check for serviceable events. Then, you will need

to turn on the system to the operating or running state to activate the PCIe connection. Choose from the following options:


- If your system is managed by an HMC, continue with step “22” on page 26.
- If your system is **not** managed by an HMC, use the Advanced System Management Interface (ASMI), continue with step x.

22. If you are using an HMC, complete the following steps:



- a) In the navigation area, click the **Resources** icon , and then select **All Systems**.
- b) In the content pane, select the name of the system to view the actions for that system.
- c) To enable the system to power on to the firmware standby state, complete the following steps:
 - i) In the navigation area, select **Properties > Other properties**.
 - ii) Select the **Power-On Parameters** tab.
 - iii) Record the current setting for the **Partition start policy** field so that you can restore the setting later in this procedure.
 - iv) Set the **Partition start policy** field to **User-Initiated**. Click **OK**.
- d) In the navigation area, select **System Actions > Operations > Power on** and click **OK**.
- e) In the content area, observe the system that you are working with until the value in the Status column changes to Standby.
- f) To reset the **Partition start policy** field to its original value, complete the following steps:
 - i) In the navigation area, select **Properties > Other properties**.
 - ii) Select the **Power-On Parameters** tab.
 - iii) Set the **Partition start policy** field to the value that you recorded earlier.
- g) To start any logical partitions that are currently stopped by using an HMC, complete the following steps:



- i) In the navigation area, click the **Resources** icon , and then click **All Systems**.
 - ii) Click the system name in which you want to activate the logical partition.
 - iii) Select the logical partition name that you want to activate.
 - iv) In the navigation area, click **Actions > Activate**.
 - v) Click **Finish**.
 - h) Continue with step “24” on page 27.
23. If you are using an ASMI, complete the following steps:
- a) Access the ASMI by using an authority level of administrator or authorized service provider.
 - b) In the ASMI navigation area, expand **Power/Restart Control**.
 - c) Click **Power On/Off System**.
 - d) Record the current setting for the **Server firmware start policy** field so that you can restore the setting later in this procedure.
 - e) Set the **Server firmware start policy** field to **Standby (User-Initiated)**.
 - f) Click **Save settings and power on**.
 - g) Periodically, click **Power On/Off System** again to refresh the information on the display until the value of the **Current system firmware state** field changes to Standby.
 - h) To reset the **Server firmware start policy** field to its original value, complete the following steps:
 - i) In the ASMI navigation area, expand **Power/Restart Control**.
 - ii) Click **Power On/Off System**.

i) If you are not using an HMC, power on the system to running state by choosing one of the following options:

- Power on one or more logical partitions. For instructions, see [Starting a system or logical partition](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustart.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustart.htm>).

Notes:

- If you start a partition while the system is in the standby state, the system changes from the standby state into the operating or running state.
- This option is only available if you have an HMC.
- Power off the system and then power it back on. For instructions, see [Stopping a system or logical partition](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustop.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustop.htm>) and [Starting a system or logical partition](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustart.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/crustart.htm>).

24. You have completed the steps to route, connect, and activate the PCIe link for the expansion drawer cable.

Preparing your system for operation after connecting an EMX0 PCIe3 expansion drawer to your system

To prepare your system for operation, complete the steps in this procedure.

Procedure

1. If the system has a rear door, close or replace it.
2. Verify that the system or logical partition recognized the EMX0 PCIe3 expansion drawer.
To verify that the system or logical partition recognizes the disk drive enclosure, see [Verifying the installed part](http://www.ibm.com/support/knowledgecenter/POWER10/p10haj/pxhaj_hsmverify.htm) (www.ibm.com/support/knowledgecenter/POWER10/p10haj/pxhaj_hsmverify.htm).
3. If the system has logical partitions, you can now assign I/O slots in the expansion drawer that was added to the logical partitions.
For instructions, see [Managing physical I/O devices and slots dynamically](http://www.ibm.com/support/knowledgecenter/POWER10/p10hat/p10hat_dlpriopp6.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10hat/p10hat_dlpriopp6.htm).
4. You have completed the steps to install an EMX0 PCIe3 expansion drawer.
If you were directed here from another procedure, return to that procedure now.

Connector locations

Learn about connector locations for the EMX0 PCIe3 expansion drawer and the host systems that it can attach to.

