ESCALA

Installing systems and expansion units into a rack

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Installing systems and expansion units into a rack

Hardware

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

German safety information

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

Laser safety information

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

Laser compliance

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

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

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

(C026)

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

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

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

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

Chapter 1. Racks, rack features, and installing systems or expansion units into a rack

Learn about the procedures used to install racks. Also detailed procedures are provided for installing rack features, systems and expansion units into a rack.

You can perform these tasks or contact a service provider to perform the tasks for you. You might be charged a fee by the service provider for this service.

Chapter 2. Installing the rack

This section describes all the tasks required to install 7014-T00, 7014-T42, 0551, or 0553 racks. The full spectrum of related tasks are described, from doing a parts inventory to finally connecting to a dc power source.

Installing the 7014-T00, 7014-T42, 0551, or 0553 racks

This section describes all the tasks required to install racks. The full spectrum of related tasks are described, from doing a parts inventory to finally connecting to a dc power source.

If you are installing a rack security kit in this rack, see Chapter 6, “Installing the rack security kit,” on page 99 after you have installed the rack.

Before installing a rack, read the “Rack safety notices” on page 96.

Completing a parts inventory

Before beginning the rack installation it is a good idea to do a parts inventory. This section guides you in performing this task.

If you have not done so, complete a parts inventory before installing the unit in the rack:

1. Locate the kitting report in an accessory box.
2. Ensure that you received all of the features that you ordered and all of the parts on the kitting report.

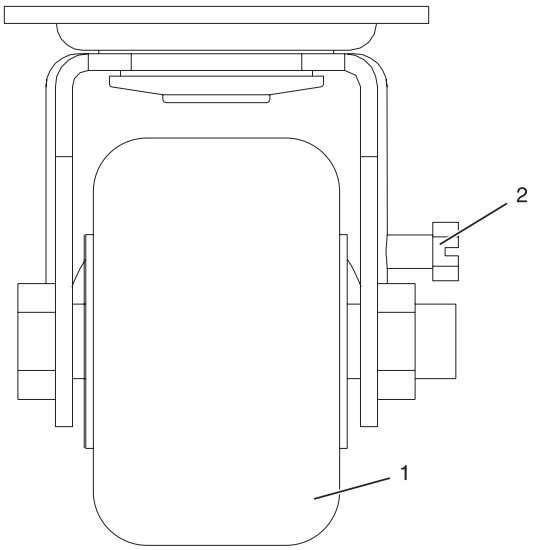
If there are incorrect, missing, or damaged parts, contact:

- Your IBM reseller
- IBM support (see Directory of worldwide contacts Web site at http://www.ibm.com/planetwide for contact information for your country)
- IBM Rochester Manufacturing Automated Information Line at 1–800–300–8751 (United States only)

Positioning the rack

Proper rack positioning is needed to comply with safety and regulatory requirements. Use the procedure in this section to perform this task.

After the rack has been placed into its location on the floor, lock each caster by tightening the locking screw. See the following illustration for the locking screw location. Remove all of the tape and packing materials from the rack.



1 Caster
2 Locking screw

Figure 1. Tightening the locking screw

Use the following to determine the next step:

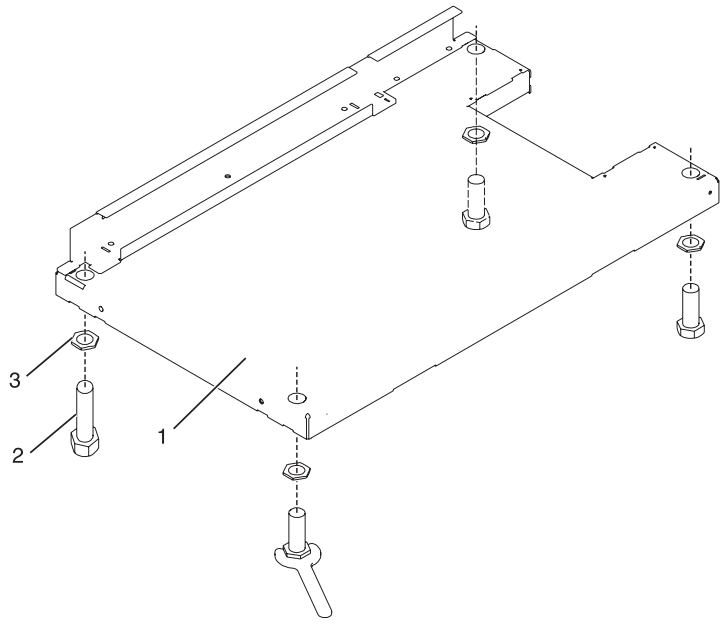
- If the rack is being bolted to a concrete floor, go to "Attaching the rack to a concrete floor" on page 6.
- If the rack is being bolted to a concrete floor beneath a raised floor, go to "Attaching the rack to the concrete floor beneath a raised floor" on page 11.
- If the rack is not being attached to the floor, go to "Leveling the rack."

Leveling the rack

If you need to level the rack, use the procedure described in this section.

To level the rack, complete the following steps:

1. Loosen the jam nut on each leveling foot.
2. Rotate each leveling foot downward until it contacts the surface on which the rack is placed.
3. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base.



1 Rack Front (base)
2 Leveling Foot (quantity 4)
3 Jam Nut (quantity 4)

Figure 2. Adjusting the leveling feet.

Attaching the stabilizer brackets

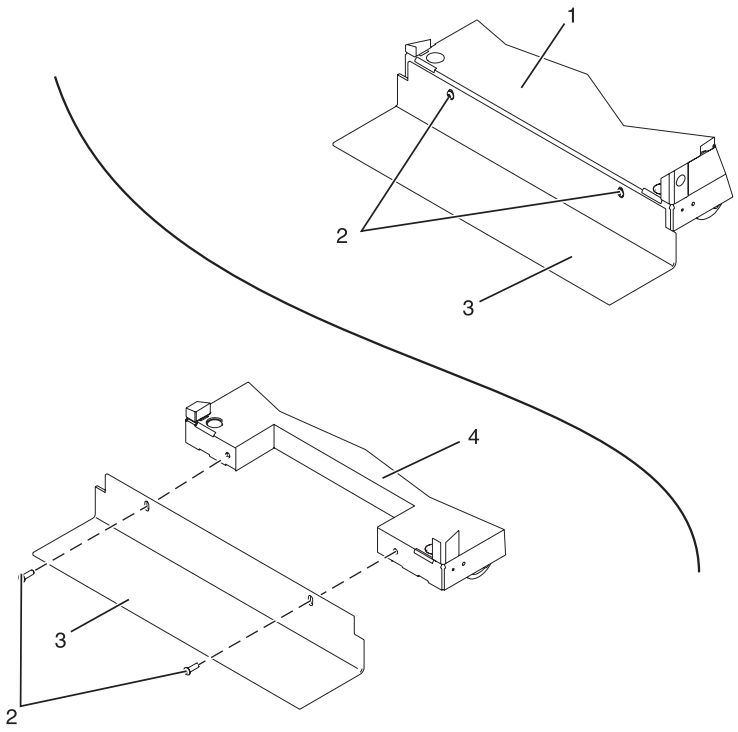
You might need to attach the stabilizer brackets to the rack. This section helps you determine whether stabilizer brackets are necessary and describes how to attach them if needed.

If the front or back ac electrical outlets are going to be installed in the rack, you cannot attach the stabilizer brackets. The rack must be bolted to the floor. Stabilizer brackets are used only if you will not be bolting the rack to the floor. If you are going to bolt the rack to the floor, go to "Attaching the rack to a concrete floor" on page 6.

To attach the stabilizer brackets to the bottom of the rack, do the following:

Note: Before installing the stabilizer brackets, see "Attaching the front or back ac electrical outlet" on page 16 for instruction on installing the ac outlet-mounting plates.

1. Align the slots of one of the stabilizer brackets with the mounting holes at the bottom front of the rack.
2. Install the two mounting screws.
3. Ensure that the base of the stabilizer bracket rests firmly on the floor. Use the Allen wrench that was supplied with the rack to tighten the mounting screws alternately until they are tight.



1 Rack front (base)
2 Stabilizer mounting screws
3 Stabilizer bracket
4 Rack rear (base)

Figure 3. Attaching the stabilizer brackets

4. To install the second stabilizer bracket on the back of the rack, repeat steps 1 through 3.

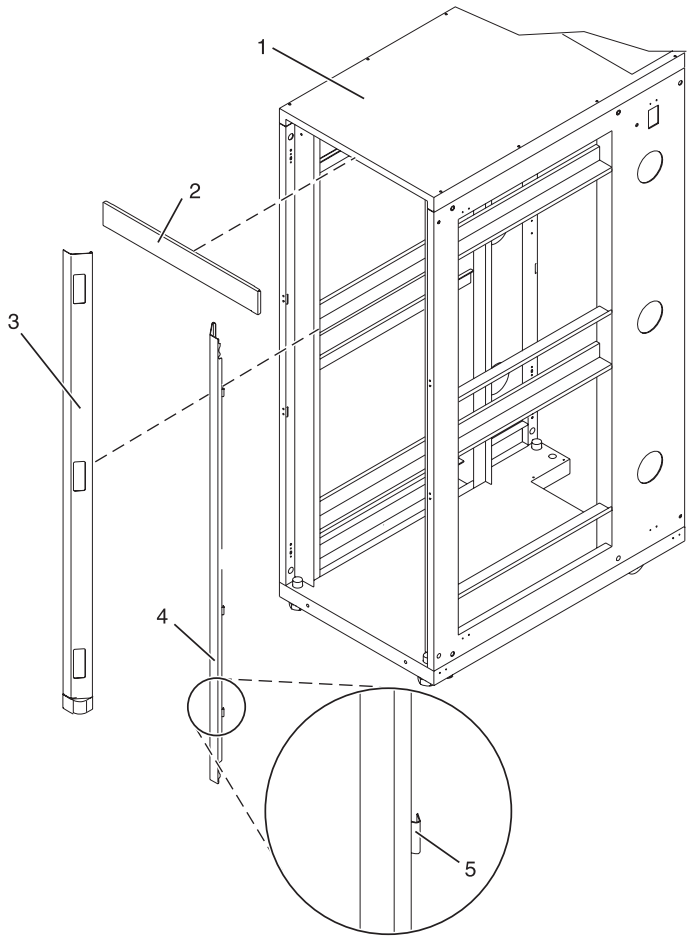
Attaching the rack to a concrete floor

If you plan to install the front or back ac electrical outlets in the rack, the rack must be bolted to the floor. This section describes how to perform this task for a concrete floor.

Obtain the services of a mechanical contractor to attach the rack-mounting plates to the concrete floor. The mechanical contractor must determine that the hardware being used to secure the rack-mounting plates to the concrete floor is sufficient to meet the requirements for the installation.

To attach the rack to a concrete floor, do the following:

1. Put the rack in its predetermined location, and tighten the locking screws on the casters.
2. If they are installed, remove the top, left, and right trim panels. The trim panels are held in place with spring clips. See the following illustration.



1 Rack chassis
2 Top trim panel
3 Left-side trim panel
4 Right-side trim panel
5 Spring clip

Figure 4. Removing the trim panels

3. If they are installed, remove the front and back doors. After the rack doors have been removed, go to the next substep. To remove a rack door:
   a. Unlock and open the door.
   b. Grasp the door firmly with both hands and pull it away from the hinges.
4. Locate the hardware mounting kit and the two mounting plates. Refer to the following illustration when reviewing the contents of the hardware mounting kit. The hardware mounting kit contains the following:
   - 4 Rack-mounting bolts
   - 4 Thin washers
   - 8 Plastic isolator bushings
   - 4 Thick washers
   - 4 Spacers
5. If you are installing an ac-powered rack, temporarily install the lower plastic isolator bushings to help you locate the mounting locations for the stabilizer bracket. After the stabilizer bracket has been

correctly located, remove the lower plastic isolator bushings.

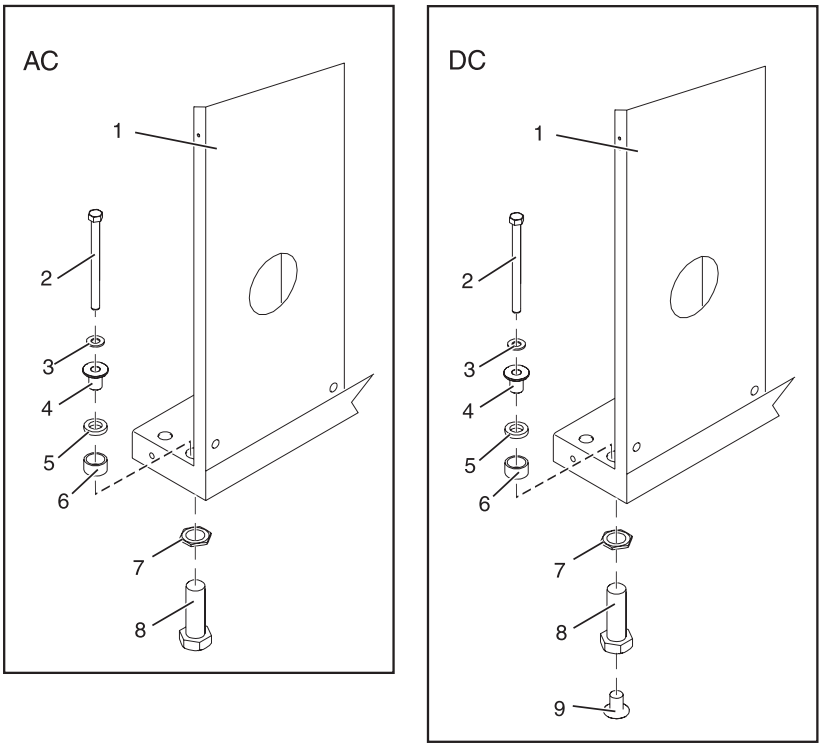
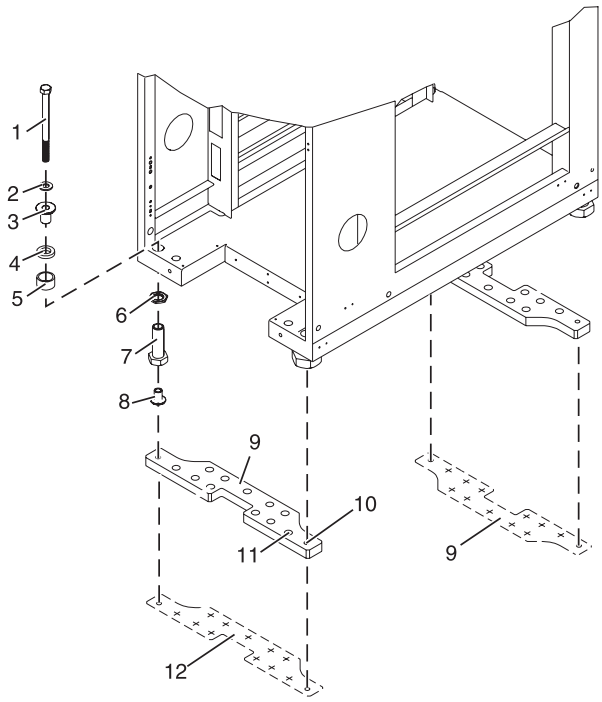


Figure 5. Installing ac-power mounting plates

1 Rack chassis
2 Rack-mounting bolt
3 Thin washer
4 Top plastic isolator bushing
5 Thick washer
6 Spacer
7 Jam nut
8 Leveling foot
9 Lower plastic isolator bushing (used only on dc powered systems)
AC Typical leveling foot installation for an ac-powered rack
DC Typical leveling foot installation for an dc-powered rack

6. Position the two mounting plates in the approximate mounting location under the rack.
7. Create a rack-mounting bolt assembly by adding the following items, in the order listed, to each rack-mounting bolt.
   a. Thin washer
   b. Top plastic isolator bushing
   c. Thick flat washer
   d. Spacer
8. Insert a rack-mounting bolt assembly through each of the leveling feet.
9. Reposition the rack-mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the threaded bolt holes.
10. Turn the rack-mounting bolts four complete turns into the mounting plate's threaded bolt holes.



1 Rack-mounting bolt
2 Thin washer
3 Top plastic isolator bushing
4 Thick washer
5 Spacer
6 Jam nut
7 Leveling foot
8 Lower plastic isolator bushing (Used only on dc powered systems)
9 Mounting plate
10 Threaded hole (Used to secure the rack to stabilizer bracket.)
11 Anchor bolt hole
12 Traced pattern (Pattern to be traced onto the floor using the stabilizer bracket as a template)

Figure 6. Securing the rack to the floor

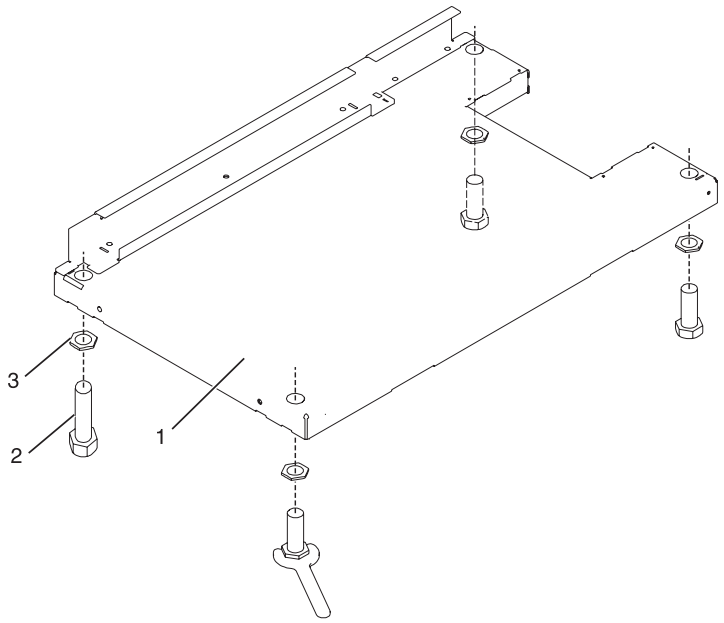
11. Mark the floor around the edges of both stabilizer brackets.
12. Mark the plate bolt-down holes that are accessible through the opening in the rear of the rack.
13. Remove the rack-mounting bolt assemblies.
14. If you are installing an ac-powered rack, remove the bottom isolator bushing from each of the leveling feet.
15. Remove the stabilizer brackets from the marked locations.
16. Loosen each of the locking screws on the casters.
17. Move the rack so that it is clear of both areas that were marked on the floor for the stabilizer bracket locations.
18. Reposition the stabilizer brackets within the marked areas.
19. Mark the floor at the center of all holes in both stabilizer brackets.
20. Remove the two rack-mounting plates from the marked areas.
21. At the marked location of the threaded rack-mounting bolt holes, drill four clearance holes into the concrete floor. Each clearance hole should be approximately 1-inch deep. This depth allows the rack-mounting bolts enough room to protrude past the thickness of the stabilizer brackets.

Note: You *must* use a minimum of two anchor bolts for each rack-mounting plate to securely attach the plate to the concrete floor. Because some of the holes in each rack-mounting plate might align with concrete reinforcement rods embedded in the concrete, some of the rack-mounting plate holes might not be usable.

22. Select at least two suitable hole locations for each stabilizer bracket bolt. The selected locations should be as close to the threaded bolt holes as possible. Be sure that the holes selected at the back of the rack are accessible. Drill holes at the selected locations into the concrete floor.
23. Position the stabilizer brackets over the concrete anchors.
24. Securely bolt the front stabilizer bracket to the concrete floor.
25. Position the stabilizer bracket over the concrete anchors.
26. Securely bolt the back stabilizer bracket to the concrete floor.

Note: The size of the anchor bolts and concrete anchors *must* be determined by the mechanical contractor who will be installing the rack-mounting plate.

27. Position the rack over the stabilizer bracket.
28. Insert each of the stabilizer bracket bolts through a flat washer, a plastic isolator bushing and a thick washer, and through a leveling foot.
29. Align the four stabilizer brackets bolts with the four tapped holes in the two mounting plates and turn three to four rotations.
30. Tighten the locking screw on each caster.
31. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base of the rack.



1 Rack front (base)
2 Leveling foot (quantity 4)
3 Jam nut (quantity 4)

Figure 7. Adjusting the leveling feet

32. If you have multiple racks that are connected in a suite (bolted to each other), go to Chapter 8, "Connecting multiple racks with rack-to-rack attachment kit," on page 107. Otherwise, torque the four bolts to 40-50 ft-lbs (54-67 nm).

33. If you are not installing doors on your rack, install the top, left, and right trim panel.
34. Connect the power distribution system as described in "Connecting the power distribution system" on page 15.
35. After all racks are bolted down, go to "Attaching the front or back ac electrical outlet" on page 16.
36. If you are not going to attach a front electrical outlet and you are installing rack doors, go to Chapter 5, "Attaching the rack doors," on page 95

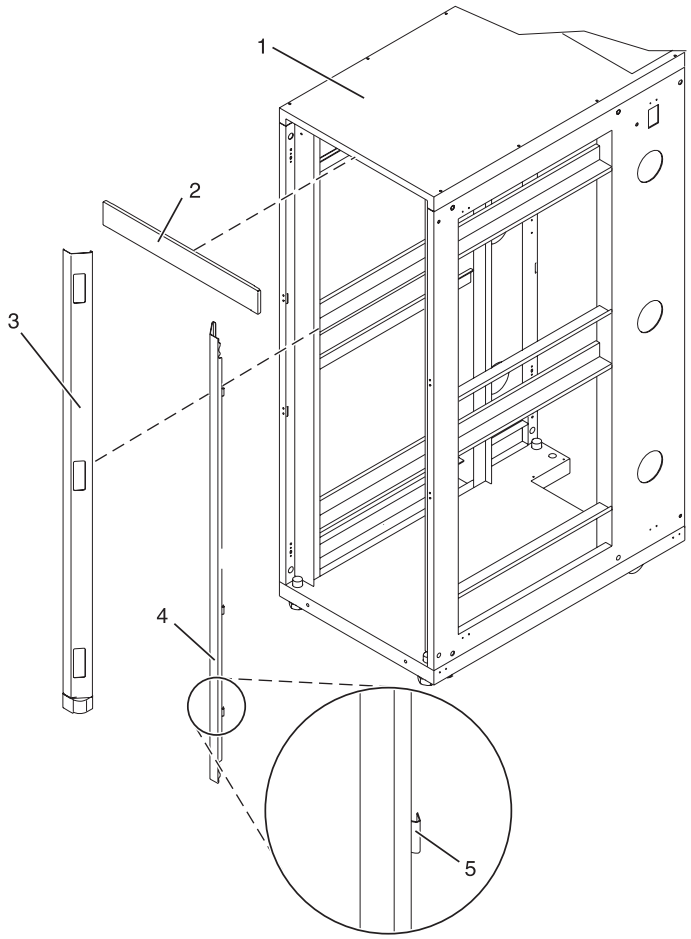
Attaching the rack to the concrete floor beneath a raised floor

If you plan to install front or back ac electrical outlets in the rack, the rack must be bolted to the floor. When you attach the rack to a concrete floor, which lays beneath a raised floor, follow the procedure described in this section.