Connector locations for the EMX0 PCIe3 expansion drawer

Learn about connector locations for the EMX0 PCIe3 expansion drawer.

The EMX0 PCIe3 expansion drawer is connected to the host system from the cable adapter on the server to the PCIe3 6-slot fanout module on the EMX0 PCIe3 expansion drawer.

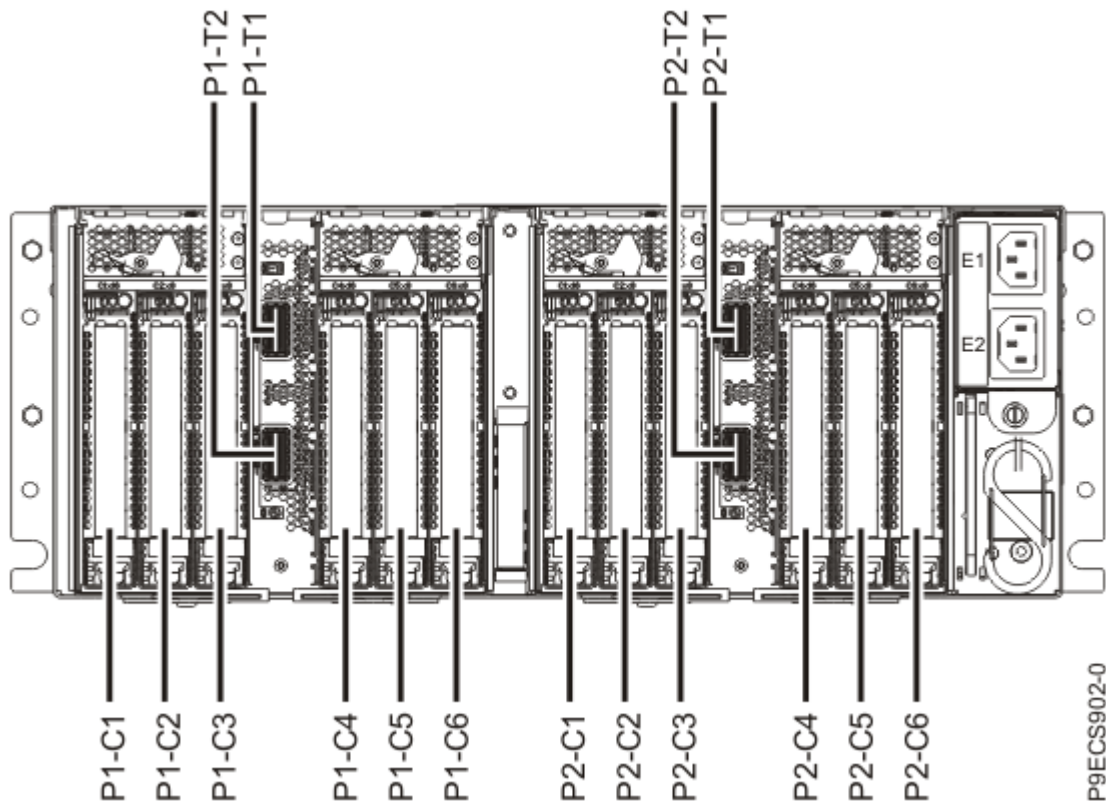


Figure 20. EMX0 PCIe3 expansion drawer showing the left and right PCIe3 6-slot fanout module and top (T1) and bottom (T2) expansion drawer cable connectors

For more information about the EMX0 PCIe3 expansion drawer locations, see [EMX0 PCIe3 expansion drawer locations](http://www.ibm.com/support/knowledgecenter/POWER10/p10ecs/p10ecs_emx0_loccodes.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10ecs/p10ecs_emx0_loccodes.htm).

For more information about the server locations, see [Part locations and location codes](http://www.ibm.com/support/knowledgecenter/POWER10/p10ecs/p10ecs_locations.htm) (http://www.ibm.com/support/knowledgecenter/POWER10/p10ecs/p10ecs_locations.htm).

Connector locations for Power 10 servers

Learn about connector locations for Power 10 servers.

Connector locations for the 9105-22A, 9105-22B, and 9786-22H systems

Learn about connector locations for the 9105-22A, 9105-22B, and 9786-22H systems.

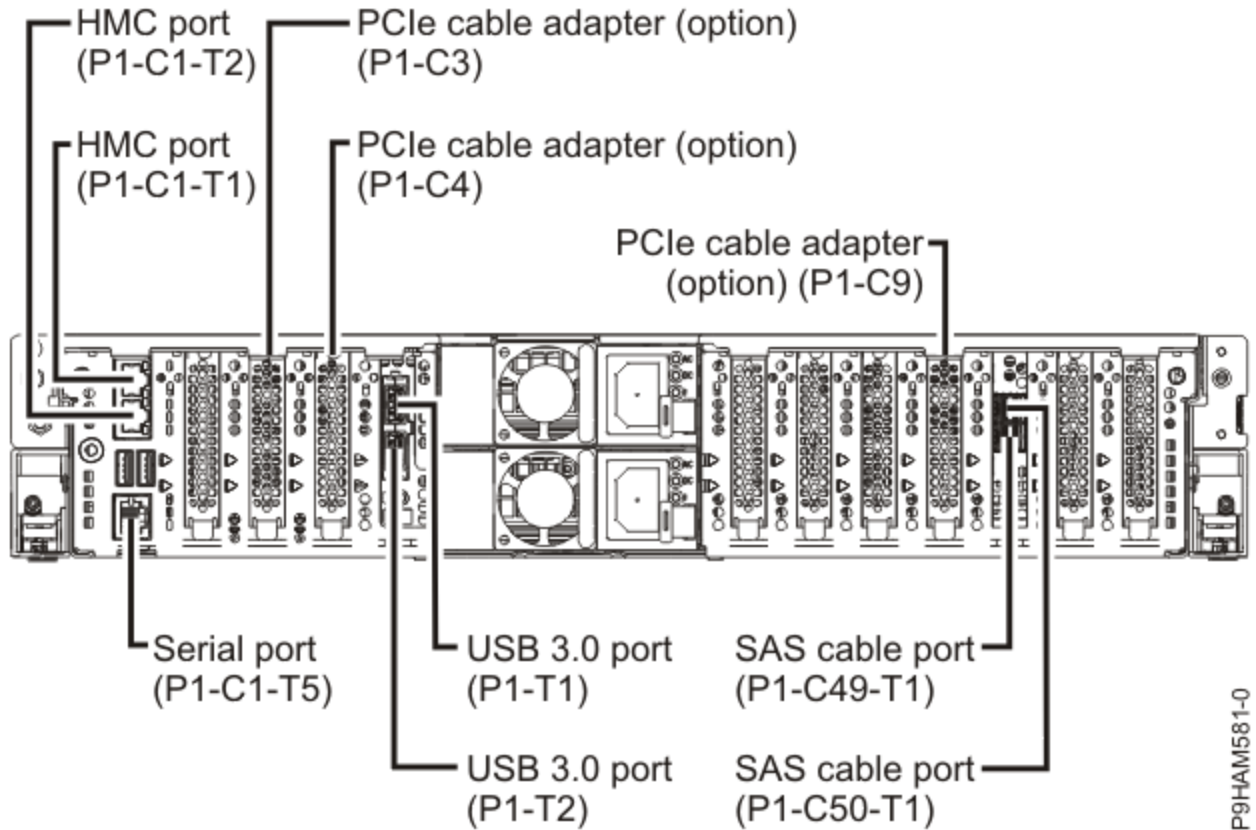


Figure 21. Connector locations for the 9105-22A, 9105-22B, and 9786-22H systems

Connector locations for the 9105-41B, 9105-42A, 9105-42B, and 9786-42H systems

Learn about connector locations for the 9105-41B, 9105-42A, 9105-42B, and 9786-42H systems.