Obtain the services of a mechanical contractor to attach the rack-mounting plates to the concrete floor. The mechanical contractor needs to determine that the hardware being used to secure the rack-mounting plates to the concrete floor is sufficient to meet the requirements for the installation.

To attach the rack to a concrete floor beneath a raised floor, do the following:

1. Put your rack in its predetermined location and tighten the locking screws on the casters.
2. If installed, remove the top, left and right trim panels. The trim panels are held in place with spring clips. See the following illustration.



1 Rack chassis
2 Top trim panel
3 Left-side trim panel
4 Right-side trim panel
5 Spring clip

Figure 8. Removing the trim panels

3. If installed, remove the front and rear doors. To remove a rack door, go to . After the rack doors have been removed, go to the next substep.
4. Locate the hardware mounting kit and the two mounting plates. Refer to the following illustration when reviewing the contents of the hardware mounting kit. The hardware mounting kit contains the following:
   - Four rack-mounting bolts
   - Four thin washers
   - Eight plastic isolator bushings
   - Four thick washers
   - Four spacers
5. If you are installing an ac-powered rack, temporarily install the lower plastic isolator bushings to help you locate the rack-mounting plate. After the mounting plate has been correctly located, remove the lower plastic isolator bushings.

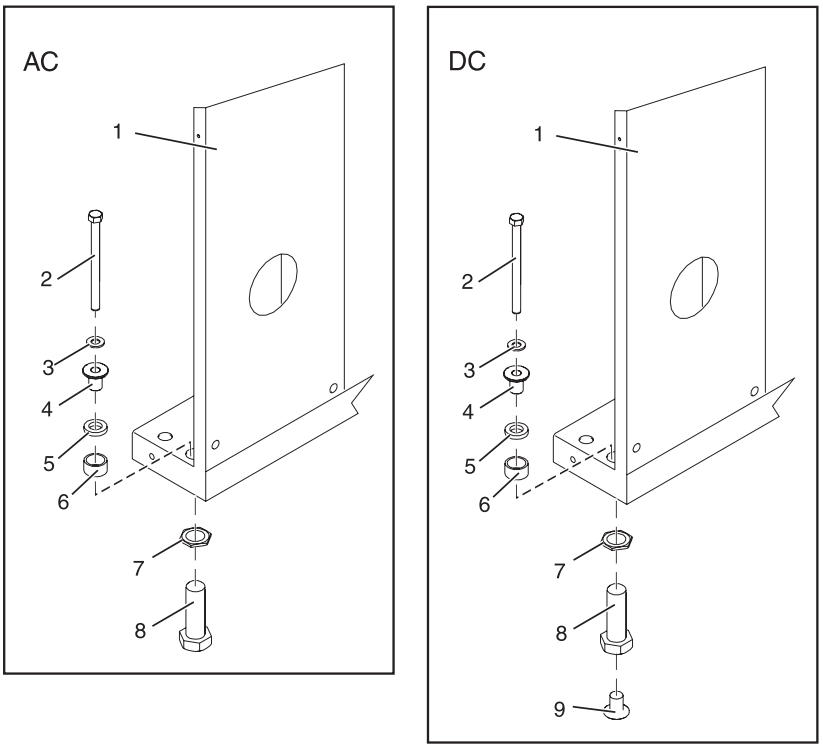
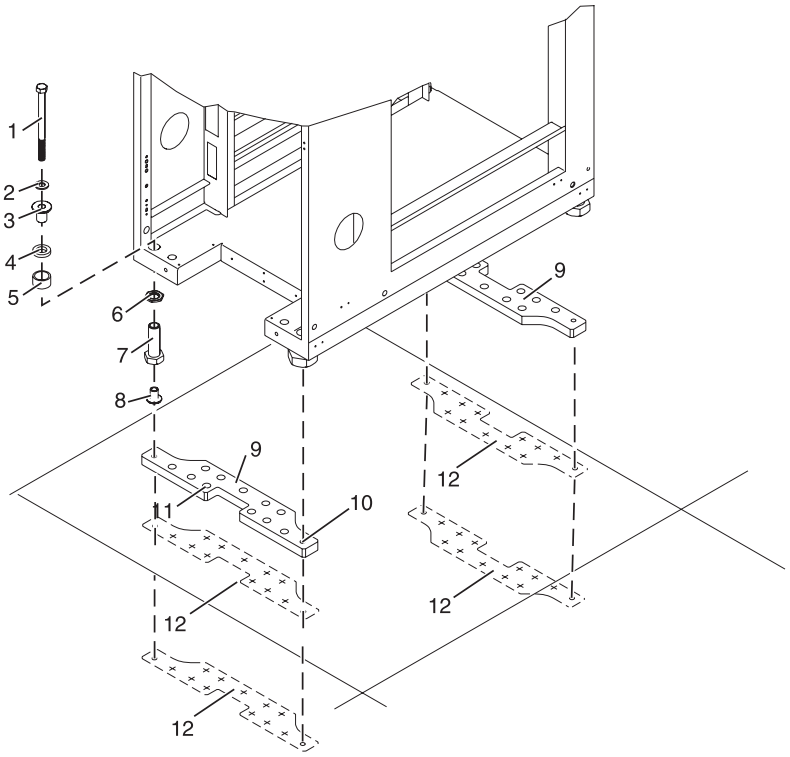


Figure 9. Installing the ac power-mounting plates

1 Rack chassis
2 Rack-mounting bolt
3 Thin washer
4 Top plastic isolator bushing
5 Thick washer
6 Spacer
7 Jam nut
8 Leveling foot
9 Lower plastic isolator bushing (used only on dc powered systems)
AC Typical leveling foot installation for an ac-powered rack
DC Typical leveling foot installation for an dc-powered rack

6. Position the two mounting plates in the approximate mounting location under the rack.
7. Create a rack-mounting bolt assembly by adding the following items, in the order listed, to each rack-mounting bolt.
   a. Thin washer
   b. Top plastic isolator bushing
   c. Thick flat washer
   d. Spacer
8. Insert a rack-mounting bolt assembly through each of the leveling feet.
9. Reposition the rack-mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the threaded bolt holes.
10. Turn the rack-mounting bolts four complete turns into the mounting plate's threaded bolt holes.
11. Mark the raised-floor panel around the edges of front and back rack-mounting plates.
12. Mark the plate bolt-down holes that are accessible through the opening in the back of the rack.
13. Remove the rack-mounting bolt assemblies.
14. If you are installing an ac-powered rack, remove the bottom isolator bushing from each of the leveling feet.
15. Remove the rack-mounting plates from the marked locations.
16. Loosen each of the locking screws on the casters.
17. Move the rack so that it is clear of both areas that were marked on the floor for the rack-mounting plate locations.
18. Reposition the mounting plates within the marked areas.
19. Mark the raised-floor panel at the center of each hole in the rack-mounting plates (including the tapped holes).
20. Remove the two rack-mounting plates from the marked locations on the raised floor panel.
21. Drill two clearance holes on each end of each rack-mounting plate. The drilled holes should be approximately 1-inch deep. This depth will accommodate any rack-mounting bolt extending past the rack-mounting plate when securing the rack to the rack-mounting plate.
22. For each rack-mounting plate, select at least two suitable hole locations. Select the hole locations as close to the threaded hole areas as possible. Be sure the hole locations selected at the back of the rack are accessible.
23. Drill pass-through holes in the raised-floor panel. The pass-through holes allow the anchor bolts to be inserted into the rack-mounting plate and pass through the raised floor panel to the concrete floor.

    Note: You *must* use a minimum of two anchor bolts for each rack-mounting plate to securely attach the rack-mounting plate through the raised-floor panel to the concrete floor. Because some of the holes in each rack-mounting plate may align with concrete reinforcement rods imbedded in the concrete, some of the rack-mounting plate holes may not be usable.
24. Transfer the locations of the anchor bolt holes (exclude the clearance holes drilled for the rack-mounting bolts) from the raised-floor panel to the concrete floor directly beneath, and mark the hole locations on the concrete floor.
25. Drill holes in the concrete floor to secure the anchor bolts.
26. Position the raised-floor panel back into position over the anchor bolt holes.
27. Position the front stabilizer bracket within the marked area on the raised-floor panel.
28. Using your anchor bolts, secure the front stabilizer brackets on top of the raised floor and through to the concrete floor.
29. Position the rear stabilizer brackets within the marked area on the raised-floor panel.



1 Rack-mounting bolt
2 Thin washer
3 Top plastic isolator bushing
4 Thick washer
5 Spacer
6 Jam nut
7 Leveling foot
8 Lower plastic isolator bushing (used only on dc-powered systems)
9 Stabilizer brackets
10 Threaded hole (used to secure the rack to mounting plate.)
11 Anchor bolt hole
12 Traced pattern (pattern to be traced onto the floor using the mounting plate as a template)

Figure 10. Securing the rack to the floor

30. Using your anchor bolts, secure the back stabilizer bracket on top of the raised floor and through to the concrete floor.
31. Replace all raised-floor panels that may have been removed when aligning and securing the anchor bolts to the concrete floor.
32. Align the rack over the front and back stabilizer brackets.
33. Insert each of the bolt assemblies through a leveling foot.
34. Align the rack-mounting bolts with the threaded holes in each stabilizer bracket. Turn each bolt three to four rotations.
35. Tighten the locking screw on each caster.
36. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base of the rack.
37. If you have multiple racks that are connected as a suite (bolted to each other), go to Chapter 8, “Connecting multiple racks with rack-to-rack attachment kit,” on page 107. Otherwise, torque the four bolts to 40-50 ft-lbs (54-67 nm).
38. If you are not installing doors on your rack, install the top, left, and right trim panel.

39. Connect the power distribution system as described in "Connecting the power distribution system."
40. After the rack is bolted down and you are going to attach a front electrical outlet, go to "Attaching the front or back ac electrical outlet" on page 16.
41. If you are not going to attach a front electrical outlet and you are installing rack doors, go to Chapter 5, "Attaching the rack doors," on page 95.

Connecting the power distribution system

You can use a power distribution system to monitor the individual power loads of the devices that are plugged into it. Use the procedure in this section to connect this system.

To connect a Power Distribution Unit, see Chapter 11, "Power distribution unit plus," on page 117.

Checking the ac outlets

To help ensure safety and reliable operation, you should check the ac outlets. Use the procedure in this section to perform this task.

Before you begin, ensure that you have a multimeter to check voltages and an appropriately approved ground-impedance tester to test the grounding resistances.

Note: Use only an appropriately approved ground-impedance tester to test the grounding resistances. Do not use a multimeter to measure grounding resistance.

Before plugging the rack into the ac power source, complete the following checks on the ac power source.

1. Turn off the branch circuit breaker for the ac power outlet that the rack will plug into. To the circuit breaker switch, attach tag S229-0237, which reads "Do Not Operate."

   Note: All measurements are made with the receptacle faceplate in the usual installed position.
2. Some receptacles are enclosed in metal housings. For this type of receptacle, do the following:
   a. Using a multimeter, check for less than 1 volt from the receptacle case to any grounded metal structure in the building, such as a raised-floor metal structure, water pipe, building steel, or similar structure.
   b. Using a multimeter, check for less than 1 volt from the receptacle ground pin to a grounded point in the building.

      Note: If the receptacle case or faceplate is painted, be sure the probe tip penetrates the paint and makes good electrical contact with the metal.
   c. Using a multimeter, check the resistance from the receptacle ground pin to the receptacle case. Check resistance from the ground pin to the building ground. The readings should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.
3. If any of the checks made in step 2 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections. Recheck the receptacle after the wiring is corrected.
4. Using a ground-impedance tester, check for infinite resistance between the ground pin of the receptacle and each of the phase pins. This is a check for a wiring short to ground or a wiring reversal.
5. Using a ground-impedance tester, check for infinite resistance between the phase pins. This is a check for a wiring short.
6. Turn on the branch circuit breaker.
7. Using a multimeter, measure for the appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.
8. Using a multimeter, verify that the voltage at the ac outlet is correct.

Attaching the front or back ac electrical outlet

If you need to attach an ac outlet, you can use the procedure in this section to perform this task.

Attention: The front and back ac outlet-mounting plates mount through the same mounting holes in that secure the stabilizer brackets to the rack chassis. Therefore, if the rack must be bolted to the floor, the stabilizer brackets must be removed.

Install the ac outlet-mounting plates only after the rack has been bolted to the floor and the stabilizer brackets have been removed.

The following items are installed at the customer's site:

- The ac outlet-mounting plates for installing customer-supplied ac electrical outlets on the front or back of the rack. The ac outlet-mounting place provides the mounting location for an ac electrical outlet.
- The brass ground lug for an electrostatic discharge (ESD) connection.

Note: The customer is responsible for providing both the outlets and the power cables that attach to the power source. The customer is also responsible for connecting the ac outlet correctly. These items are not field-replaceable units (FRUs).

Installing the ac outlet-mounting plates with ac outlets

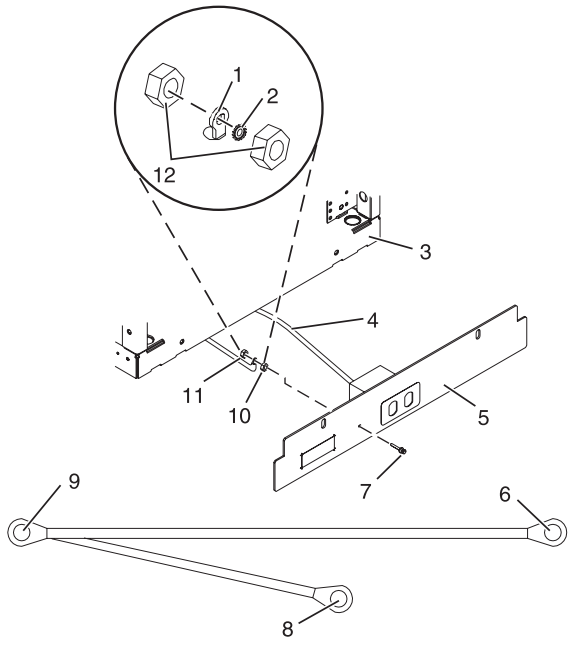
If you choose to install ac mounting plates, you can follow the procedure detailed in this section to perform this task. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

If you do not want ac outlets installed on the rack, go to "Installing the ac outlet-mounting plate without ac outlets" on page 18.

If you want ac outlets installed on the front or back ac outlet-mounting plate, do the following:

1. Determine the number of ac outlets that you are installing.
2. Confirm with your contractor that the number and location of ac outlets to be installed are correct.
3. Remove the blank filler plates from the ac outlet-mounting plates for the number of ac outlets being installed.
4. Install the ac outlets on the ac outlet-mounting plate.
5. Install the ground lug in the ac outlet-mounting plate using only one nut, as shown in the following illustration.
6. Securely tighten the one nut on the ground lug.
7. Locate the ″Y″-shaped ground cable supplied with the mounting plate.

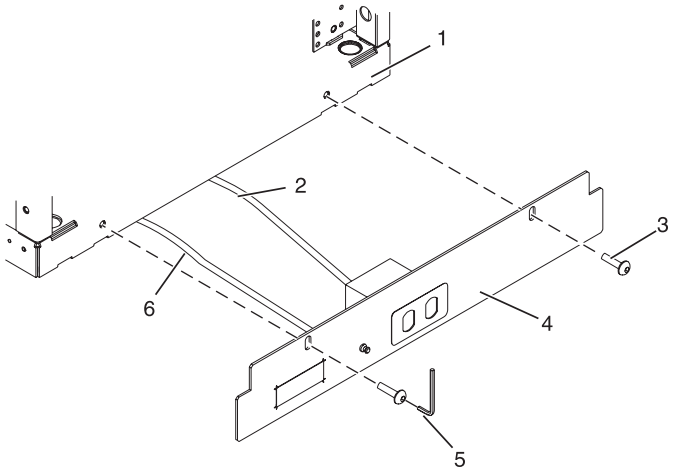
   Note: The remaining steps can be used to install ac outlets on the front or the back of the rack.
8. Place the star washer onto the ground lug of the front ac outlet-mounting plate.
9. Place the lug on the long end of the ground cable onto the ground lug.
10. Place a ground lug nut onto the ground lug and securely tighten it.
11. Position the front ac outlet-mounting plate onto the rack frame with the ground lug fully inserted through the mounting holes in the rack.
12. Route the cable under the rack.
13. Place the star washer onto the ground lug of the back ac outlet-mounting plate.
14. Place the lug on the short end of the ground cable onto the ground lug.
15. Place a ground lug nut onto the ground lug and securely tighten it.



1 Ground cable lug
2 Star washer
3 Front of rack
4 Power cable from the power source
5 Mounting plate
6 Long end of ground cable
7 Ground lug
8 Ground connector (short end of ground cable)
9 ″Y″ End of ground cable
10 Ground lug nut (quantity 2)
11 Long end of ground cable
12 Ground lug nut (quantity 2)

Figure 11. Installing the ground lug

16. Position the back ac outlet-mounting plate onto the rack frame with the ground lug fully inserted through the mounting holes in the rack.
17. Install the front ac outlet-mounting plate screws (stabilizer mounting screws) into the mounting plate and through the mounting holes in the rack. Securely tighten the screws.



1 Front or back of rack (as applicable)
2 Power cable from power source
4 Mounting plate
5 Allen wrench

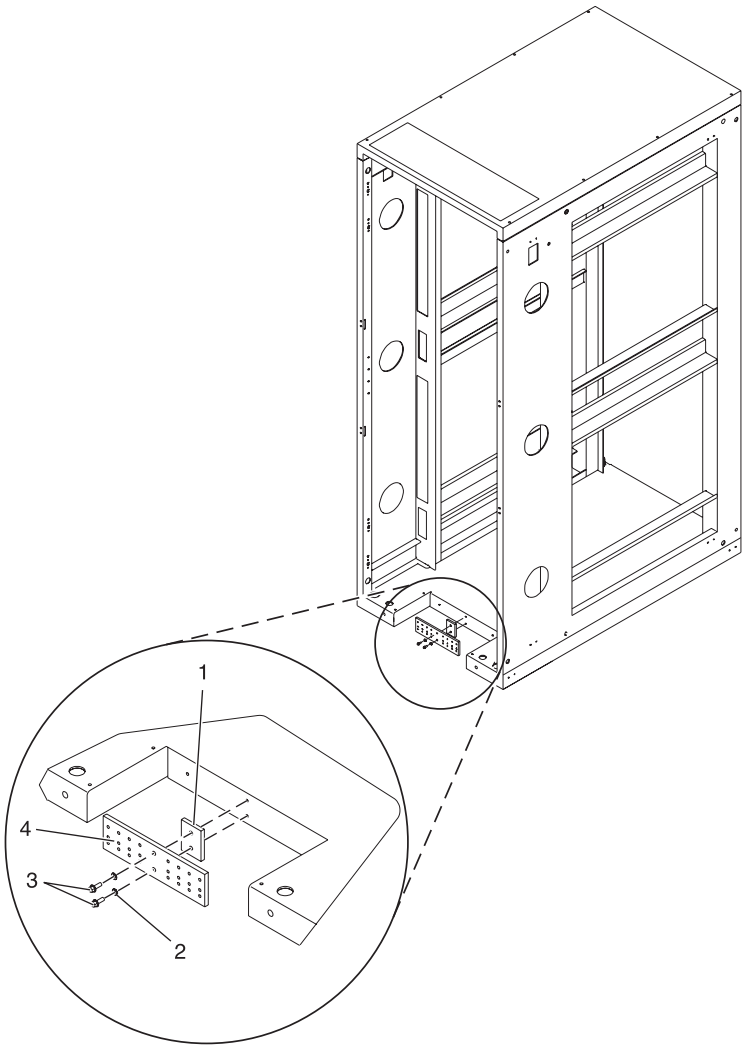
3 Button-head screw

6 Long end of ground cable

Figure 12. Installing the front mounting plate

18. Connect the ″Y″-shaped end of the ground cable to the rack frame, either near the center in the back of the rack or to the ground bus bar at the back of the rack.
19. Install the back ac outlet-mounting plate screws (stabilizer mounting screws) into the mounting plate and through the mounting holes in the rack. Securely tighten the screws.

    Note: The bus bar might be located at either the top or bottom of the rack.



1 Bus bar mounting plate

2 Lock washer (quantity 2)

3 Hex screws (M5 x 20) (quantity 2)

4 Ground bus bar

Figure 13. Installing the back mounting plate

Installing the ac outlet-mounting plate without ac outlets

If you choose to install an outlet plate without the outlets, use the procedure in this section to perform this task.

If you do not want any ac outlets installed on the front or rear ac outlet-mounting plate, perform only "Attaching the rack to the concrete floor beneath a raised floor" on page 11 through "Connecting the power distribution system" on page 15.

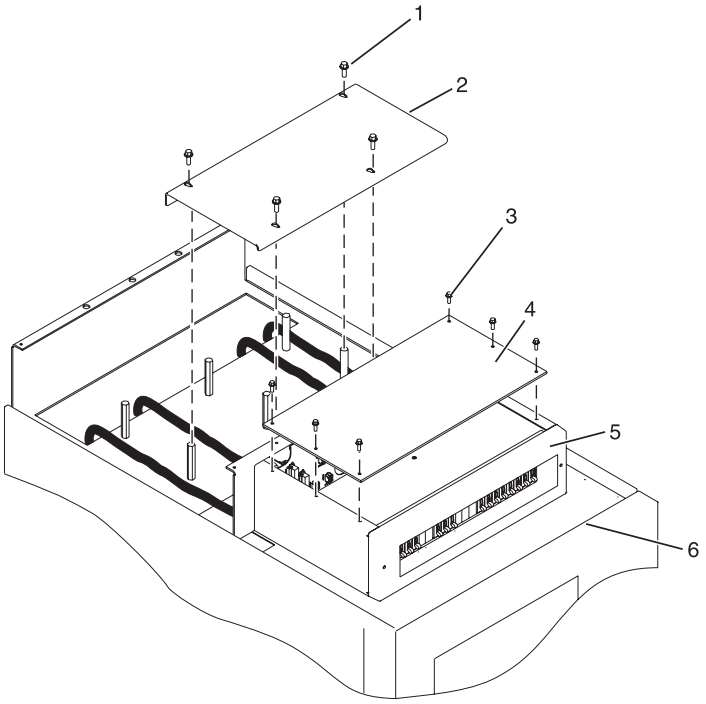
For front or rear ac outlet-mounting plates, refer to "Installing the ac outlet-mounting plates with ac outlets" on page 16.

Connecting a dc power source

Some rack models (such as the 7014-T00) can support a dc power configuration for servers that require dc power. If you decide to connect a dc power source to the rack, You can use the procedure in this section to perform this task. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

Note: The customer is responsible for providing and connecting the -48 V dc power source and -48 V dc power return cables from the customer's source -48 V dc to the bus bars in the power distribution panel. The customer is also responsible for connecting the ground cable to the rack frame. This procedure provides information about accessing the power distribution panel.

1. Remove the six mounting screws from the top cover of the dc power distribution panel and remove the top cover.
2. If they are installed, remove the four screws from the cable channel cover.
3. Remove the cable channel cover.



1 Cable channel cover retaining screw
2 Cable channel cover
3 Power distribution panel top cover retaining screws
4 Power distribution panel top cover
5 Shield
6 Power distribution panel

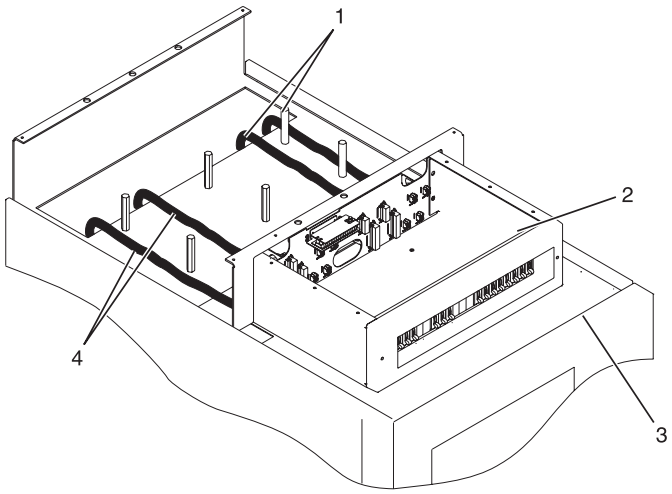
Figure 14. Removing the cable channel cover

4. Remove the -48 V dc bus bar shield from the power distribution panel.

Attention: The bus bar shield must be correctly reinstalled over the -48 V dc return bus bars to protect against injury while servicing the power distribution panel.

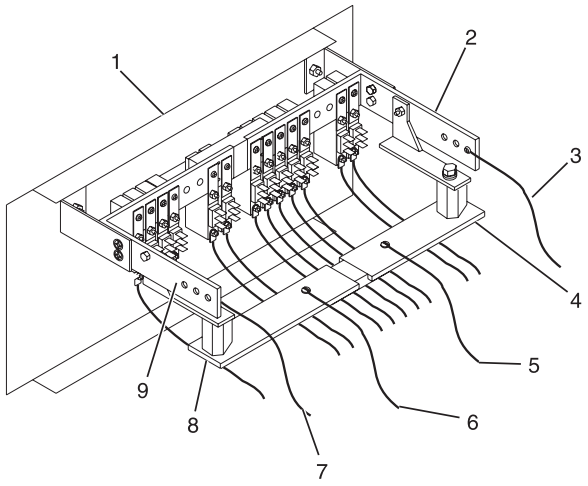
5. Ensure that the following steps are performed when connecting the dc power source.
   a. At -48 V dc power source, turn off any -48 V dc power sources that will be connected to the power distribution panel.
   b. After the -48 V dc power sources are turned off, be sure there is a tag or label over the power source switches or fuses (lock-out/tag-out) to indicate that the power source is turned off intentionally.

      Note: Ensure that any oxidation on the copper bus bars is removed.
   c. If this is a raised-floor installation and you are working at the back of the rack, route the power cables up the rack's right side.
   d. Ensure that the external -48 V dc power cable is connected correctly to the -48 V dc bus bar.
   e. Ensure that the external -48 V dc return cable is routed correctly and installed on the return bus bar.



1 -48 V dc power cable and return power cable
2 Power distribution panel
3 Front of rack
4 -48 V dc power cable and return power cable

Figure 15. Routing the power cables



1 Front of power distribution panel
2 (A) -48 V dc (-) bus bar
3 (A) -48 V dc (-) power cable
4 (A) Return (-) bus bar
5 (A) Return (-) power cable
6 (B) Return (-) power cable
7 (B) -48 V dc (-) power cable
8 (B) Return (-) bus bar
9 (B) -48 V dc (-) bus bar

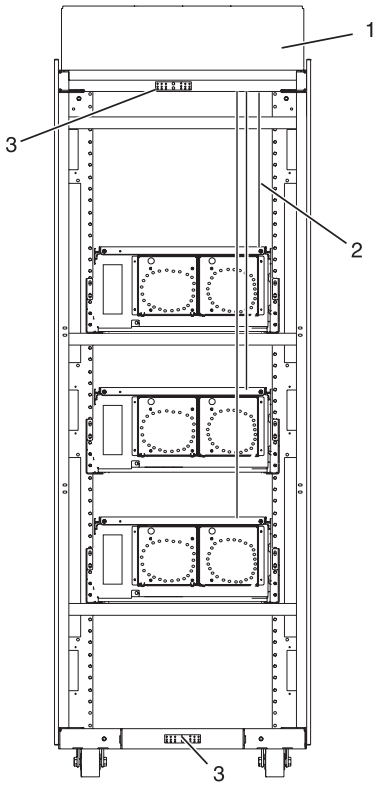
Figure 16. Return bus bar

f. If you want to install a power status alarm, connect the alarm cable to the terminal board on the back cover of the dc power distribution panel.

   Note: Ensure that you remove the oxidation on the copper bus bars.

g. Ensure that the power-source ground cable is routed correctly and connects the power-source ground cable to the copper bar at the lower-back or upper-back center of the rack.

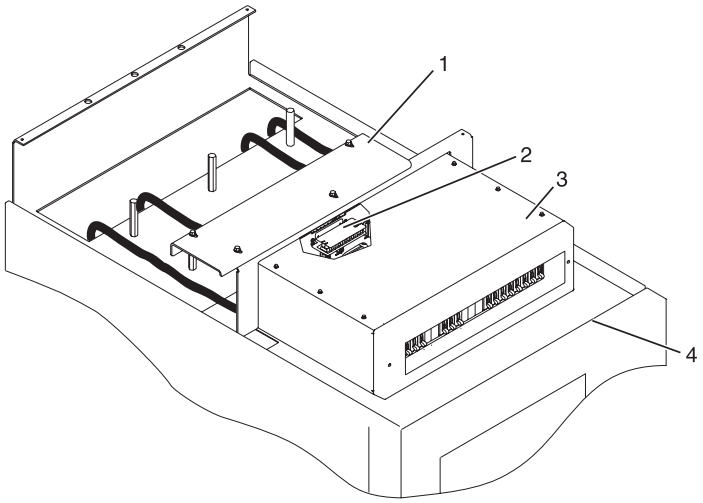
h. If the rack is on a raised floor, attach the -48 V dc power source cables to the back of the rack with cable-restraint straps.



1 Back view of rack (dc)
2 Power cable, power return cable, and ground
3 Ground cable (Install at either top or bottom of the rack)

Figure 17. Cable locations

6. Reinstall the -48 V dc bus bar shield.
7. Reinstall the top cover on the dc power distribution panel.
8. Reinstall the cable channel cover.



1 Cable channel cover

2 Terminal block (both sides)
3 Power distribution panel
4 Front of rack

Figure 18. Reinstalling the cable channel cover

Chapter 3. Installing a system or expansion unit into a rack

You might need to install a system or expansion unit into a rack. In addition to important related safety information, this section provides procedures that you can follow to perform these tasks. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

The following procedures describe how to install system units or expansion units into a rack. You can perform this task or contact a service provider to perform the task for you. You might be charged a fee by the service provider for this service.

Installing the model 8204-E8A, or 9409-M50 into a rack

You might need to install the system into a rack. Use the procedure in this section to perform this task. In addition to information intended to promote safety and reliable operation, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

This is a customer task. You can perform this task yourself, or contact a service provider to perform the task for you. You might be charged a fee by the service provider for this service.

Important: To complete this procedure, it is suggested that you use two people to attach the rail assembly to the rack, one in front of the rack and one at the back of the rack. You will need three people to lift the system unit onto the rack.

This procedure assumes that you are installing the system into an existing rack. If the rack is not installed, go to the instructions for Chapter 2, "Installing the rack," on page 3 and then return to this procedure for instructions on installing the system unit in a rack.

Note: This procedure applies only to the models that are designed to be mounted in a rack. Do not attempt to install a stand-alone model in a rack.

To install the model Installing the model 8204-E8A, or 9409-M50 into a rack into a rack, complete the following steps:

CAUTION:
Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

1. Read the "Rack safety notices" on page 96.
2. If you have not already done so, refer to Figure 19 on page 26 and complete a parts inventory.

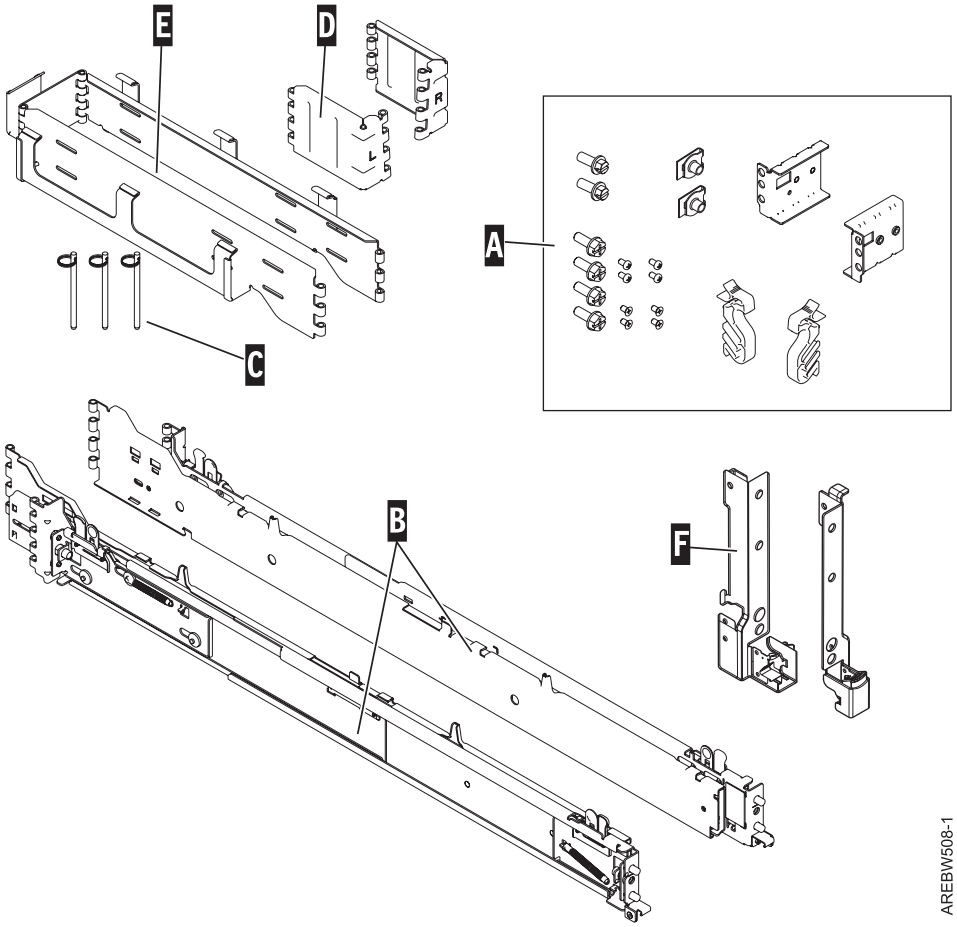


Figure 19. Rack-mounting kit

- **A** Rack-mounting hardware kit
  - Four large retaining screws
  - Two medium-sized screws
  - Two nut clips
  - Eight small retaining screws
  - Two rail support brackets
  - Two cable-restraint brackets
- **B** Left and right rack rails with rack brackets
- **C** Cable-management arm pins
- **D** Two cable-management arm brackets (one for left-side installation, one for right-side installation)
- **E** Cable-management arm
- **F** Two rack latches

If there are incorrect, missing, or damaged parts, contact:

- Your IBM reseller
- IBM Rochester Manufacturing Automated Information Line at 1-800-300-8751 (United States only)
- Directory of worldwide contacts Web site at http://www.ibm.com/planetwide (Locate your service and support telephone numbers.)

3. Locate the rack-mounting hardware kit (A), and the rack rails (B) that were included with your system unit as shown in Figure 19 on page 26.

   The system rails (B) are front-to-back and left-to-right side dependent. The rails are labeled left and right to indicate their placement when you face the front of the rack. The back of each rail has two large latch assemblies. These latch assemblies go in the back of the rack.
4. Determine where you will locate the system unit in the rack. See "Determining the location."

Determining the location

You might need to determine where to install the system in the rack. Use this procedure to perform this task.

Before installing the system unit into a rack, complete the following steps:

1. Read the "Rack safety notices" on page 96.
2. Plan where you will place the units. Place the larger and heavier units in the lower part of the rack.

   This system unit is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 7 in. (177.8 mm) high and covers 12 mounting holes in the rack.
3. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit.

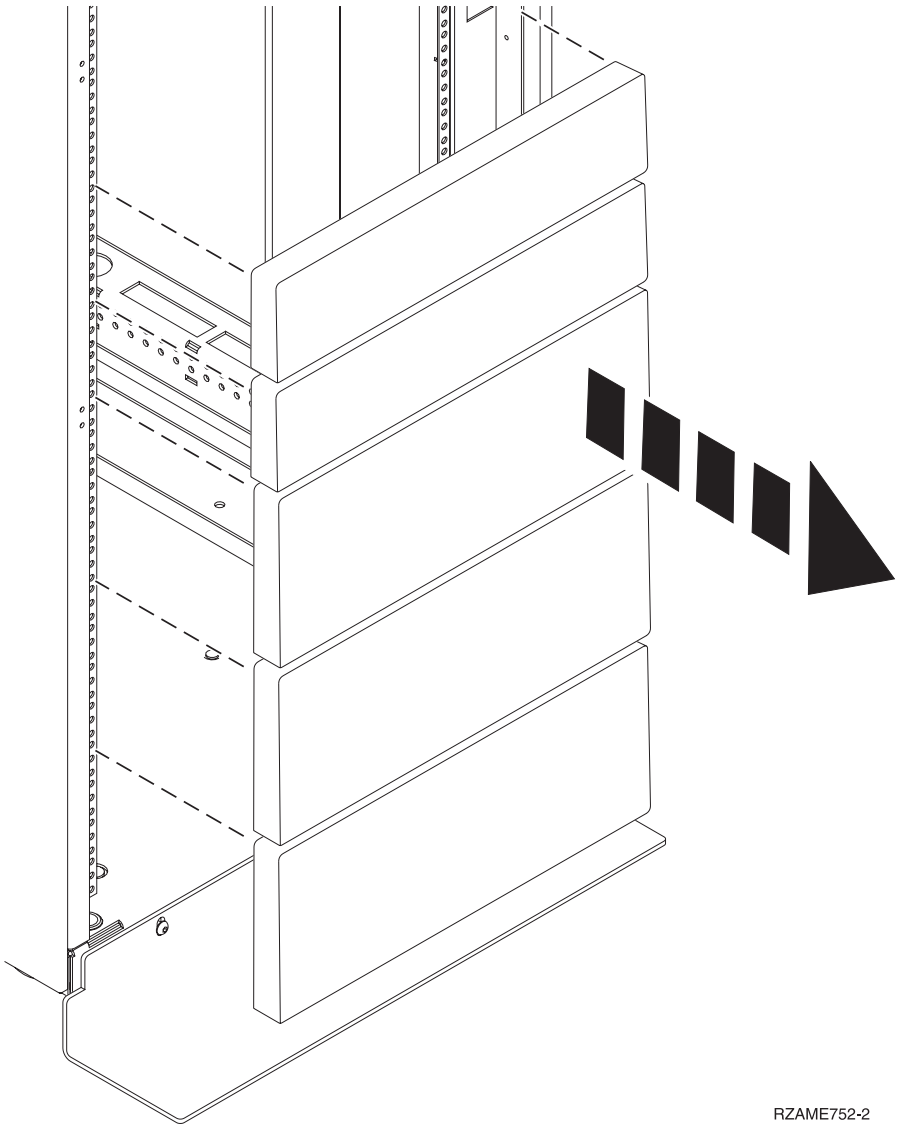


Figure 20. Removing the filler panels

4. If necessary, remove the front and back rack doors.
5. Mark the location: see "Marking the location."

Marking the location

You might need to mark the installation location. Use this procedure to perform this task.

To mark the installation location and install the nut clips into a rack without using the rack-mounting template, complete the following steps:

1. Determine where in the rack to place the system. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack. Record the EIA location. The system is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system therefore is 7 in, (177.8 mm) high and covers 12 mounting holes in the rack.
2. Facing the front of the rack and working from the right side, place a self-adhesive dot next to the bottom hole of the bottom EIA unit of the four you will be using for this system unit (**A** in Figure 21 on page 29).

Note: The self-adhesive dots are used to aid in identifying locations on the rack. If you do not have the dots, use some other form of marking tool to aid you in identifying hole locations (for example, tape or a marker). You need to identify the marked hole from both the front and back of the rack.

3. Place another self-adhesive dot next to the bottom hole of the bottom EIA unit on the left side of the rack.
4. Go to the back of the rack. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.

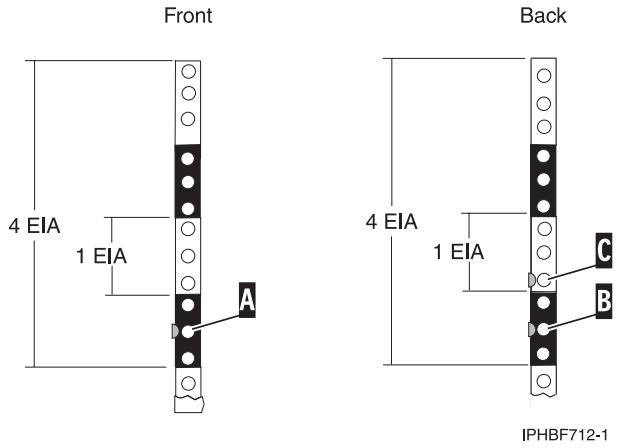


Figure 21. Marking holes on the front and back of the rack frame

5. Place a self-adhesive dot at the middle hole of the bottom EIA unit (**B** in Figure 21).
6. Place a self-adhesive dot at the bottom hole of the next (higher) EIA unit (**C** in Figure 21).
7. Mark the corresponding holes on the left side of the rack.

Attaching the 8204-E8A, or 9409-M50 mounting hardware to the rack

You might need to attach the mounting hardware to the rack. Use the procedure in this section to perform this task. In addition to information intended to promote safety and reliable operation, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

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 used on your rack. Do not install mismatched hardware using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller. Also, to install the rails correctly, perform each task in the following order.

To install the rack-mounting hardware into the rack, complete the following steps:

1. With the right rail, pull back the latch assembly release tab, (**A** in Figure 22 on page 30), and then slide tab (B) back to the retracted position and lock the latch assembly. The back-alignment pins should be fully retracted.
2. After the alignment pins are retracted, insert the right side rail's front-alignment pin, as shown in Figure 22 on page 30, into the rack front flange hole identified by the self-adhesive placement dot that you previously installed. Have a second person hold the rail securely in the front hole.

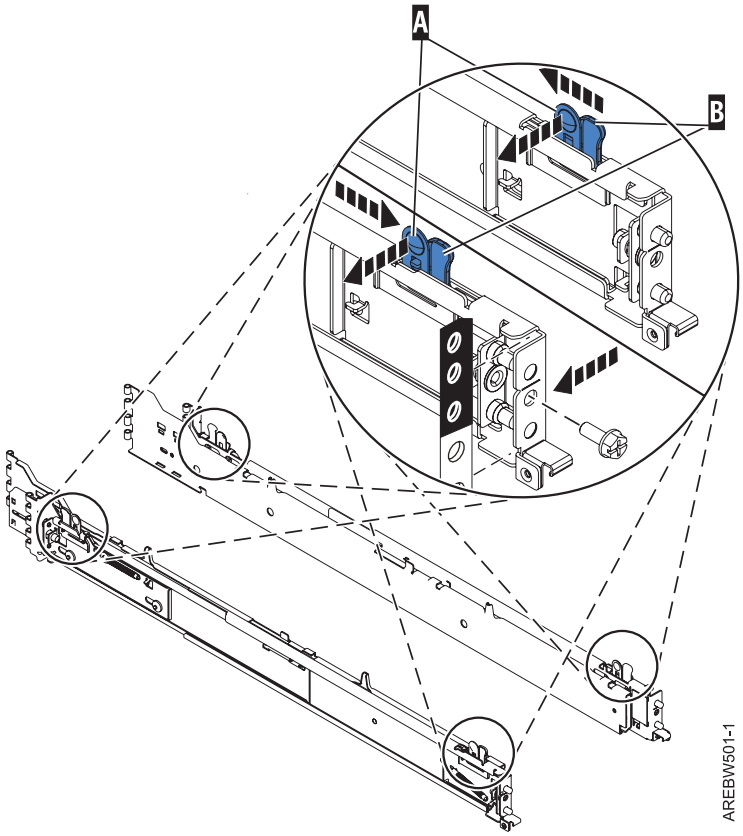


Figure 22. Front slide rail alignment pin, retaining screws, and latch bracket

3. Align the back-alignment pins of the rail with the holes at the back of the rack identified by the self-adhesive placement dots on the back of the rack. The back EIA location will be one position higher than the front rail position. Ensure that the rails are level.
4. Slide the release tab **(B)** to extend the two back-alignment pins into the back of the rack. Ensure that the pins have passed through the correct holes in the rack frame.
5. From the back of the rack, insert one of the large rail-retaining screws into the hole that is located between the two back alignment pins. Partially tighten the screw. Do not tighten completely at this time.
6. Install the rail support brackets as shown in Figure 23 on page 31.