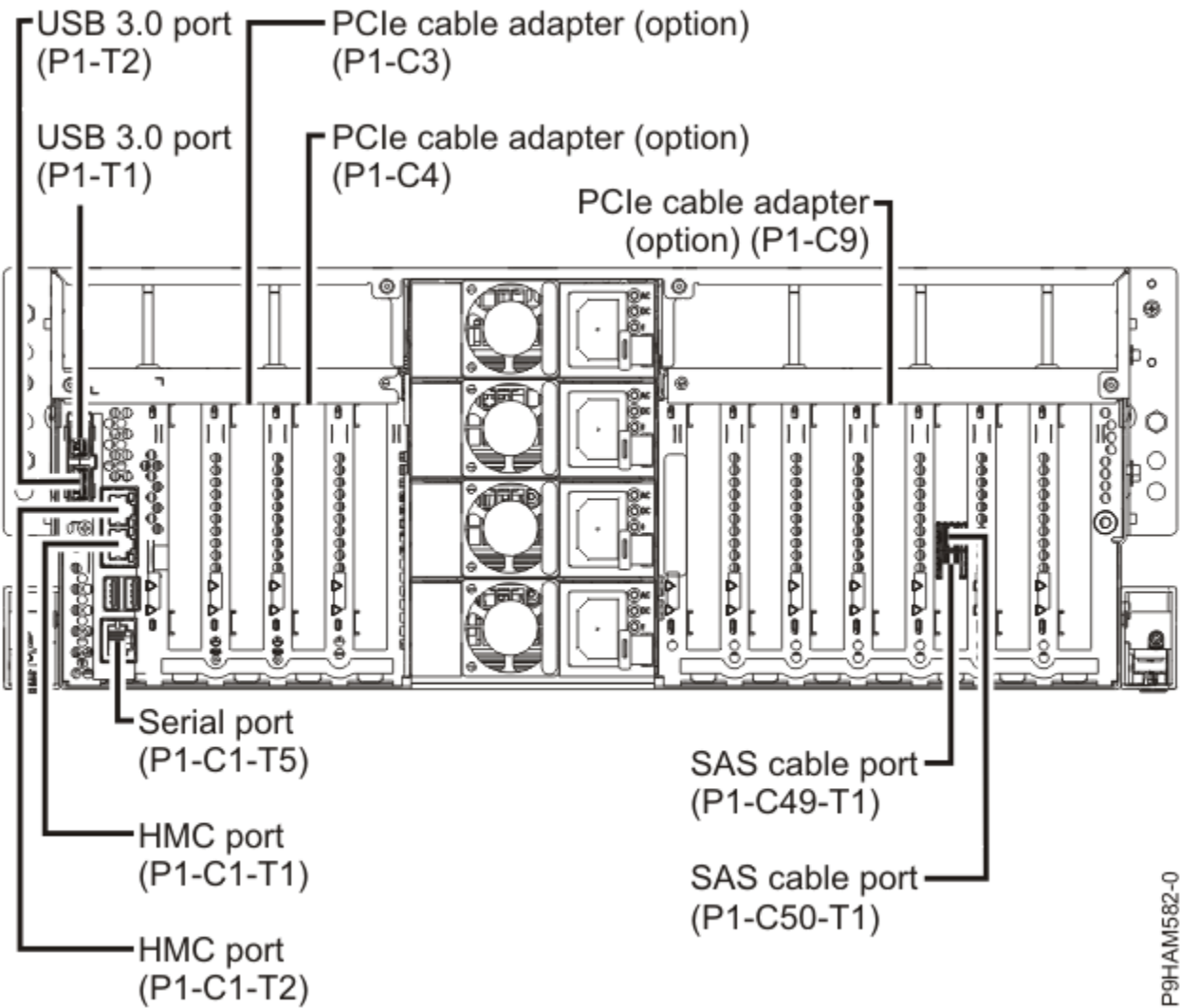


Figure 22. Connector locations for 9105-41B, 9105-42A, 9105-42B, and 9786-42H systems

Connector locations for the 9040-MRX and 9781-50H systems

Learn about connector locations for the 9040-MRX and 9781-50H systems.