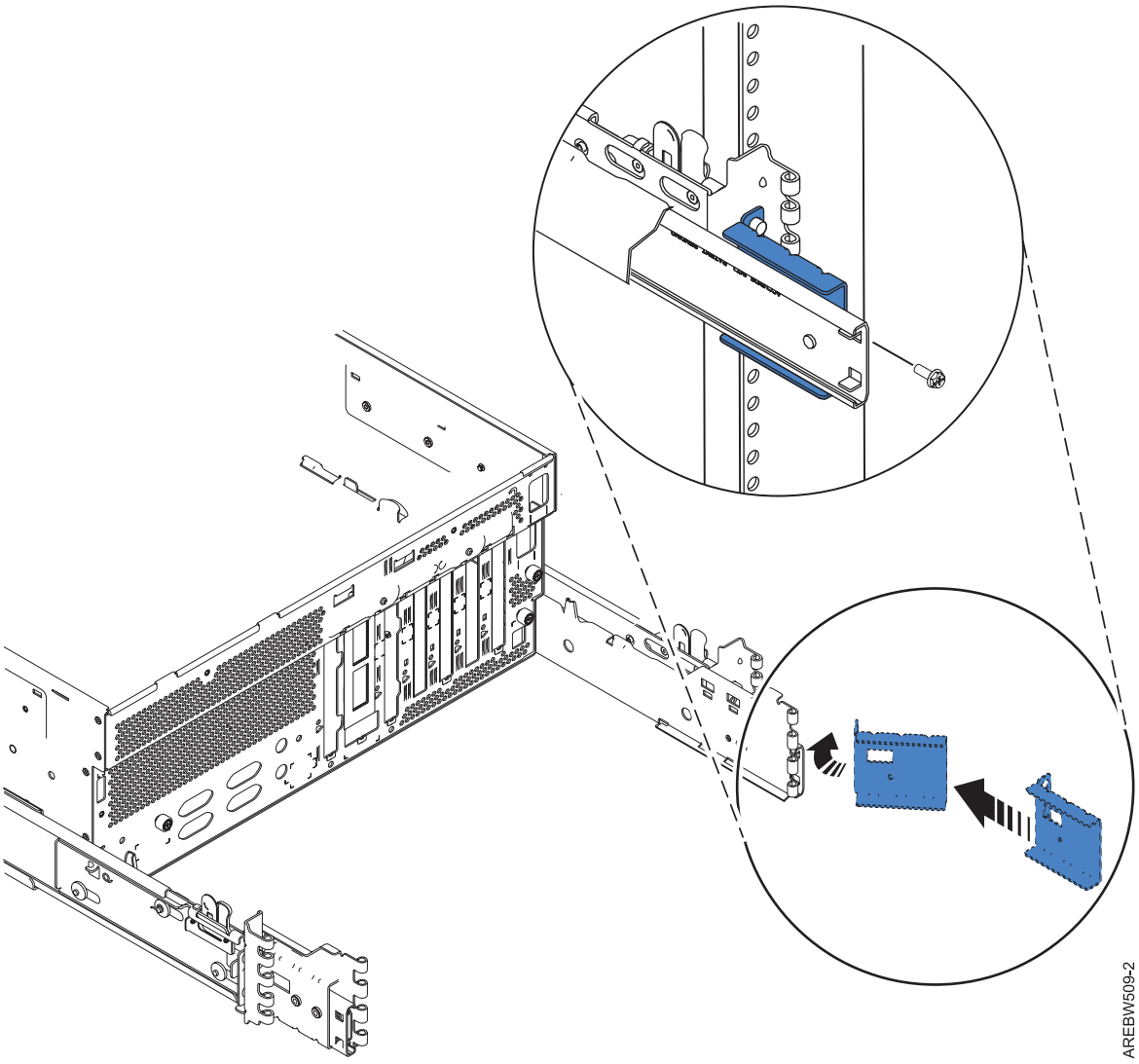


Figure 23. Installing the rail support brackets

7. Repeat steps 1 on page 29 through 5 on page 30 for the left side rail.
8. Locate the two latch brackets, (**F** in Figure 19 on page 26). To install the rack latches use the following procedure :
   a. Rotate the top of the bracket out as shown in Figure 24 on page 32.

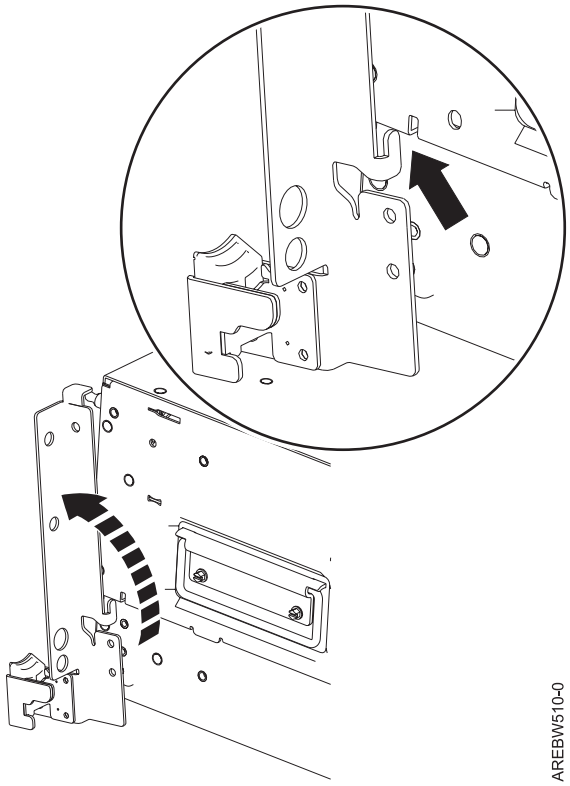


Figure 24. Rotate the top of the bracket out

b. Align the bracket with the slot on the side of the server as shown in Figure 25 on page 33.

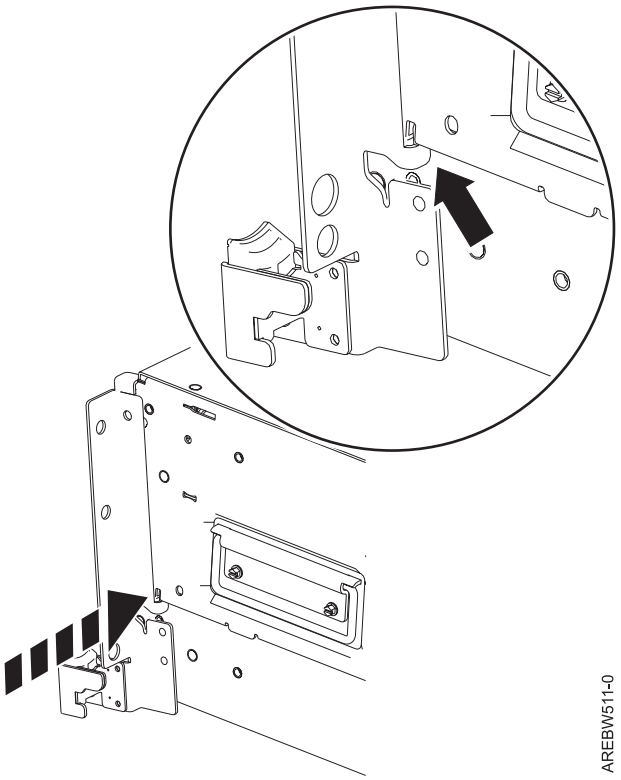


Figure 25. Align the bracket with the slot on the side of the server

c. Move the bracket up to engage the tab as shown in Figure 26.

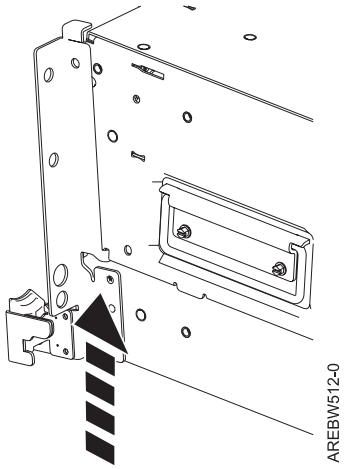


Figure 26. Move the bracket up to engage the tab

d. Rotate the top of the bracket back so that top tab is on top of the chassis and install the screws as shown in Figure 24 on page 32.

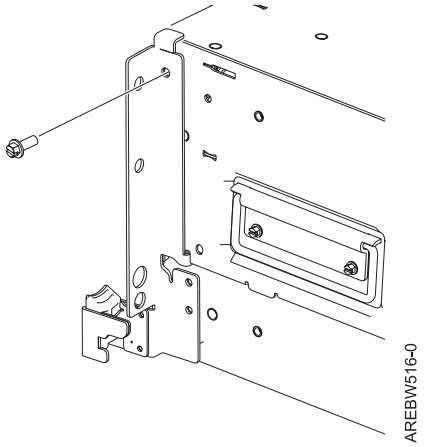


Figure 27. Rotate the top of the bracket back so that top tab is on top of the chassis and install the screws

9. Extend the inner rails by pulling the rails out. They should be extended from the frame like the rails shown in Figure 28.
10. Using three people, grasp the two handles located on each side of the system drawer, and place the system onto the inner rail as shown in Figure 28.

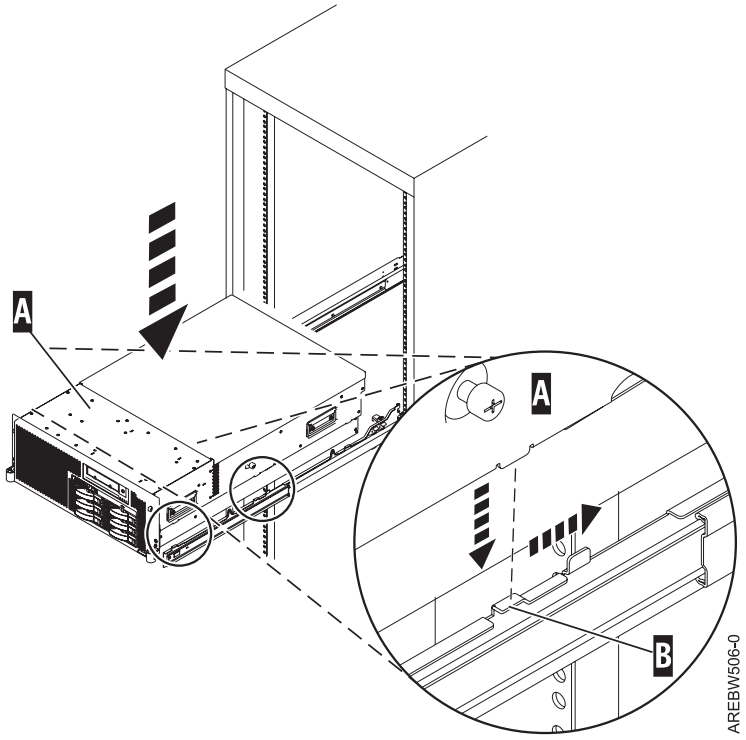


Figure 28. Place system onto the rails

11. After the system is firmly in place, simultaneously press the safety latches and push the system unit into the rack as shown in Figure 29 on page 35.

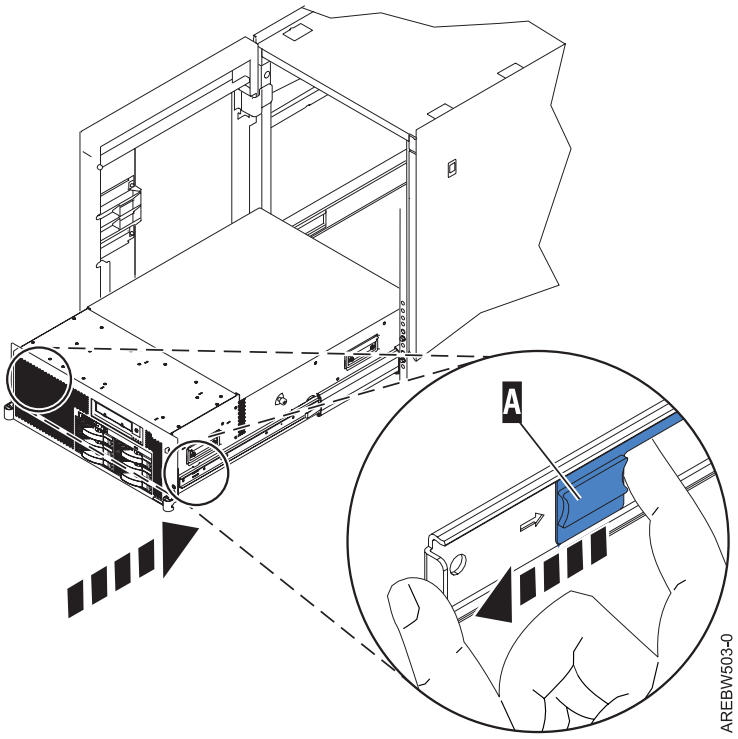


Figure 29. Inner rail extended

12. Install and position the nut clips (shown in blue) before inserting the screws. Use the retaining screws to attach the system to the rack as shown in Figure 30 on page 36.

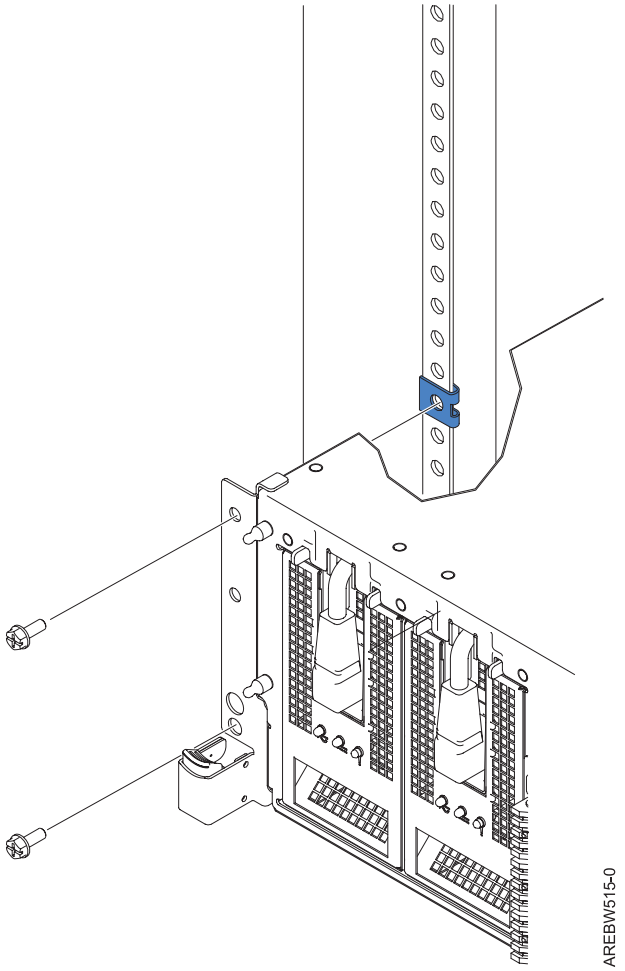


Figure 30. Secure system to rack through rack latches

13. After both rails have been installed, ensure that none of the rail's retaining screws are more than finger tight. The rails must be level from front to back and from left to right.

Installing the cable-management arm

You might need to install the cable-management arm. Use this procedure to perform this task.

To install the cable-management arm, complete the following steps:

1. Determine on which side of the rack you want to install the cable-management arm.
2. Place the correct arm bracket (Left or Right) with the cable-management arm.
3. Use pin **F** to pin the cable-management arm **E** to the rack frame **D** as shown in Figure 31 on page 37.

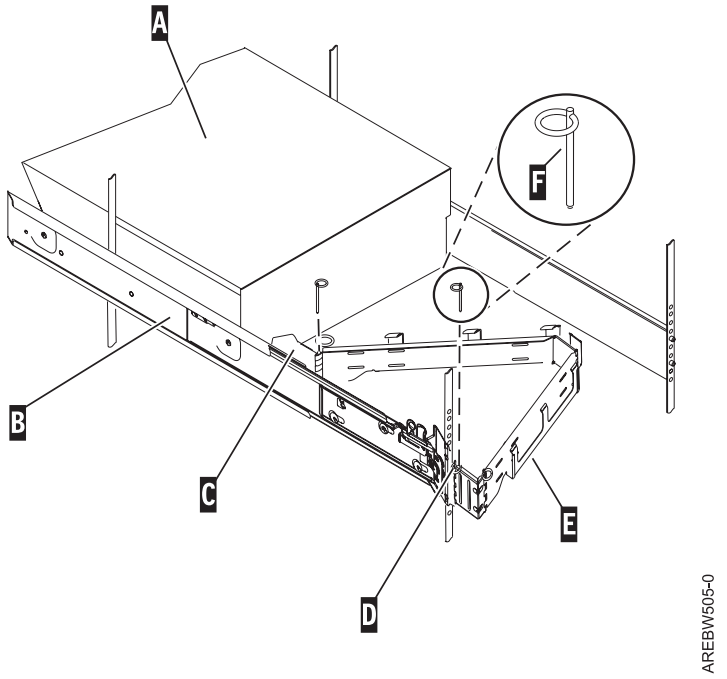


Figure 31. Attaching the cable-management arm.

Tip: If access to the back of the rack is obscured by a large number of existing cables, it might be easier to remove the small connecting hinge from the cable-management arm and attach it first. Then, you can attach the remaining section of the cable-management arm to the connecting hinge.

4. Use the second pin **F** to pin the other end of the cable-management arm to the flange **C** that is attached to the sliding portion of the left system rail assembly **B** as shown in Figure 31.

Determining power cord, plug, and receptacle type

To determine what power cord, plug, and receptacle type your server or system requires, you need to know the country or region in which your server or system will reside, your server or system model, and the voltage and amperage of your power supply.

See Modification of IBM Cords for recommendations regarding the alteration of power cords.

Tip: Print the **Plug and receptacle type** table for your server or system and give it to your electrician. The table contains information needed to install the proper receptacle for your system expansion unit.

The server or system and all of the expansion units and attached equipment will require an isolated power supply. This means, it must have its own circuit. Use an uninterruptible power supply to help protect both the server and its data.

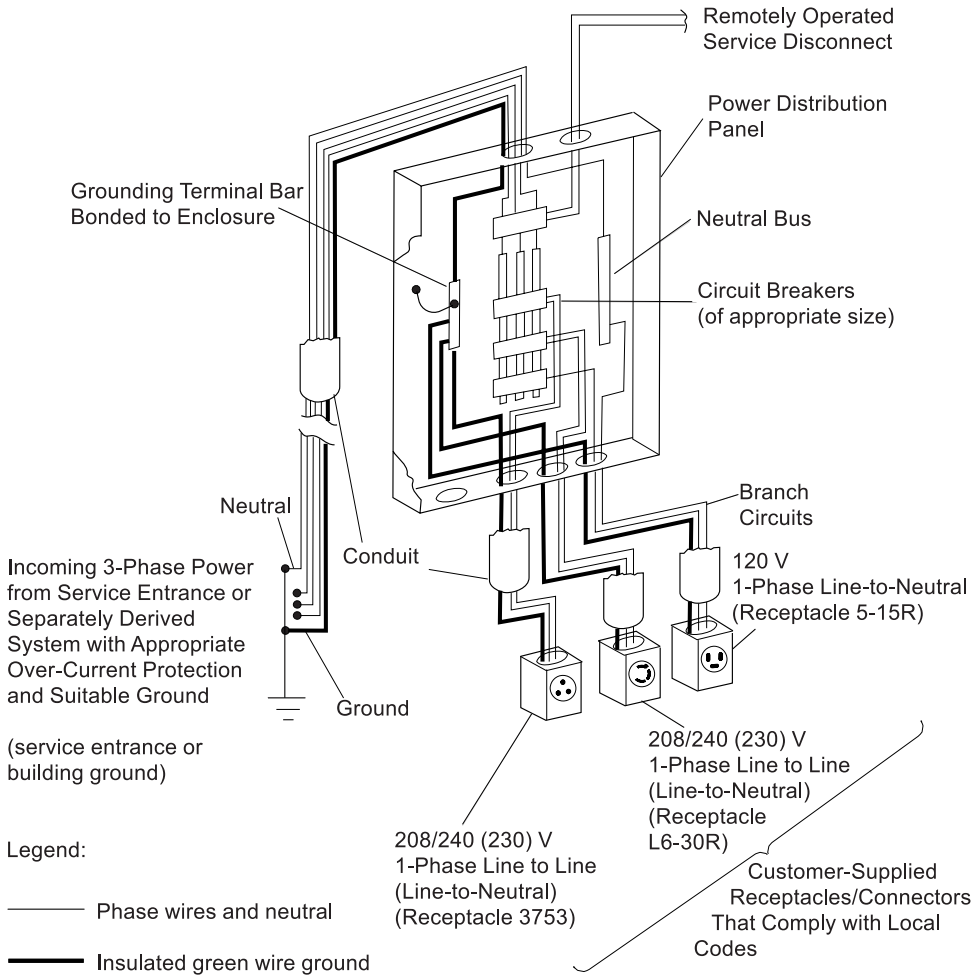


Figure 32. Typical power distribution system that is grounded properly

With this information, you can determine your type through these tables:

Installing the model 8203-E4A, 9407-M15, or 9408-M25 into a rack

You might need to install the system into a rack. Use this procedure to perform this task. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are also provided and these show how the components relate to each other.

This is a customer task. You can perform this task yourself, or contact a service provider to perform the task for you. You might be charged a fee by the service provider for this service.

Important: To complete this procedure, it is suggested that you use two people to attach the rail assembly to the rack, one in front of the rack and one at the back of the rack. You will need three people to lift the system unit onto the rack.

This procedure assumes that you are installing the system into an existing rack. If the rack is not installed, go to the instructions for Chapter 2, “Installing the rack,” on page 3 and then return to this procedure for instructions on installing the system unit in a rack.

Note: This procedure applies only to the models that are designed to be mounted in a rack. Do not attempt to install a stand-alone model in a rack.

To install the model 8203-E4A, 9407-M15, or 9408-M25 into a rack, complete the following steps:

CAUTION:
Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

1. Read the "Rack safety notices" on page 96.
2. If you have not already done so, refer to Figure 33 and complete a parts inventory.

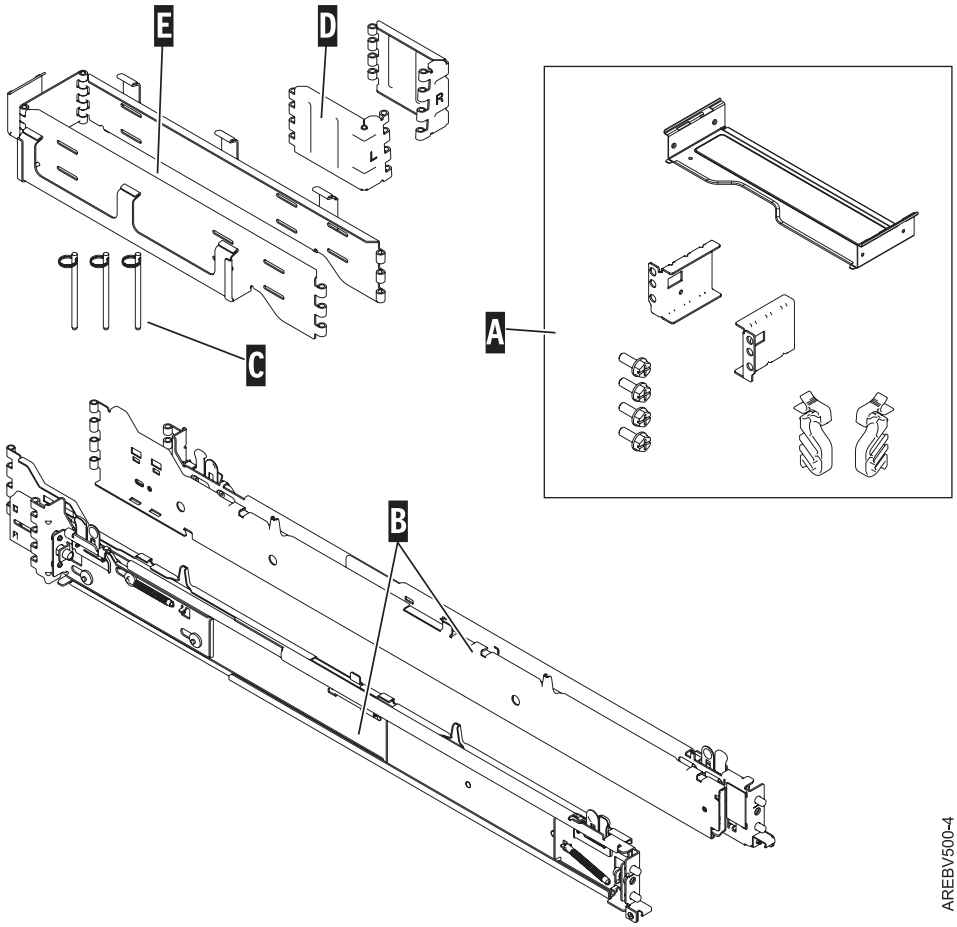


Figure 33. Rack-mounting kit

- **A** Rack-mounting hardware kit
  - Four large retaining screws
  - Two rail support brackets
  - One rear-mounting bracket
  - Two cable-restraint brackets
- **B** Left and right rack rails with rack brackets
- **C** Cable-management arm pins
- **D** Two cable-management arm brackets (one for left-side installation, one for right-side installation)
- **E** Cable-management arm

If there are incorrect, missing, or damaged parts, contact:

- Your IBM reseller
- IBM Rochester Manufacturing Automated Information Line at 1-800-300-8751 (United States only)
- Directory of worldwide contacts Web site at http://www.ibm.com/planetwide (Locate your service and support telephone numbers.)

3. Locate the rack-mounting hardware kit **(A)**, and the rack rails **(B)** that were included with your system unit as shown in Figure 33 on page 39.

   The system rails **(B)** are front-to-back and left-to-right side dependent. The rails are labeled left and right to indicate their placement when you face the front of the rack. The back of each rail has two large latch assemblies. These latch assemblies go in the back of the rack.

4. Determine where you will locate the system unit in the rack. See "Determining the location" on page 27.

Determining the location

You might need to determine where to install the system in the rack. Use this procedure to perform this task.

Before installing the system unit into a rack, complete the following steps:

1. Read the "Rack safety notices" on page 96.
2. Plan where you will place the units. Place the larger and heavier units in the lower part of the rack.

   This system unit is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 7 in. (177.8 mm) high and covers 12 mounting holes in the rack.

3. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit.

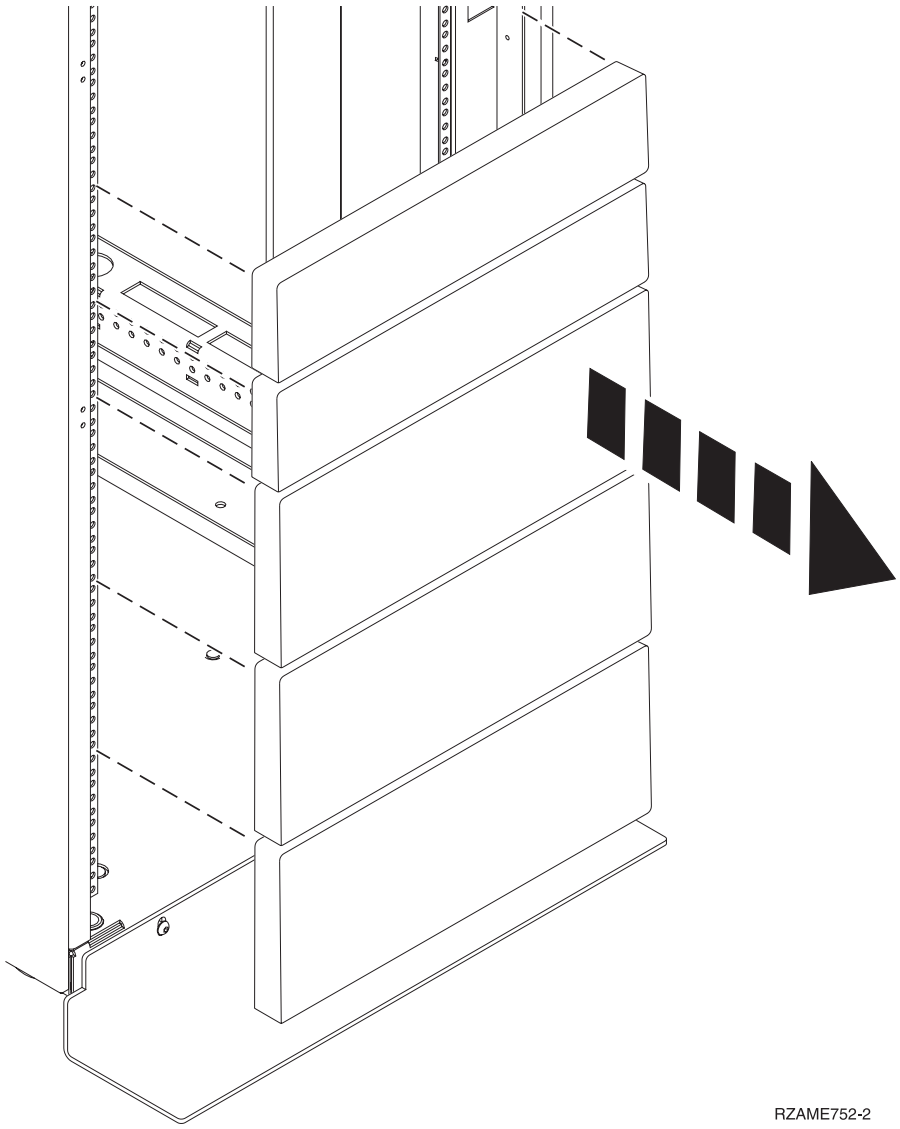


Figure 34. Removing the filler panels

4. If necessary, remove the front and back rack doors.
5. Mark the location: see "Marking the location" on page 28.

Marking the location

You might need to mark the installation location. Use this procedure to perform this task.

To mark the installation location and install the nut clips into a rack without using the rack-mounting template, complete the following steps:

1. Determine where in the rack to place the system. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack. Record the EIA location. The system is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system therefore is 7 in, (177.8 mm) high and covers 12 mounting holes in the rack.
2. Facing the front of the rack and working from the right side, place a self-adhesive dot next to the bottom hole of the bottom EIA unit of the four you will be using for this system unit (**A** in Figure 21 on page 29).

Note: The self-adhesive dots are used to aid in identifying locations on the rack. If you do not have the dots, use some other form of marking tool to aid you in identifying hole locations (for example, tape or a marker). You need to identify the marked hole from both the front and back of the rack.

3. Place another self-adhesive dot next to the bottom hole of the bottom EIA unit on the left side of the rack.
4. Go to the back of the rack. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.

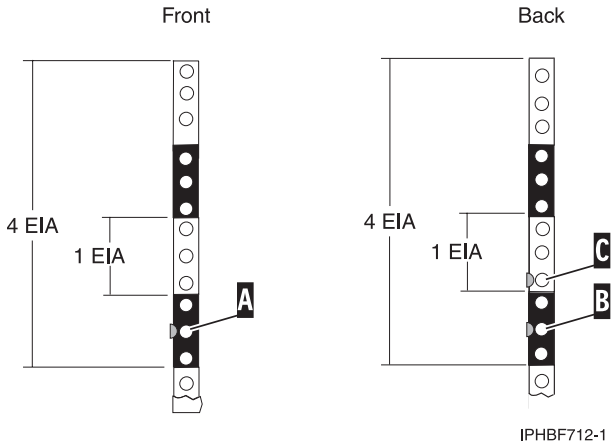


Figure 35. Marking holes on the front and back of the rack frame

5. Place a self-adhesive dot at the middle hole of the bottom EIA unit (**B** in Figure 21 on page 29).
6. Place a self-adhesive dot at the bottom hole of the next (higher) EIA unit (**C** in Figure 21 on page 29).
7. Mark the corresponding holes on the left side of the rack.

Attaching 8203-E4A, 9407-M15, or 9408-M25 mounting hardware to the rack

You might need to attach the mounting hardware to the rack. Use this procedure to perform this task. In addition to information intended to promote safety and reliable operation, you can also find illustrations of the related hardware components that show how these components relate to each other.

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 used on your rack. Do not install mismatched hardware using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller. Also, to install the rails correctly, perform each task in the following order.

To install the rack-mounting hardware into the rack, complete the following steps:

1. With the right rail, pull back the latch assembly release tab (**A** in Figure 36 on page 43), and then slide tab **(B)** back to the retracted position and lock the latch assembly. The back-alignment pins should be fully retracted.
2. After the alignment pins are retracted, insert the right side rail's front-alignment pin as shown in Figure 36 on page 43, into the rack front flange hole identified by the self-adhesive placement dot that you previously installed. Have a second person hold the rail securely in the front hole.

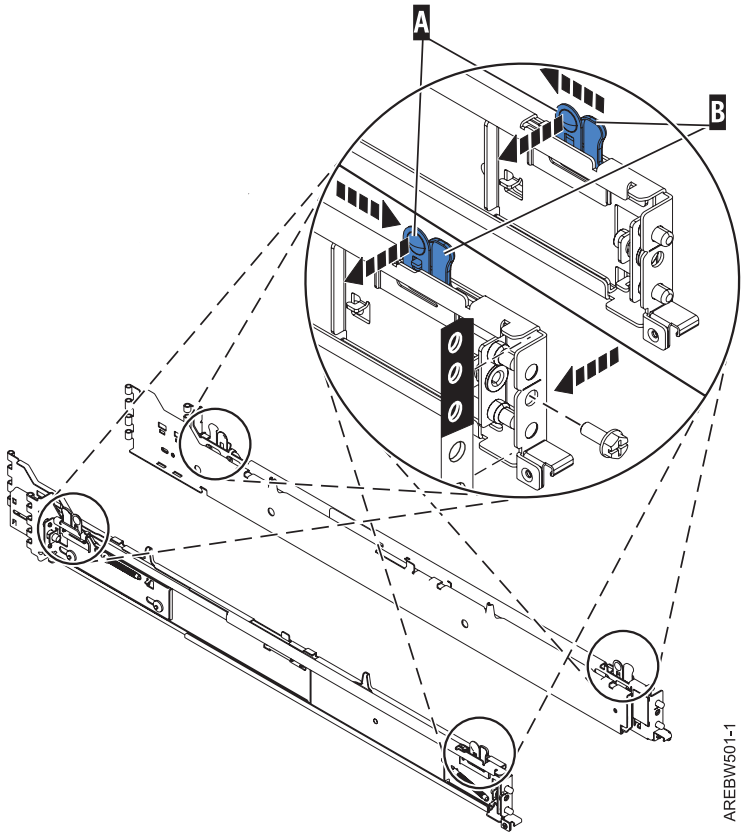


Figure 36. Front slide rail alignment pin, retaining screws, and latch bracket

3. Align the back-alignment pins of the rail with the holes at the back of the rack identified by the self-adhesive placement dots on the back of the rack. The back EIA location will be one position higher than the front rail position. Ensure that the rails are level.
4. Slide the release tab, **(B)**, to extend the two back-alignment pins into the back of the rack. Ensure that the pins have passed through the correct holes in the rack frame.
5. From the back of the rack, insert one of the large rail-retaining screws into the hole that is located between the two back alignment pins. Partially tighten the screw. Do not tighten completely at this time.
6. Install the rail support brackets as shown in Figure 37 on page 44.

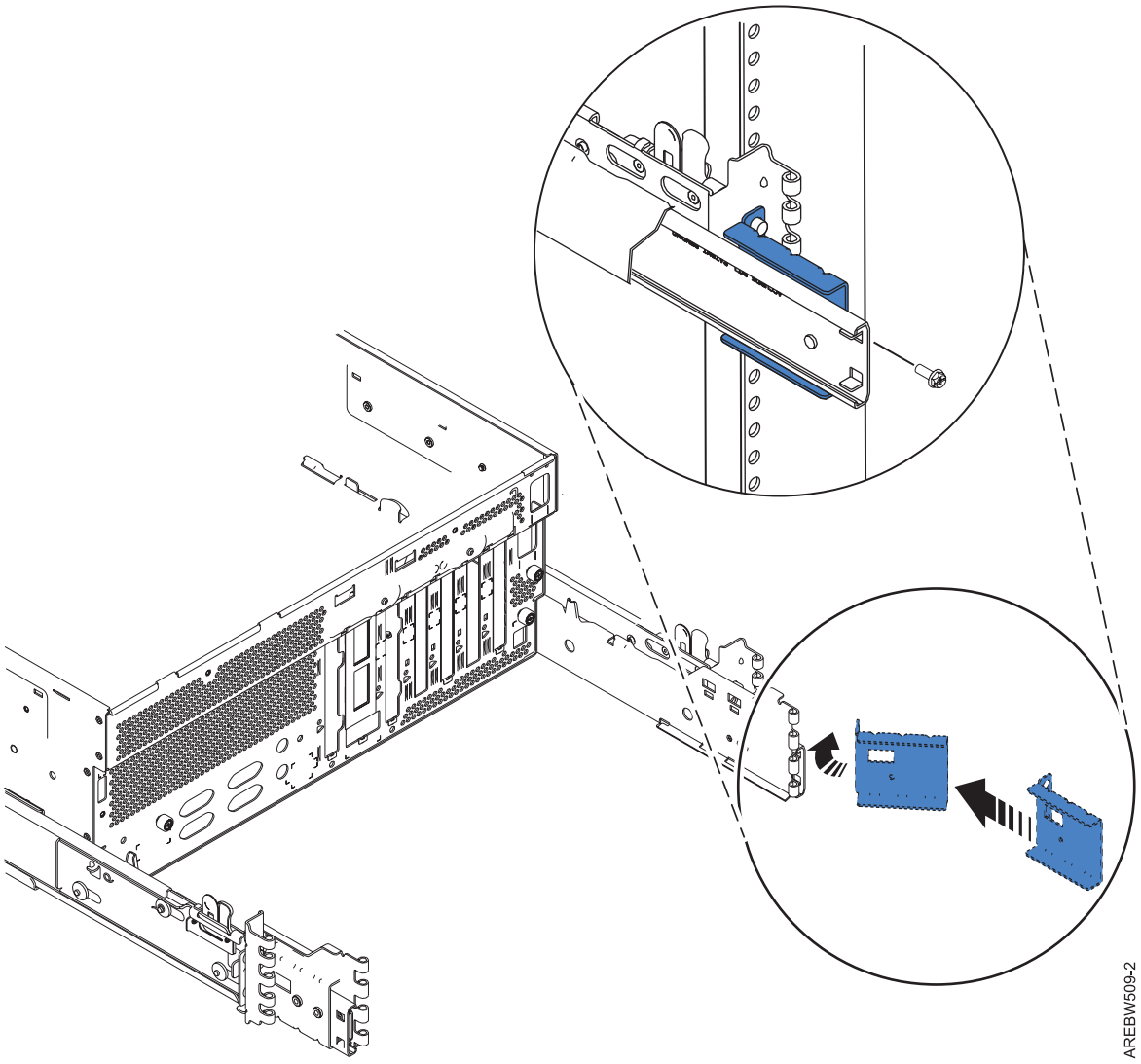


Figure 37. Installing the rail support brackets

7. Repeat steps 1 on page 42 through 5 on page 43 for the left side rail.
8. Extend the inner rails by pulling the rails out. They should be extended from the frame as the rails shown in Figure 39 on page 46.
9. Install the rear support bracket by placing over tabs in the rails and sliding backwards as shown in Figure 38 on page 45. This bracket adds rigidity to the slides.

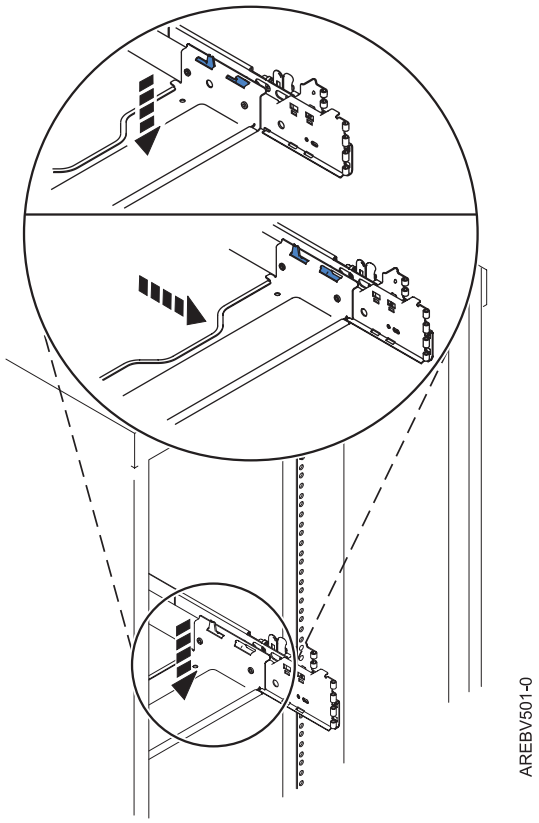


Figure 38. Installing the rear support bracket

10. Using three people, grasp the two handles located on each side of the system drawer and place the system onto the inner rail as shown in Figure 39 on page 46.

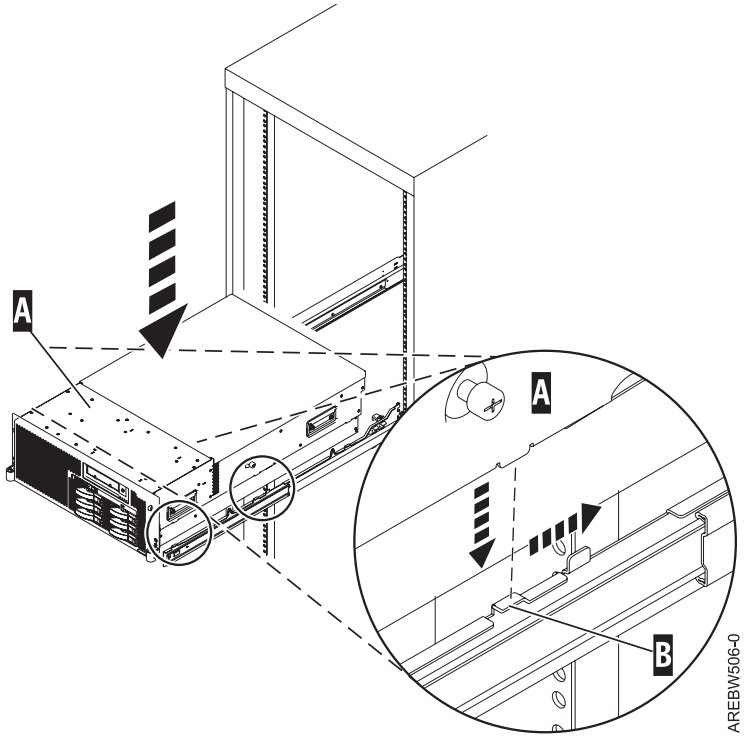


Figure 39. Place system onto the rails

11. After the system is firmly in place, simultaneously press the safety latches and push the system unit into the rack as shown in Figure 40.

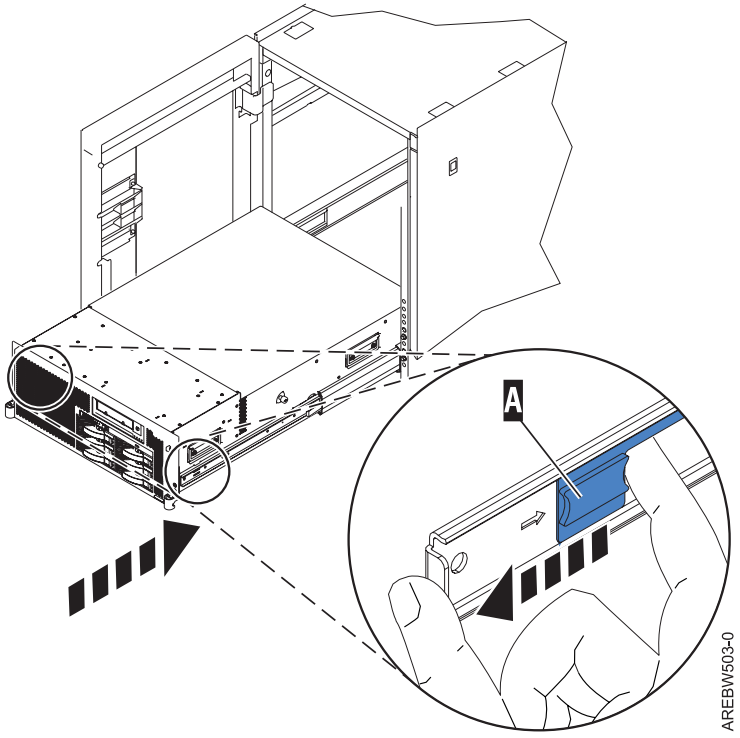


Figure 40. Inner rail extended

12. Use the retaining screws to attach the rack latches to the rack as shown in Figure 41.

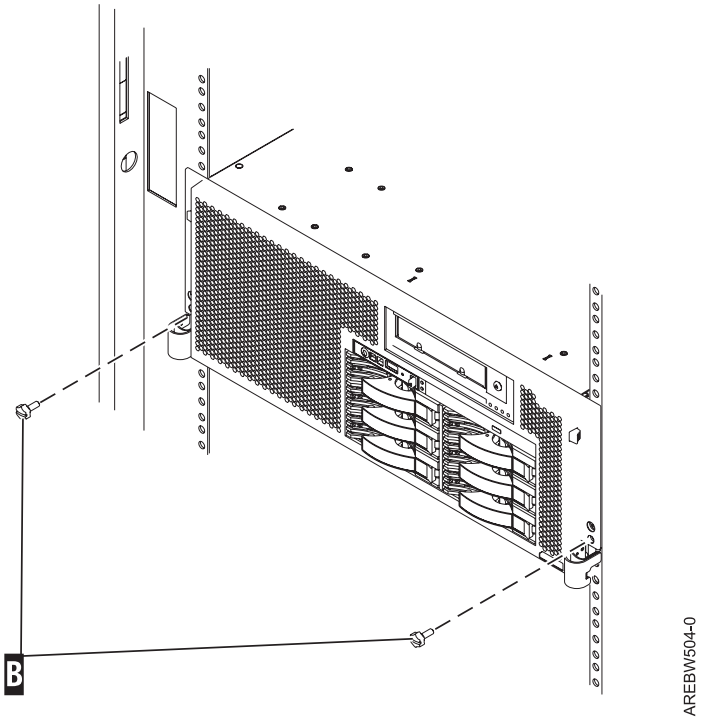


Figure 41. Secure system to rack through rack latches

13. After both rails have been installed, ensure that none of the rail's retaining screws are more than finger-tight. The rails *must* be level from front to back and from left to right.

Installing the cable-management arm

You might need to install the cable-management arm. Use this procedure to perform this task.

To install the cable-management arm, complete the following steps:

1. Determine on which side of the rack you want to install the cable-management arm.
2. Place the correct arm bracket (Left or Right) with the cable-management arm.
3. Use pin **F** to pin the cable-management arm **E** to the rack frame **D** as shown in Figure 31 on page 37.

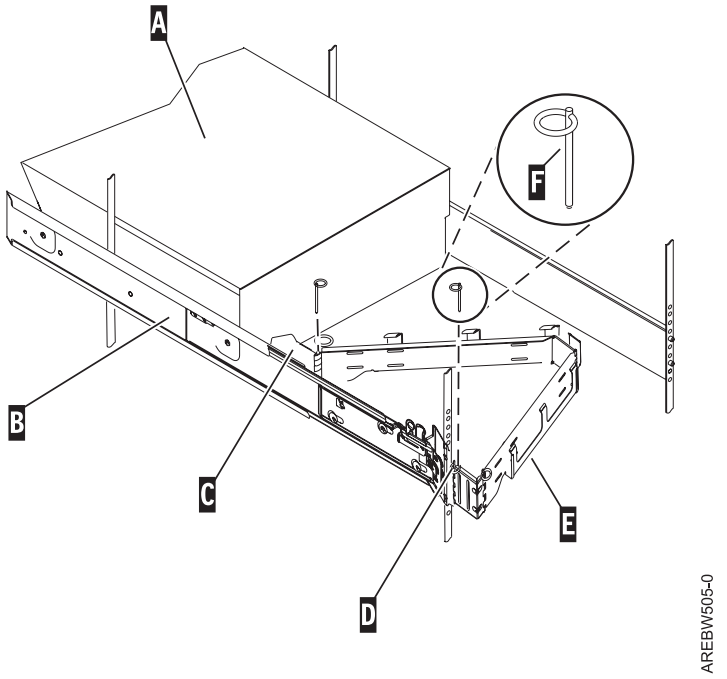


Figure 42. Attaching the cable-management arm.