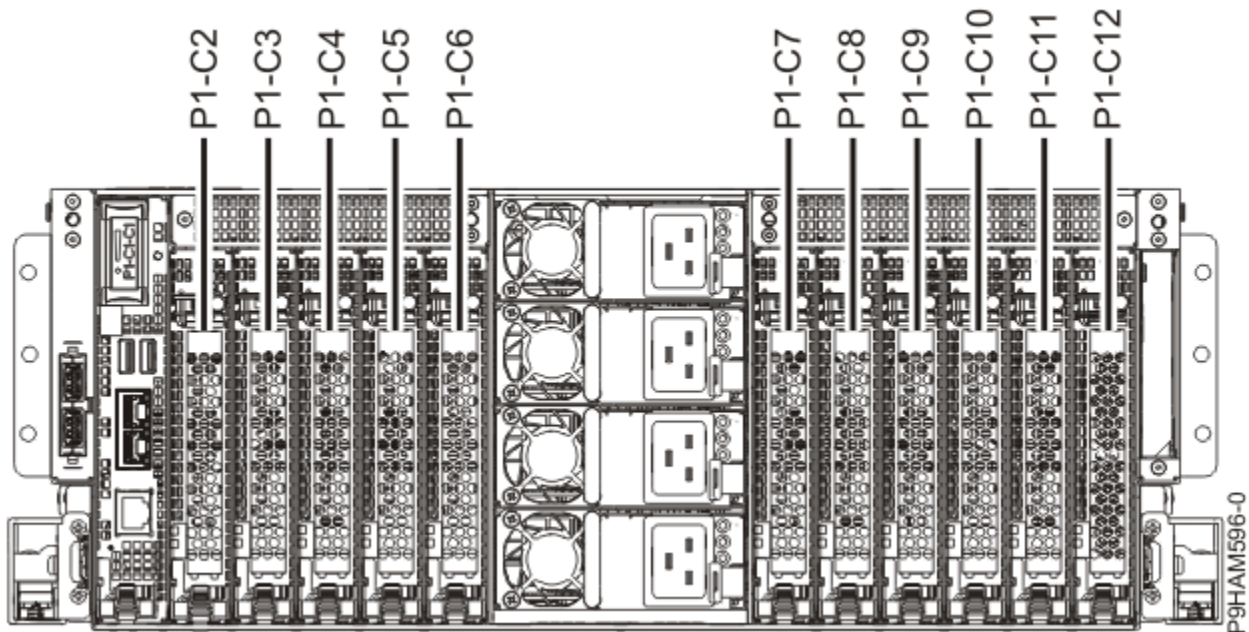


Figure 23. Rear view of the 9040-MRX or 9781-50H system

Table 1 on page 32 shows the slots that must be used to install a SAS RAID controller in the 9040-MRX or 9781-50H system for controlling the internal SAS disk drive bays.

Table 1. SAS RAID controller slots for the 9040-MRX or 9781-50H system	
SAS RAID controller	Slot
PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (FC EJ0K; CCIN 57B4)	P1-C12
PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (two FC EJ0K; two CCIN 57B4)	P1-C9 and P1-C12
Note: The C9 and C12 slots are used for controlling the internal SAS disk drive bays and have limited availability for attaching a 5887 disk drive enclosure or an ESLS storage enclosure.	

For more information about FC EJ0K, see [PCIe3 RAID SAS quad-port 6 Gb adapter \(FC EJ0K; CCIN 57B4\)](http://www.ibm.com/support/knowledgecenter/POWER10/p10hcd/fcej0k.htm) (<http://www.ibm.com/support/knowledgecenter/POWER10/p10hcd/fcej0k.htm>).

Table 2 on page 33 shows the slot priorities for the FC EJ0K adapter in the 9040-MRX or 9781-50H system.

Table 2. Slot priorities for the FC EJ0K

Feature code	Description	Slot priorities for two processors	Slot priorities for three processors	Slot priorities for four processors	Maximum number of adapters supported
EJ0K	PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (FC EJ0K; CCIN 57B4)	12, 9, 11, 8, 10, 7	12, 9, 11, 8, 5, 10, 7, 4	12, 9, 11, 8, 5, 3, 10, 7, 4, 2	6/8/10

Note: The C9 and C12 slots are used for controlling the internal disk drive bays and have limited availability for attaching a 5887 disk drive enclosure or an ESLS storage enclosure.

Table 3 on page 33 shows the cable adapter slots and priorities for the 9040-MRX or 9781-50H system. The cable adapter is used to connect your system to the PCIe3 6-slot fanout module in your EMX0 PCIe Gen3 I/O expansion drawer.

Table 3. PCIe3 cable adapter slots and priorities

Feature code	Description	Slot priorities for two processors	Slot priorities for three processors	Slot priorities for four processors	Maximum number of adapters supported
EJ08	PCIe to optical CXP converter adapter (FC EJ08; CCIN 2CE2); Adapter part number: 041T9901	11, 8 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8

Connector locations for the 9080-HEX system

Learn about connector locations for the 9080-HEX system.