Tip: If access to the back of the rack is obscured by a large number of existing cables, it might be easier to remove the small connecting hinge from the cable-management arm and attach it first. Then, you can attach the remaining section of the cable-management arm to the connecting hinge.

4. Use the second pin **F** to pin the other end of the cable-management arm to the flange **C** that is attached to the sliding portion of the left system rail assembly **B** as shown in Figure 31 on page 37.

Determining power cord, plug, and receptacle type

To determine what power cord, plug, and receptacle type your server or system requires, you need to know the country or region in which your server or system will reside, your server or system model, and the voltage and amperage of your power supply.

See Modification of IBM Cords for recommendations regarding the alteration of power cords.

Tip: Print the **Plug and receptacle type** table for your server or system and give it to your electrician. The table contains information needed to install the proper receptacle for your system expansion unit.

The server or system and all of the expansion units and attached equipment will require an isolated power supply. This means, it must have its own circuit. Use an uninterruptible power supply to help protect both the server and its data.

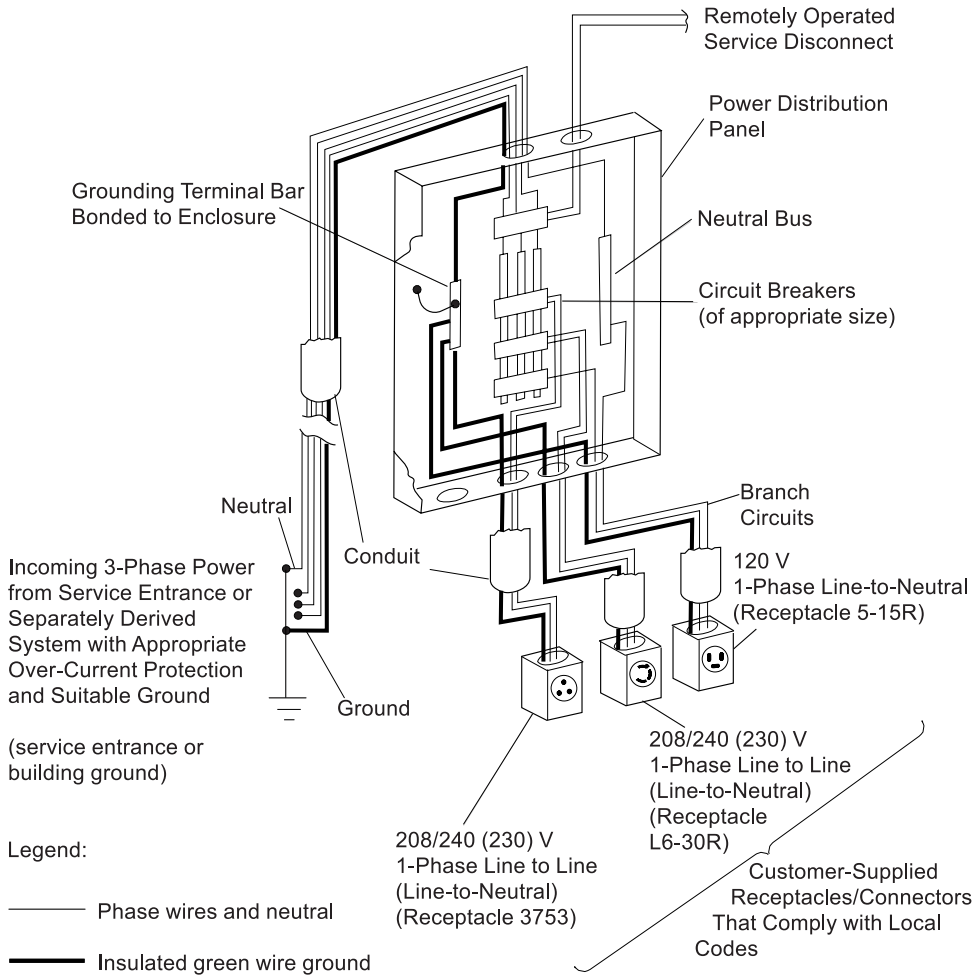


Figure 43. Typical power distribution system that is grounded properly

With this information, you can determine your type through these tables:

Installing the 0595, 5095, or 7311-D20 expansion unit into a rack

You might need to install an expansion unit into the rack. Use this procedure to perform this task. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are provided, and these show how the components relate to each other.

This procedure assumes that you are installing the model 0595, 5095, or 7311-D20 expansion unit into an existing rack. If the rack is not installed, follow the instructions in Chapter 2, "Installing the rack," on page 3, and then return to this procedure for instructions on installing the expansion unit into the rack.

Note: This procedure applies only to the models that are designed to be mounted in a rack. Do not attempt to install a stand-alone model in a rack.

To install the 0595, 5095, or 7311-D20 into a rack, complete the following steps:

1. Read the "Rack safety notices" on page 96.

2. Unpack the template and rack hardware.

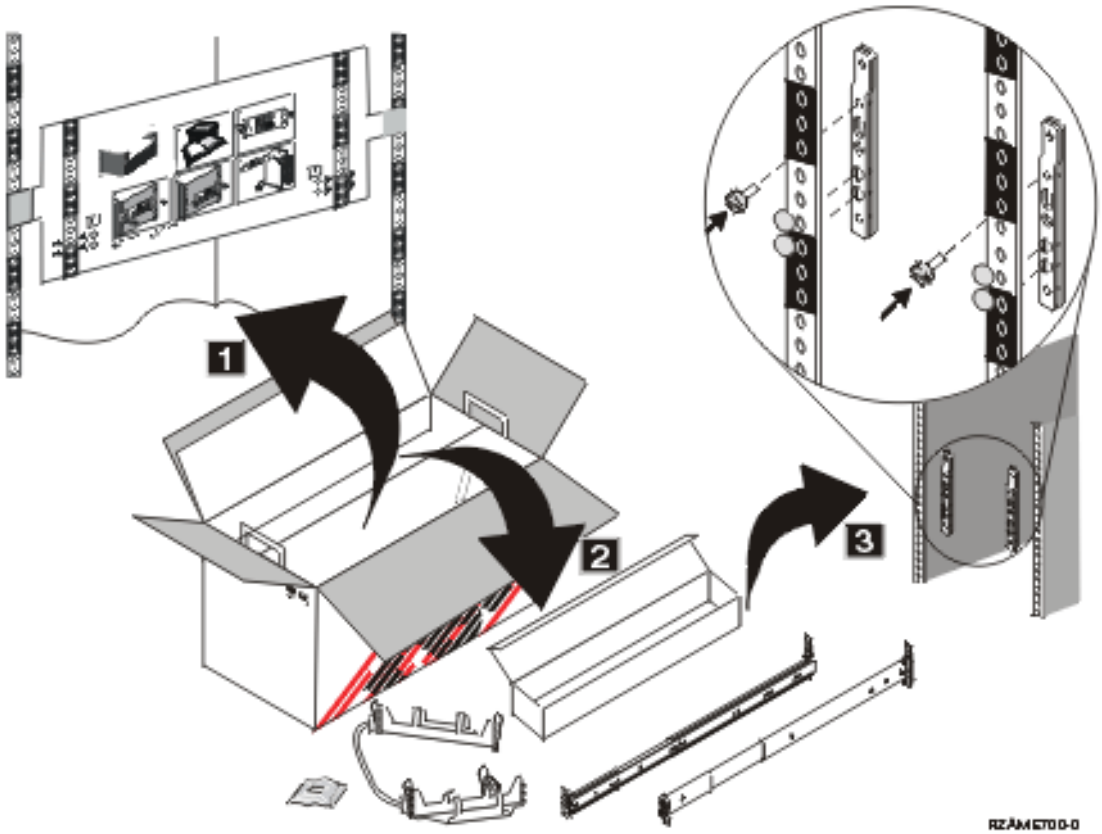


Figure 44. Unpacking the rack template and hardware

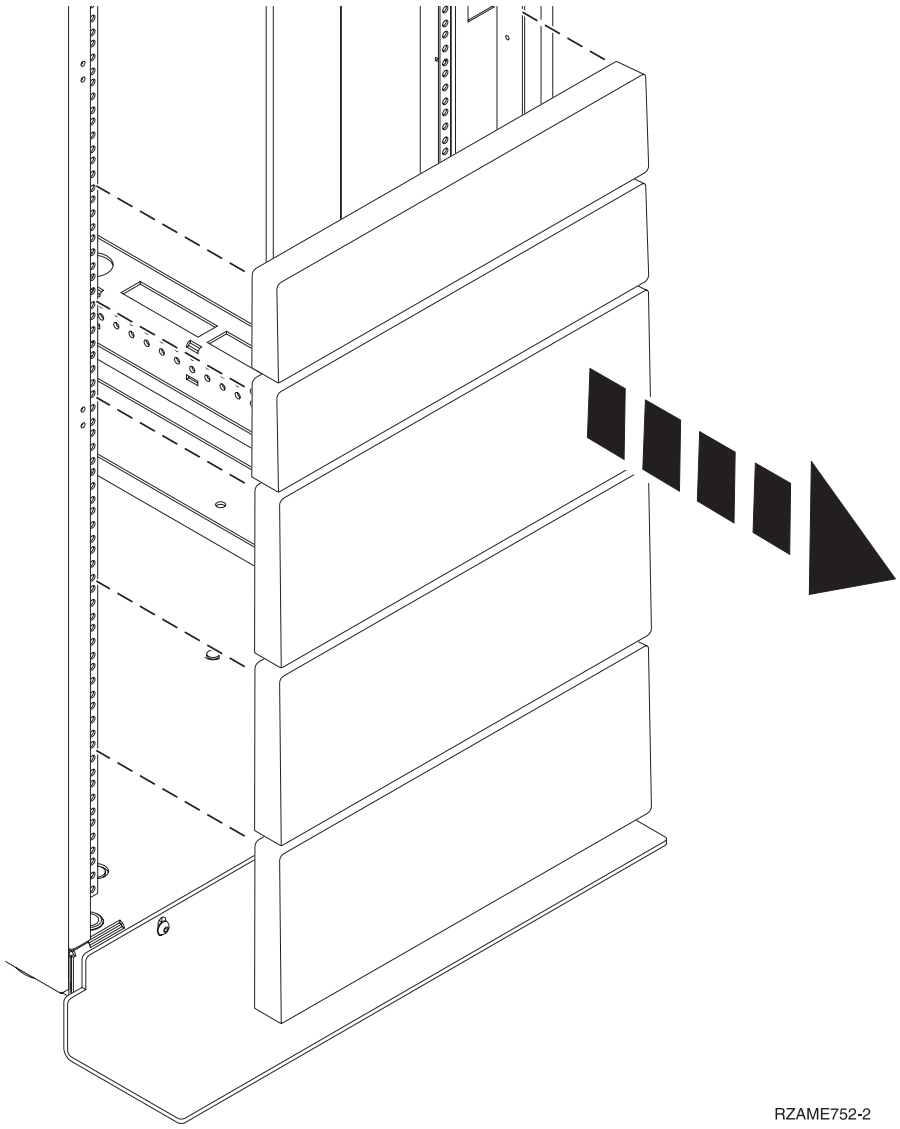
3. Complete a parts inventory (See "Completing a parts inventory" on page 82).
4. Determine where the expansion unit should be located in the rack. See "Determining the location."
5. Mark the location. See "Marking the location without a rack-mounting template" on page 53.

Determining the location

You might need to determine where to install an expansion unit in the rack. Follow this procedure to perform this task either with or without the aid of a rack-mounting template.

Before installing the system unit or expansion unit into a rack, complete the following steps:

1. Plan where you will place the units. Place the larger and heavier units in the lower part of the rack.
2. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit.

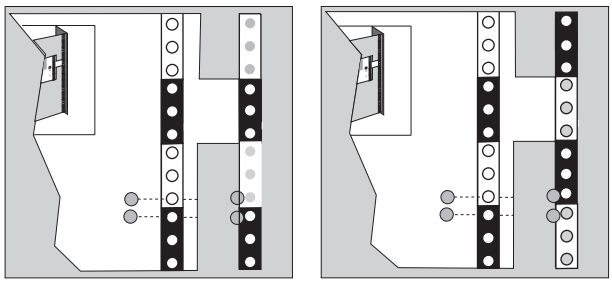


3. If necessary, remove the front and back rack doors.
4. Use one of these procedures to mark the location:
   a. If you have a rack-mounting template, see "Marking the location using a rack-mounting template."
   b. If you do not have a rack-mounting template, see "Marking the location without a rack-mounting template" on page 53.

Marking the location using a rack-mounting template

You may want to mark the installation location by using a rack-mounting template. Follow this procedure and use the rack-mounting template as a tool to perform this task.

1. Using the rack-mounting template, determine where in the rack to place the unit. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack.



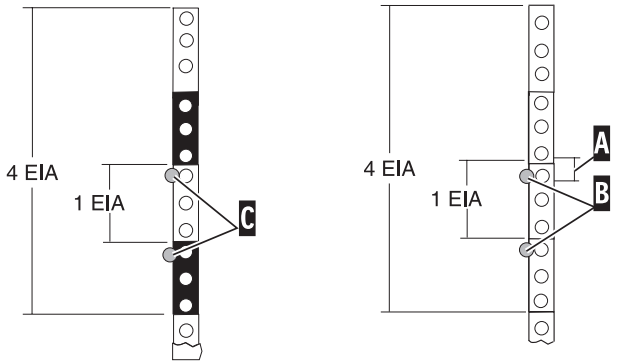
IPHBF502-0

Figure 45. Rack-mounting template

Note: The front of the rack-mounting template has printed illustrations designed to help you identify the mounting holes to be used when you add units to the rack. *Do not* use the rack-mounting template without completing the following steps.

2. Note the following when using the rack-mounting template:
   - Each black or white unit on the template is equal to one Electronic Industries Alliance (EIA) unit.
   - An EIA unit is 1.75 in (44.45 mm) in height.
   - The rack contains three mounting holes for each EIA unit of height.
   - The EIA units illustrated on the template must be aligned with the EIA units located on the rack.
   - It is not necessary to align like-colored EIA units. For example, a black EIA unit on the rack-mounting template can be aligned with a white EIA unit located on the rack.
   - The template is two-sided. When using the template, ensure that the appropriate side of the template is facing out.

   Figure 46 shows one EIA unit and four EIA units. Depending on the rack manufacturer, the EIA units might be separated either by color or by a line. Notice that the holes along the rail are not evenly spaced. If your rack has no color or line separation between EIA units, assume that each EIA unit begins where the hole spacing **A** is closest together.



IPHBF503-0

Figure 46. EIA units

To use the rack-mounting template, complete the following steps:

a. Remove the protective coating from each adhesive strip located on the back of the rack-mounting template. Lightly press the template into position on the rack. Ensure that both the left and right sides are at the corresponding EIA locations.

Note: The tabs on each side of the template show a notch to indicate the proper spacing between the front flanges.

b. Locate the dots, printed on the left and right side of the template. Place a self-adhesive dot directly across from the template's printed dots on or near the rack's EIA numbering strip. You will be using these dots to aid in correctly positioning the rail-alignment pins located on the front of each rail.

c. Remove the rack-mounting template from the front of the rack. The front of your rack should now contain dots.

d. Mount the rack-mounting template to the rack's back EIA frame. Place the rack-mounting template at the same EIA-numbered location that was used on the front of the rack.

e. Wrap a self-adhesive dot directly across from the template's printed dots. Ensure that a portion of the self-adhesive dot wraps around the rack frame so that it can be seen from the front of the rack.

f. Remove the rack-mounting template from the back of the rack. The back of your rack should now contain dots that have been partially wrapped around the frame.

3. Attach the rail assembly to the rack. See "Installing the 0595, 5095, or 7311-D20 rails into the rack."

Marking the location without a rack-mounting template

You might need to mark the location without a template. Use this procedure to perform this task.

To mark the installation location without using a rack-mounting template, complete these steps:

1. Determine where in the rack to place the system. Record the location.

   This unit is five Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This drawer therefore is 8.75 in. (222.25 mm) high and covers 15 mounting holes in the rack.

2. Facing the front of the rack and working from the right side, place a supplied self-adhesive dot next to the top hole of the bottom EIA unit.

   Note: The self-adhesive dots are used to aid in identifying locations on the rack. If you no longer have any of the dots, use some other form of marking tool to aid you in identifying hole locations (for example, tape, a marker, or pencil).

3. Place another self-adhesive dot next to the bottom hole of the next (above) EIA unit.
4. Repeat steps 2 through 3 for the corresponding holes located on the left side of the rack.
5. Go to the back of the rack. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.
6. Place a self-adhesive dot at the middle hole of the bottom EIA unit.
7. Place a self-adhesive dot at the middle hole of the next (above) EIA unit. There will be two holes between the two dots.
8. Mark the corresponding holes on the left side of the rack.
9. Attach two nut clips to the left side of the rack.

   a. Put the first nut clip in the top hole of the third EIA unit. There will be three holes between this nut clip and the highest dot on the left side.

   b. Put the second nut clip in the middle hole of the fourth nut clip. There will be one hole between the two nut clips.

Installing the 0595, 5095, or 7311-D20 rails into the rack

You might need to install rails into a rack. Use this procedure to perform that task. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are provided and show how these components relate to each other.

To install the rails into the rack, complete the following steps:

1. Using two screws **(A)**, attach the left rail assembly to the front of the rack.

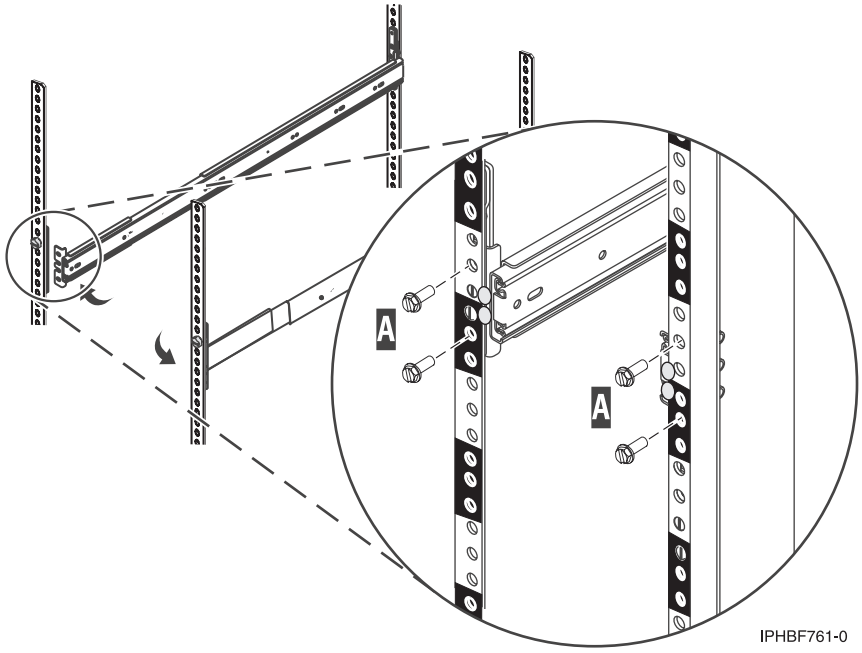


Figure 47. Attaching the rails to the front of the rack

2. Using two screws **(A)**, attach the right rail assembly to the front of the rack.
3. Move to the back of the rack.
4. Extend the left and right rails.
5. Using two screws **(B)**, attach the left rail assembly to the back of the rack.

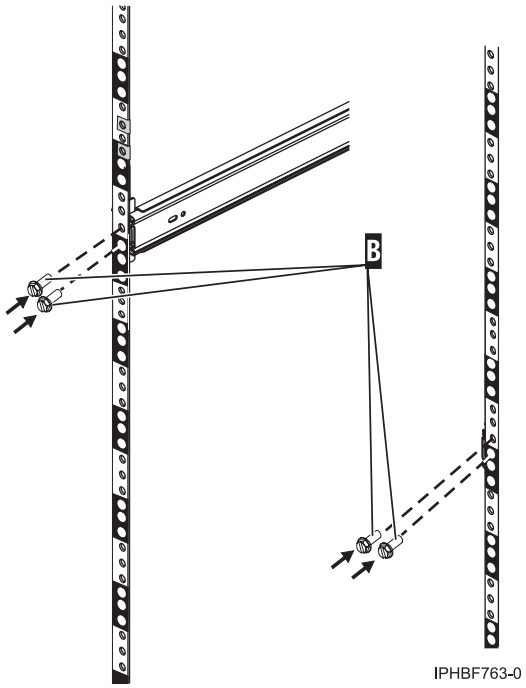


Figure 48. Attaching the rails to the back of the rack

6. Using two screws **(B)**, attach the right rail assembly to the back of the rack.

Installing the 0595, 5095, or 7311-D20 expansion unit into a rack

You might need to install an expansion unit into a rack. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are also provided and show how these components relate to each other.

To install the expansion unit into a rack, complete the following steps:

Attention: This expansion unit weighs in excess of 100 pounds (45 kg). A minimum of three people are required to lift the unit and install it on the rails.

1. Using four screws **(A)**, install the rail-mounting guides **(B)** to the left and right side of the expansion unit chassis.

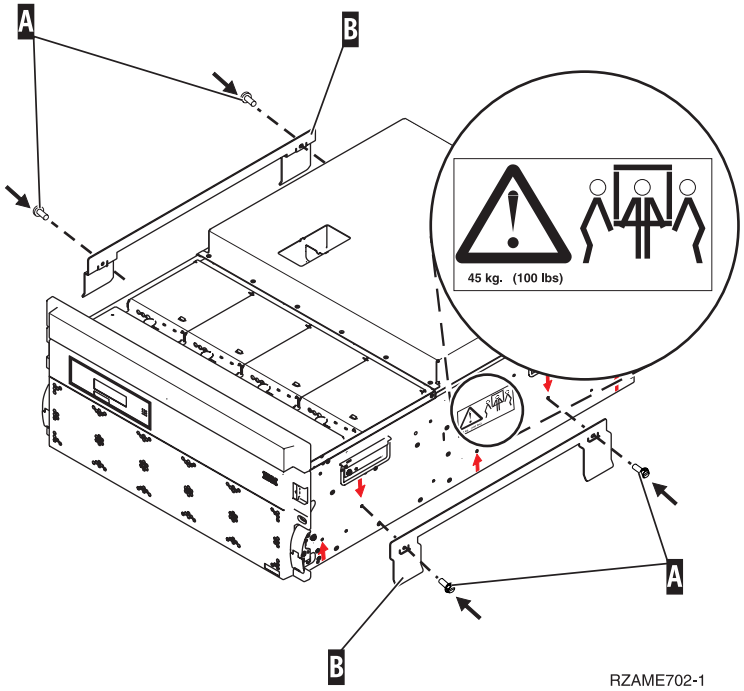


Figure 49. Attaching the rail-mounting guides

2. Extend the rails from the rack until they lock into place.
3. Using at least three people, lift the expansion unit onto the rails. The rail guides **(B)** go over the rails.
4. Align the mounting holes on the chassis with their corresponding holes on the rail.
5. Install the six screws **(C)** through the rails and secure the screws to the expansion unit chassis.

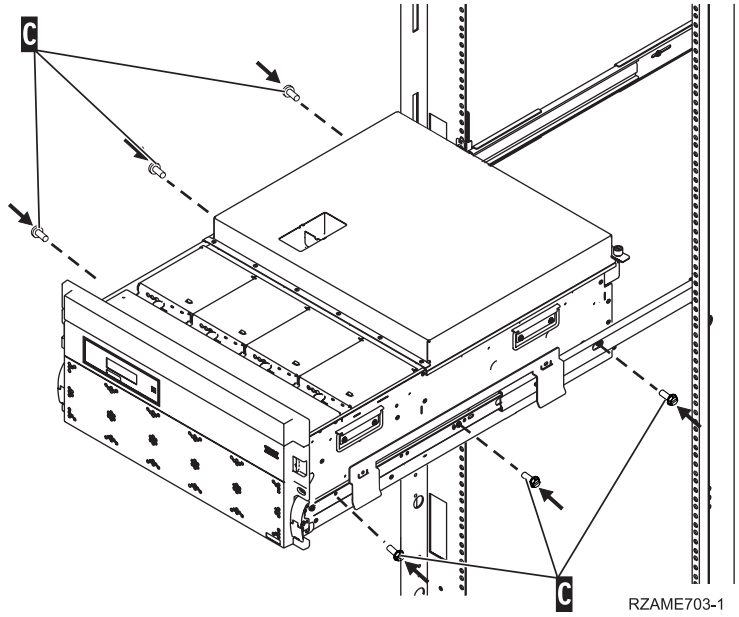


Figure 50. Installing the expansion unit onto the rails

6. Remove the four screws **(A)** securing the rail-mounting guides **(B)** to the expansion unit and remove the rail mounting guides.

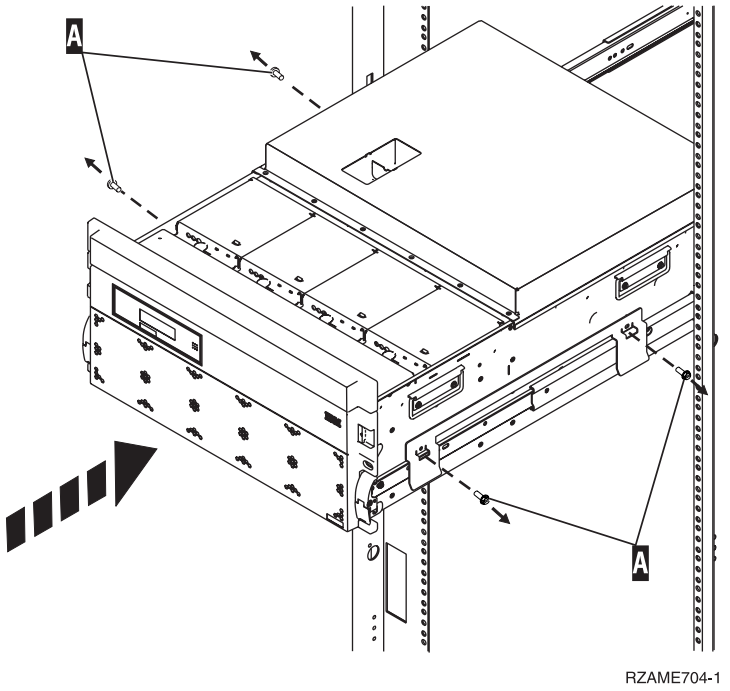


Figure 51. Removing the rail-mounting guides

7. Slide the system approximately three-quarters of the way into the rack so that you can access the back of the system from the back of the rack.
8. Attach one end of the cable-management arm to the back of the rack with two screws **(D)**. Attach the other end of the arm to the back of the expansion unit with two screws **(E)**.

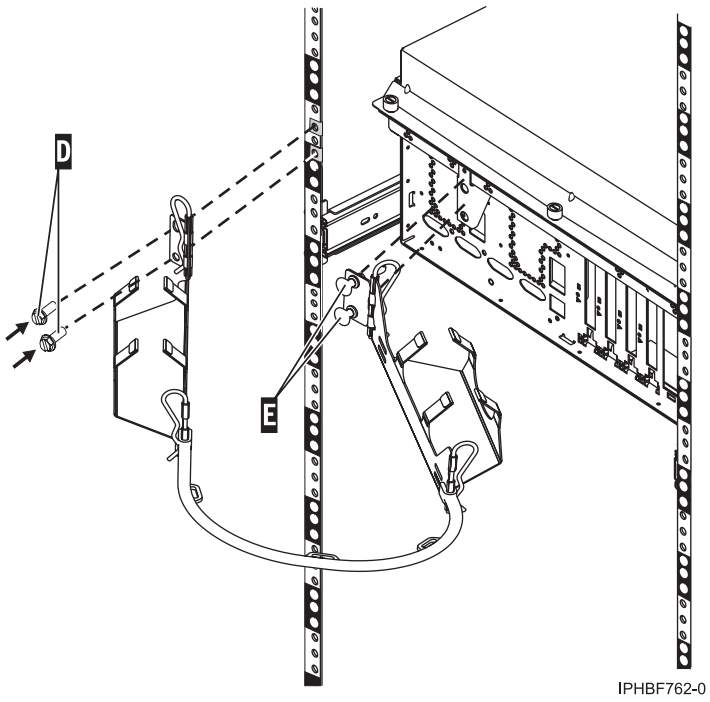


Figure 52. Attaching the cable-management arm

9. Attach the securing screw mounts **(G)** with two screws **(F)** to the left and right rack rails.

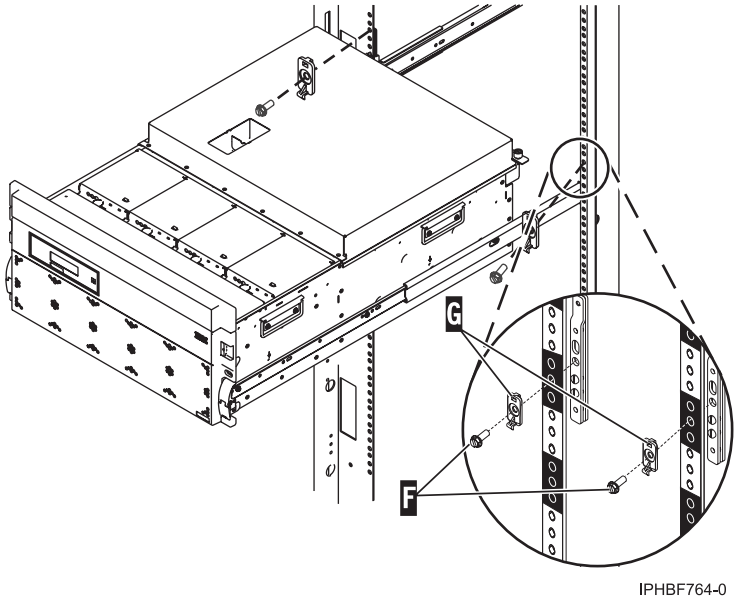


Figure 53. Attaching the securing screw mounts.

10. Slide the expansion unit into and out of the rack slowly to ensure that the expansion unit can slide freely on the rails. If the expansion unit cannot slide freely on the rails, then slide the expansion unit out toward the front, loosen the six screws **(C)** an eighth of a turn, and then slide the expansion unit into and out of the rack slowly until the expansion unit slides freely on the rails. Slide the expansion unit out toward the front and retighten the six screws **(C)**.

11. Slide the expansion unit completely into the rack.

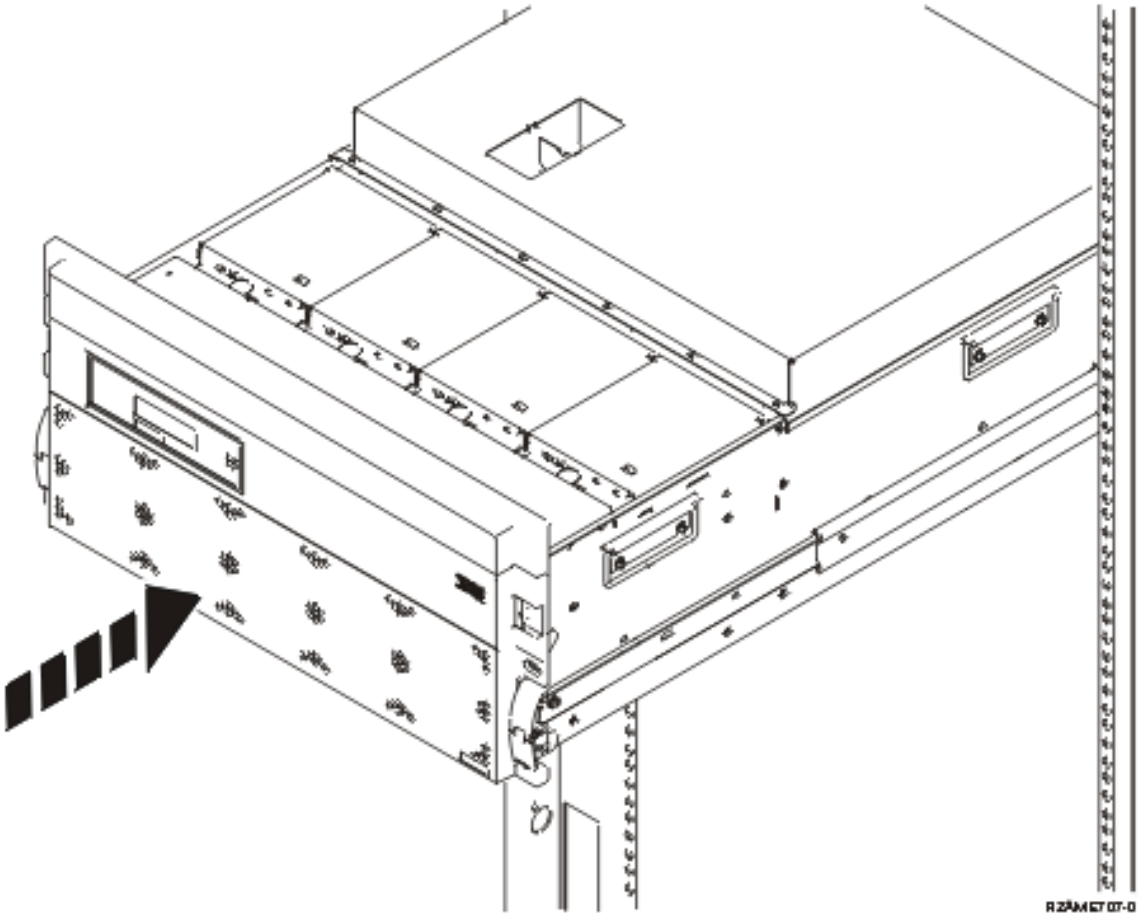


Figure 54. Sliding the expansion unit into the rack

12. If the system will be transported, install the two securing screws though the front of the expansion unit and into the securing screw mounts.

Installing the model 5802, 5877 or 5886 into a rack

This procedure can be used to install the system into a rack. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are provided to show how these components relate to each other.

Installing the system into a rack is a customer task. You can perform this task yourself, or contact a service provider to perform the task for you. You might be charged a fee by the service provider for this service.

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

This procedure assumes that you are installing the system into an existing rack. If the rack is not installed, go to the instructions for Chapter 2, “Installing the rack,” on page 3 and then return to this procedure for instructions on installing the system unit in a rack.

Note: This procedure applies only to the models that are designed to be mounted in a rack. Do not attempt to install a stand-alone model in a rack.

To install the model 5802, 5877, or 5886 into a rack, complete these steps:

CAUTION:
Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

1. Read the "Rack safety notices" on page 96.
2. Complete a parts inventory, if you have not done so.

   Note: For this installation you will need a 5 mm (3/16-in.) flat-blade screwdriver during the installation. A #2 Phillips screwdriver and an 8 mm wrench are optional.

   Here is a list of items that you need to install the unit in the rack cabinet:

   - Rail assembly, right (1)
   - Rail assembly, left (1)
   - M5 screws (8)
   - Small diameter spacers (8) (these come installed, four in each rail)
   - Large diameter spacers (8)

     Note: These are used with square mount racks only.
   - M4 pan-head screws (2)
   - 15 mm (0.60 in.) diameter washers (6)

     Note: These are used with square mount racks only.

   If there are incorrect, missing, or damaged parts, contact:

   - Your IBM reseller
   - IBM Rochester Manufacturing Automated Information Line at 1-800-300-8751 (United States only)
   - Directory of worldwide contacts Web site at http://www.ibm.com/planetwide (Locate your service and support telephone numbers.)
3. Locate the rack-mounting template, the rack-mounting hardware kit, and the system rail assemblies that were included with your system unit .

   The system rails are front-to-back and left-to-right side dependent.
4. Determine where you will locate the system unit in the rack. See "Determining the location."

Determining the location

You might need to determine where to install an expansion unit in the rack. Follow this procedure to perform this task either with or without the aid of a rack-mounting template.

Before installing the system unit into a rack, complete the following steps:

1. Read the "Rack safety notices" on page 96.
2. Plan where you will place the units. Place the larger and heavier units in the lower part of the rack.

   Note:

   - The 5802 and 5877 expansion units are four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.50 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 7.0 in. (178 mm) high and covers 12 mounting holes in the rack.
   - The 5886 expansion unit is two Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.50 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 3.5 in. (89 mm) high and covers 6 mounting holes in the rack.

3. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit.

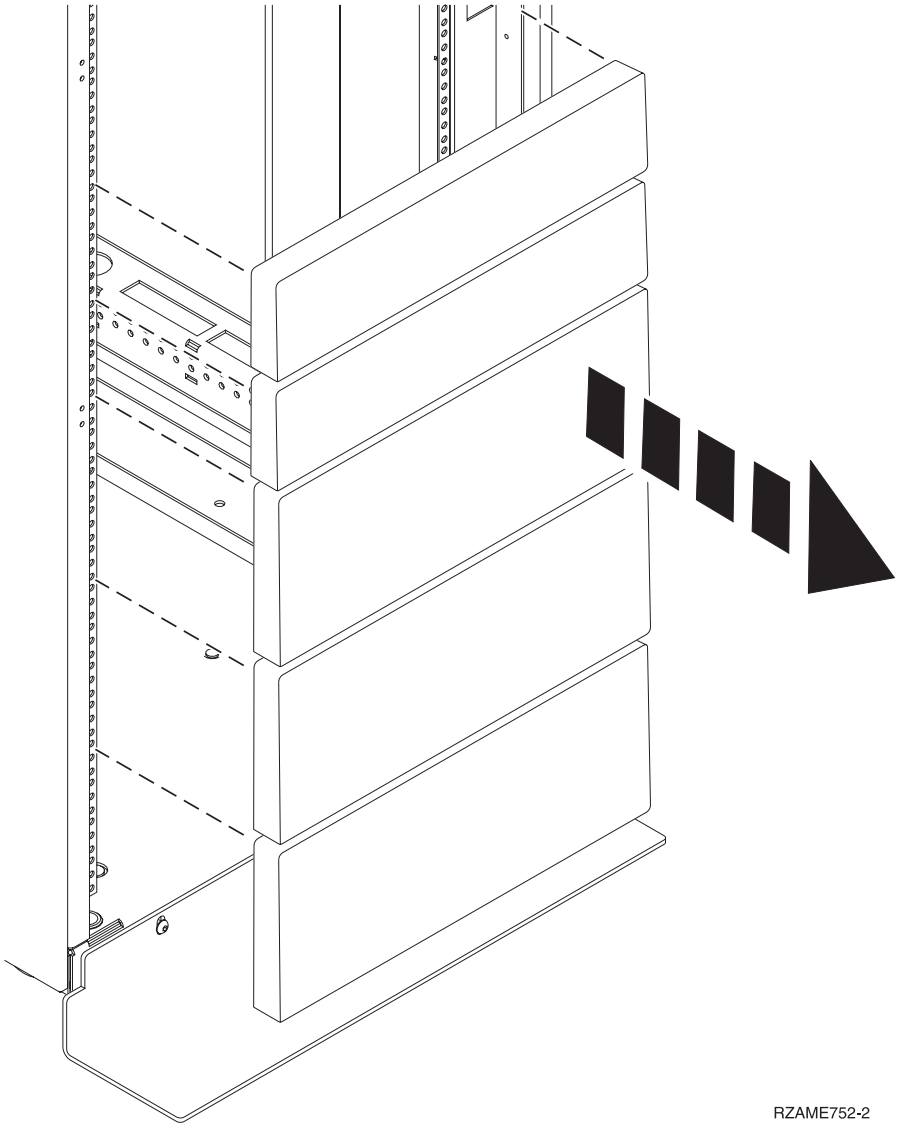


Figure 55. Removing the filler panels

4. If necessary, remove the front and back rack doors.
5. Use one of these procedures to mark the location:
   a. If you have a rack-mounting template, see "Marking location by using the rack-mounting template."
   b. If you do not have a rack-mounting template, see "Marking the location without a rack-mounting template" on page 62.

Marking location by using the rack-mounting template

You may want to mark the installation location by using a rack-mounting template. To mark the location using the rack-mounting template follow these steps.

1. Using the rack-mounting template, determine where in the rack to place the unit. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack.

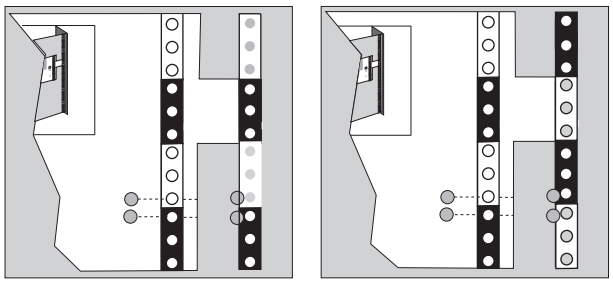


Figure 56. Rack-mounting template

Note: The front of the rack-mounting template has printed illustrations designed to help you identify the mounting holes to be used when you add units to the rack. *Do not* use the rack-mounting template without completing these steps.

2. Note the following when using the rack-mounting template:
   - Each black or white unit on the template is equal to one Electronic Industries Alliance (EIA) unit.
   - An EIA unit is 1.75 in. (44.45 mm) in height.
   - The rack contains three mounting holes for each EIA unit of height.
   - The EIA units that are illustrated on the template must be aligned with the EIA units located on the rack.
   - It is not necessary to align like-colored EIA units. For example, a black EIA unit on the rack-mounting template can be aligned with a white EIA unit that are located on the rack.
   - The template is two-sided. When using the template, ensure that the appropriate side of the template is facing out.

   Figure 57 shows one EIA unit and four EIA units. Depending on the rack manufacturer, the EIA units might be separated either by color or by a line. Notice that the holes along the rail are not evenly spaced. If your rack has no color or line separation between EIA units, assume that each EIA unit begins where the hole spacing is closest together as shown by **(A)** in Figure 57.

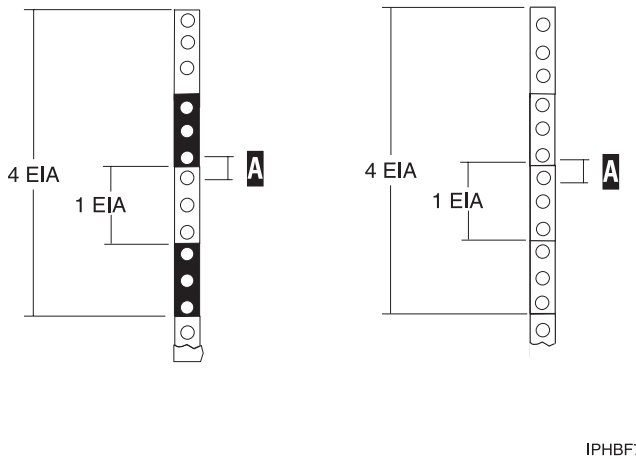


Figure 57. EIA units

To use the rack-mounting template, complete these steps:

a. Remove the protective coating from each adhesive strip located on the back of the rack-mounting template. Lightly press the template into position on the rack. Ensure that both the left and right sides are at the corresponding EIA locations.

Note: The tabs on each side of the template show a notch to indicate the correct spacing between the front flanges.

b. Locate the dots that are printed on the left and right side of the template. Place a self-adhesive dot directly across from the template's printed dots on or near the rack's EIA numbering strip. You will be using these dots to aid in correctly positioning the rail-alignment pins located on the front of each rail.

c. Remove the rack-mounting template from the front of the rack. The front of your rack should now contain dots.

d. Mount the rack-mounting template to the rack's back EIA frame. Place the rack-mounting template at the same EIA-numbered location that was used on the front of the rack.

e. Wrap a self-adhesive dot directly across from the template's printed dots. Ensure that a portion of the self-adhesive dot wraps around the rack frame so that it can be seen from the front of the rack.

f. Remove the rack-mounting template from the back of the rack. The back of your rack should now contain dots that have been partially wrapped around the frame.

Marking the location without a rack-mounting template

You might need to mark the location without using a rack-mounting template. Follow these steps to perform this task.

To mark the installation location and install the nut clips into a rack without a rack-mounting template, complete the following steps:

1. Determine where in the rack to place the system. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack. Record the EIA location.

   Note:

   - The 5802 and 5877 expansion units are four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.50 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 7.0 in. (178 mm) high and covers 12 mounting holes in the rack.
   - The 5886 expansion unit is two Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.50 mm) in height. The rack contains three mounting holes for each EIA unit of height. This system unit therefore is 3.5 in. (89 mm) high and covers 6 mounting holes in the rack.

2. Facing the front of the rack and working from the right side, place a self-adhesive dot next to the middle hole of the bottom EIA unit **(A)** in Figure 58 on page 63.

   Note: The self-adhesive dots are used to aid in identifying locations on the rack. If you do not have the dots, use some other form of marking tool to aid you in identifying hole locations (for example, tape, or a marker). You will need to identify the marked hole from both the front and back of the rack.

3. Place another self-adhesive dot next to the middle hole of the bottom EIA unit on the left side of the rack.

4. Go to the back of the rack. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.

   Note: The following figure is an example of how the EIA units appear, you might have a different configuration or placement.