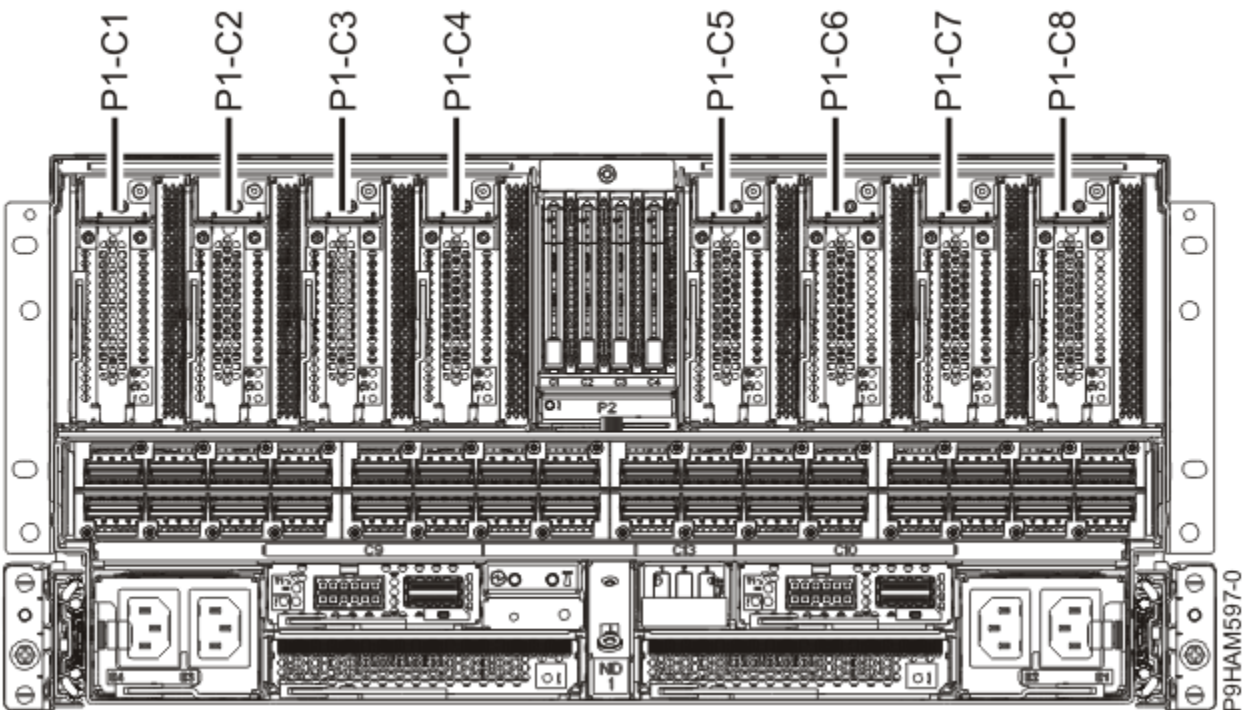


Figure 24. Rear view of the 9080-HEX system

Table 4 on page 34 shows the slot priorities for the FC EJ0M and EJ14 adapters, which support the attachment of SAS hard disk drives (HDDs) and solid-state devices (SSDs) in the 9080-HEX system.

Table 4. Slot priorities for FC EJ0M and FC EJ14 adapters			
Feature code	Description	Slot priorities	Node max
EJ0M	PCIe3 SAS RAID quad-port 6 Gb LP adapter (FC EJ0M and FC EL3B; CCIN 57B4); Adapter part number: 000MH910	2, 4, 6, 3, 5, 7, 1, 8	8
EJ14	PCIe3 12 GB Cache RAID PLUS SAS adapter quad-port 6 Gb x8 (FC EJ14; CCIN 57B1); Adapter part number 01DH742	1, 3, 5, 7, 2, 4, 6, 8	8

Table 5 on page 35 shows the PCIe cable adapter slots and priorities for the 9080-HEX system.

<i>Table 5. PCIe3 cable adapter slots and priorities</i>			
Feature code	Description	Slot priorities	Node max
EJ07	PCIe3 cable adapter for the PCIe3 expansion drawer (FC EJ07; CCIN 6B52); Adapter part number: 00TK704	1, 7, 3, 5, 2, 8, 4, 6	8

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- Operations that use a screen reader

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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, NY 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

CAN ICES-3 (B)/NMB-3(B)

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

German Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

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

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

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

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 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、P F C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、P F C回路付)
- 換算係数 : 0

Japan Voluntary Control Council for Interference (VCCI) Notice

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取扱説明書に従って正しい取り扱いをして下さい。

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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Part Number: 03KG302

GI11-9914-09



(1P) P/N: 03KG302