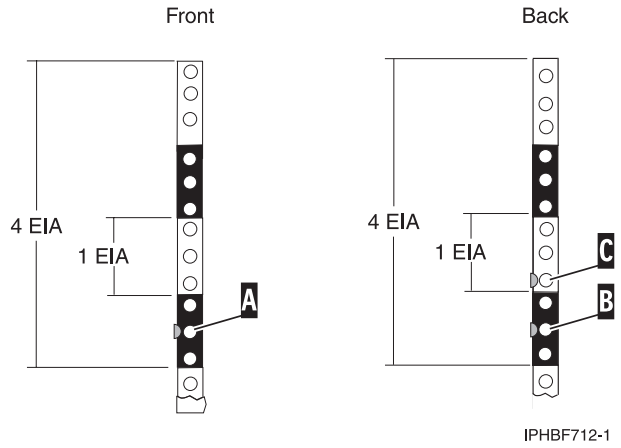


Figure 58. Marking holes on the front and back of the rack frame

5. Place a self-adhesive dot at the middle hole of the bottom EIA unit, **(B)** in Figure 58.
6. Place a self-adhesive dot at the bottom hole of the next (higher) EIA unit, **(C)** in Figure 58.
7. Mark the corresponding holes on the left side of the rack.

Attaching the mounting hardware to the rack

You might need to attach mounting hardware to the rack. Follow these steps to perform this task. In addition to information intended to promote safety and reliable operation, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

CAUTION:
Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

To install the mounting hardware into the rack, follow these steps:

1. Loosen the two rail-adjustment screws on one rail just enough to enable the rails to slide.

   Note: The rails are marked with an **L** or **R** on the front brackets.

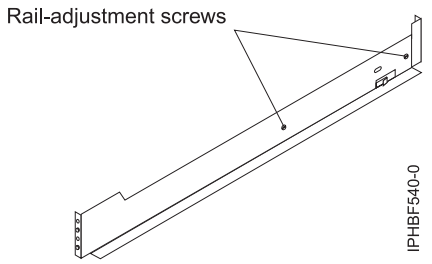
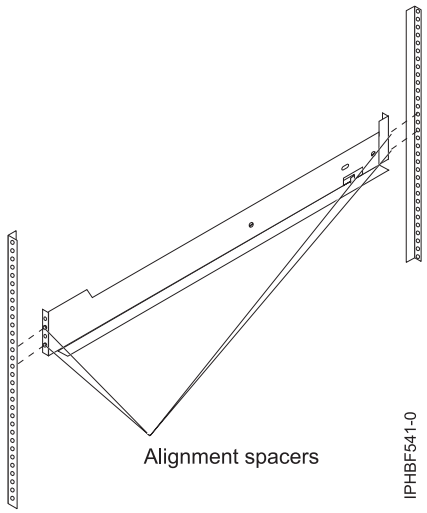


Figure 59. Extending the system rails

2. Align the rail with the inside of the front and rear of the rack cabinet. The bottom of the rail support ledge should be slightly above the U mark on the rack flange.

   The rail comes with two spacers in the front bracket and two spacers in the rear bracket. If the rack has round holes, the spacers on the rail brackets fit into the round holes in the rack flanges. If the rack has square holes, replace the set of small spacers on the front and rear of the rail with the larger spacers that come with the rail kit.



3. Secure the rail to the front of the rack cabinet with one M5 screw in the top hole of the bracket. For racks with square holes, add one washer between the M5 screw and the rail bracket.

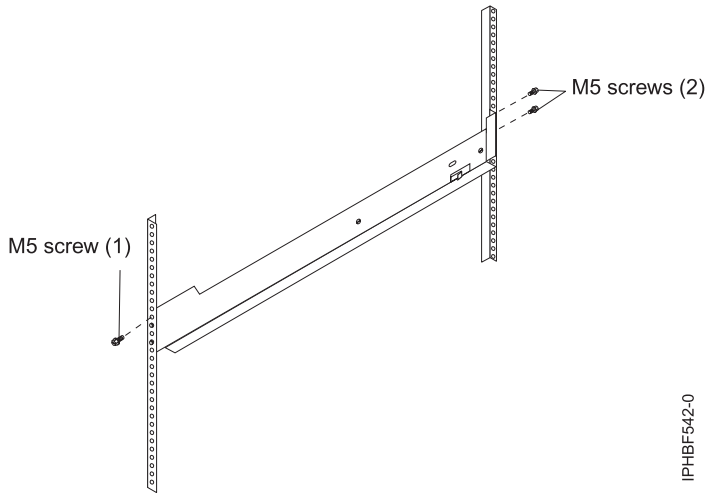


Figure 60. Attaching the system rails

4. Secure the rail to the rear of the rack cabinet with two M5 screws in the top and bottom holes in the rear rail bracket. For racks with square holes, add one washer between each M5 screw and the rail bracket.
5. Tighten the rail-adjustment screws.
6. Repeat step 1 through step 5 for the other rail.

Installing the 5802, 5877 or 5886 on the rail assembly

You might need to install the system on the rail assembly. Use the steps detailed in this procedure to perform this task. In addition to related safety information, illustrations of the related hardware components are provided.

Before installing the system on the rail assembly, ensure that the stabilizers are extended and the tip plate is attached to the bottom front of the rack to prevent the rack from falling forward when the rails are pulled out of the rack. Refer to “Rack safety notices” on page 96.

To install the system unit on the rail assembly, follow these steps:

1. (Optional) To reduce the weight of the unit for easier installation in the rack cabinet, remove the power supplies. To remove a power supply, complete the following steps:
   a. On the left side of a power supply, press the orange release tab to the right just enough to release the handle [no more than 6.4 mm (0.24 in.)] as you rotate the handle downward.

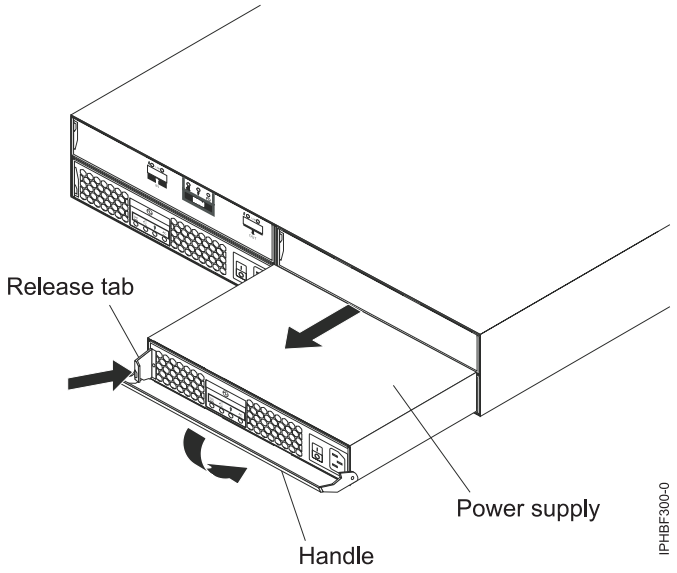


Figure 61. Removing power supplies

   b. Carefully slide the power supply out of the unit.
   c. Repeat this step for the other power supply; then, set both units aside for later installation.
2. (Optional) To reduce the weight of the unit for easier installation in the rack cabinet, remove the hard disk drives. To remove a hard disk drive, press the latch and pull out the handle; then, carefully pull the drive from the unit. Repeat this step for all hard disk drives.

   Note:

   a. Before you remove any hard disk drives, make sure that you mark their locations so that you can reinstall them in the same locations.
   b. Handle hard disk drives gently and do not stack them. Follow all precautions for static-sensitive devices.

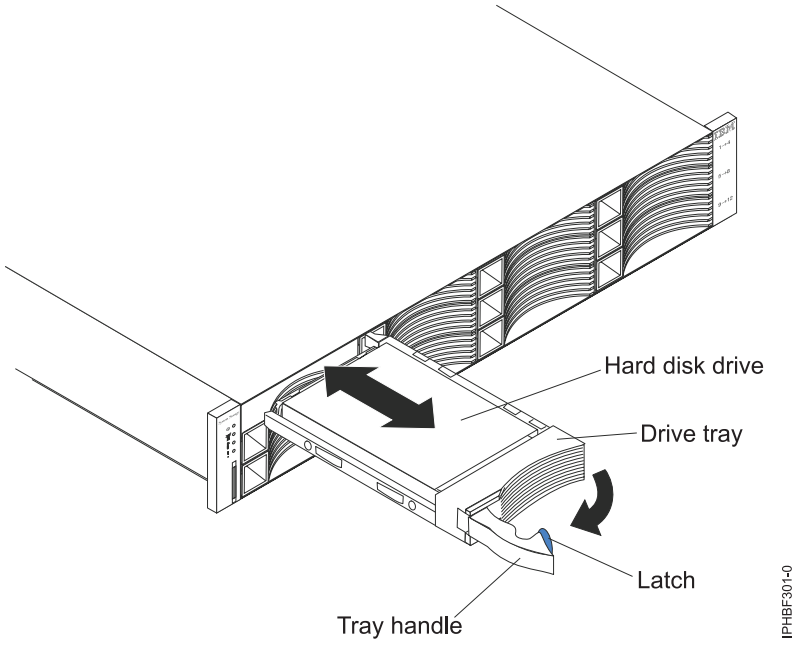


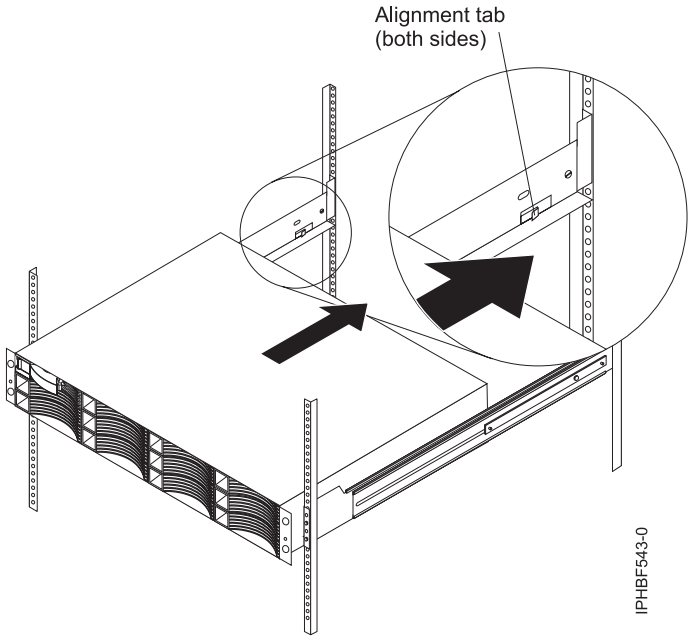
Figure 62. Removing disk drives

3. Lift the system unit and position it over the front of the rails.

   Attention:

   - For the 5802 and 5877, three people are required to safely lift the system. Using fewer than three people to lift the system can result in injury.
   - For the 5886, two people are required to safely lift the system. Using fewer than two people to lift the system can result in injury.

4. Slide the unit into the rack cabinet, making sure that it slides into the tabs on the rear of the rail.



5. Secure the front of the unit to the rack cabinet with one M5 screw in the open hole in each bracket (no washer is required).

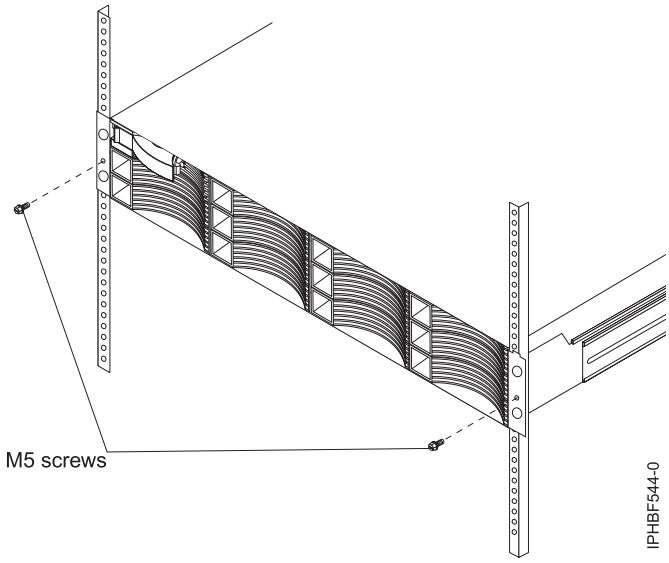
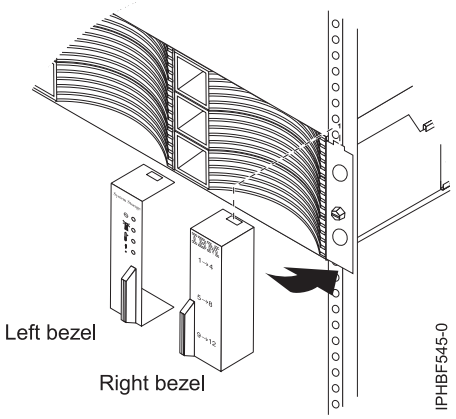


Figure 63. Installing the securing screws

6. Secure the rear of the unit to each rail assembly with one M4 pan-head screw in the slotted hole on the outside of the storage enclosure chassis wall.
7. Reverse the procedures in step 1 and step 2 to reinstall the power supplies and hard disk drives.
8. Connect a power cord to each power supply. Use the power-cord guide for strain relief to prevent the power cord from disconnecting accidentally.
9. Install the left bezel (it has the LEDs) and the right bezel. Fit the cutout on the top of the bezel over the tab on the chassis flange and then rotate the bezel down until it snaps into place. Make sure that the inside surface of the bezel is flush with the chassis.



For instructions on how to connect and configure the system when you have completed installing the system into the rack, see Enclosures and expansion units.

Installing the 5790, 5796, 7311-D11, or 7314-G30 expansion unit in a rack

You might need to install an expansion unit into the rack. Use this procedure to perform this task. In addition to information intended to promote safety and reliable operation, illustrations of the related hardware components are provided to show how these components relate to each other.

This procedure provides instructions for installing the model 5790, 5796, 7311-D11, or 7314-G30 expansion unit into an existing rack. If the rack is not installed, go to the instructions for Chapter 2, “Installing the rack,” on page 3, and then return to this procedure for instructions on installing the system unit into the rack.

Note: The shells for the 7311-D11 and 7314-G30 are different.
Attention: Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

1. Read the “Rack safety notices” on page 96.
2. Complete a parts inventory.
   - Locate the kitting report in an accessory box.
   - Ensure that you received all the parts that you ordered. There are two types of rail kits and templates for this system.
   - Two expandable rails with extension brackets

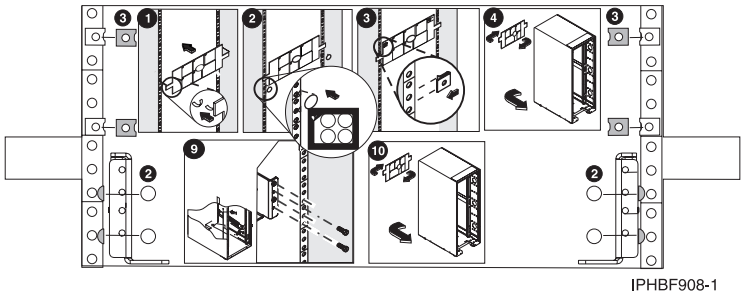


Figure 64. Rack-mounting template for the expandable rails

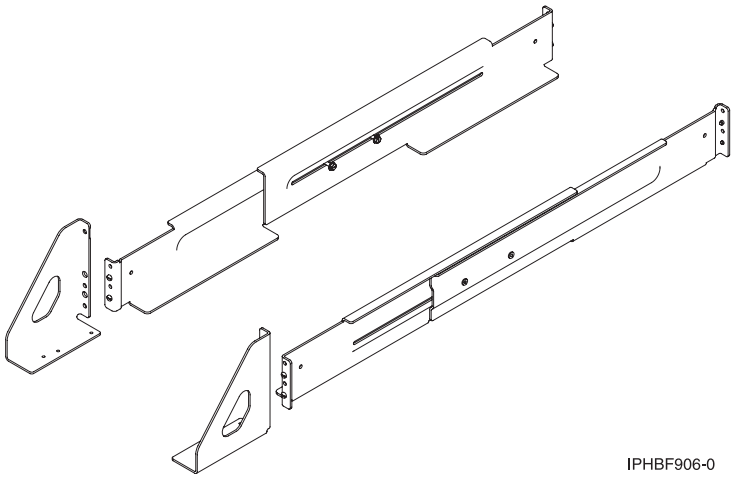


Figure 65. Expandable rails with extension brackets

Note: There are two versions of the rail kits for the 5790, 5796, 7311-D11, or 7314-G30.

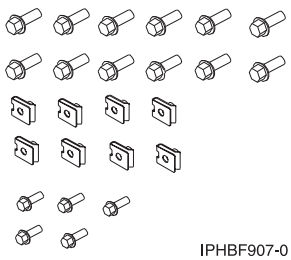


Figure 66. Rack-mounting kit

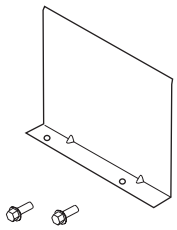


Figure 67. Filler plate and screws

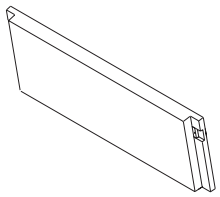


Figure 68. Front bezel

If there are incorrect, missing, or damaged parts, contact:

- Your IBM reseller
- IBM Rochester Manufacturing Automated Information Line at 1-800-300-8751 (United States only).
- Directory of worldwide contacts Web site at http://www.ibm.com/planetwide (Locate your service and support telephone numbers.)

3. Ensure that there is an empty slot in an existing shell or that there is enough room in the rack to install a new shell.

Powering off the system and removing power

You might need to power off the system and remove power. Use the procedure in this section to perform this task.

1. Ensure that the system you are attaching to is running the latest level of firmware. For information on checking or upgrading the firmware level or your system, refer to the firmware updates section of your system's installation guide.
2. After ensuring that your firmware is at the latest level, shut down and power off the system that you are attaching to. For information about shutting down and powering off the system, see the documentation provided with your expansion unit.
3. If you are installing a drawer into an existing shell, continue with "Installing the system" on page 79. Otherwise, refer to "Marking the location using the rack-mounting template" or "Marking the location without a rack-mounting template" on page 71.

Marking the location using the rack-mounting template

You may want to mark the installation location by using a rack-mounting template. This section guides you through using the rack-mounting template as a tool to perform this task.

If you do not have a rack-mounting template, go to "Marking the location without a rack-mounting template" on page 71.

Note:

1. Read the "Rack safety notices" on page 96.
2. The rack-mounting template has printed illustrations located on the front and back of the template. Each illustration is designed to aid you in identifying the EIA (Electronics Industries Association) location holes used when planning to populate your rack. *Do not* use the rack-mounting template without reading and understanding the following steps.
3. Each step must be completed in its entirety. Skipping steps or not following steps in sequence may cause rail failure, resulting in system-drawer damage or bodily injury.
4. Use the front side of the rack-mounting template when installing the hardware on the front of the rack, and the back side of the rack mounting template when installing the hardware on the back of

the rack. You can distinguish the front of the template from the back by the step numbers. The steps on the front of the rack-mounting template begin with the number 1.

To install the nut clips into the rack, using the rack-mounting template, complete the following steps:

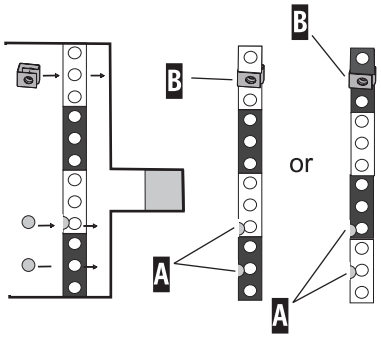
1. Locate the rack-mounting template, nut clips **(B)**, self adhesive dots **(A)**, and rails.
2. Using the rack-mounting template: Each black or white unit on the template is equal to one EIA unit. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. The EIA units illustrated on the template must be aligned with an EIA unit located on the rack. It is not necessary to align like-colored EIA units. For example, a black EIA unit illustrated on the rack-mounting template does not have to be aligned with a black EIA unit located on the rack. A black EIA unit on the rack-mounting template can be aligned with a white EIA unit located on the rack.

   To use the rack-mounting template, do the following:

   a. Determine where in the rack to place the drawer. Make note of the EIA location number. Align the black and white strip located on each side of the rack-mounting template with an EIA location on each side of the rack.
   b. Remove the protective coating from each adhesive strip located on the back tabs of the rack-mounting template. Lightly press the template into position onto the rack. Ensure that the rack-mounting template is level.

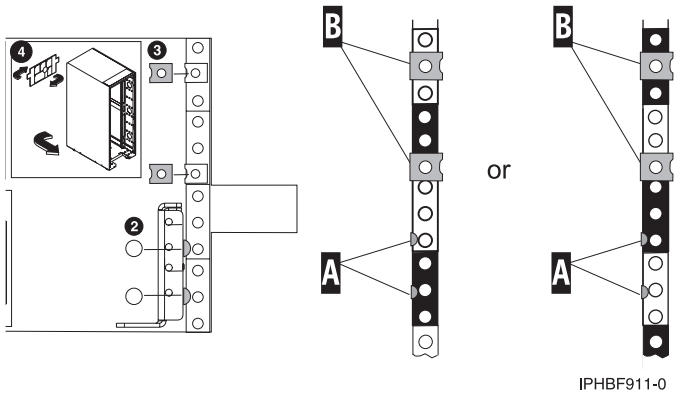
      Note: Remember the rack EIA location where you mounted the template. You will use the same EIA locations on the back of the rack.
   c. For each printed dot on the template, attach a self-adhesive dot **(A)** to the EIA strip on the rack directly across from the printed dot. These dots determine the placement of the rail-alignment pins.

      Note: When attaching the self-adhesive dots, fold the dots around the EIA rail as shown on the template and in the following illustration.



A Folded self-adhesive dot
B Nut clip

Figure 69. Attaching the dots and nut clips for the standard rails



A Folded self-adhesive dot
B Nut clip

Figure 70. Attaching the dots and nut clips for the expandable rails

d. Attach the nut clips **(B)** directly across from the template's printed nut clips onto the rack's EIA strip.
e. Remove the rack-mounting template from the front of the rack. The four self-adhesive dots and two nut clips have been placed on the front of the rack.
f. Go to the back of the rack.
g. Facing the back of the rack, remove the protective coating from each adhesive strip, and attach the backside of the rack-mounting template to the back of the rack. Place the template on the corresponding EIA locations that were noted from the front of the rack.

   Note: The steps on the back of the rack-mounting template begin with number 7.
h. Note the four dots **(A)** printed on the backside of the template. Attach a self-adhesive dot directly across from the template's printed dots onto the rack's EIA strip.

   Note: These dots indicate where the rail retaining screws will be attached.
i. Attach the nut clips **(B)** directly across from the templates printed nut clips onto the rack's EIA strip.

Marking the location without a rack-mounting template

You might need to mark the location without a template. Use the procedure in this section to perform this task.

To mark the installation location and install the nut clips into a rack without using the rack-mounting template, complete the following steps:

1. Determine where in the rack to place the drawer and make note of the location numbers.

   This drawer is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This drawer therefore is 7 in. (177.8 mm) high and covers 12 mounting holes in the rack.

   The following illustration shows a 1-EIA unit and a 4-EIA unit. Depending on the rack manufacturer, the EIA units may be separated either by color or by a line. The holes along the EIA strip are not evenly spaced. If your rack has no color or line separation between EIAs, assume that each EIA section begins where the hole spacing is closest together.

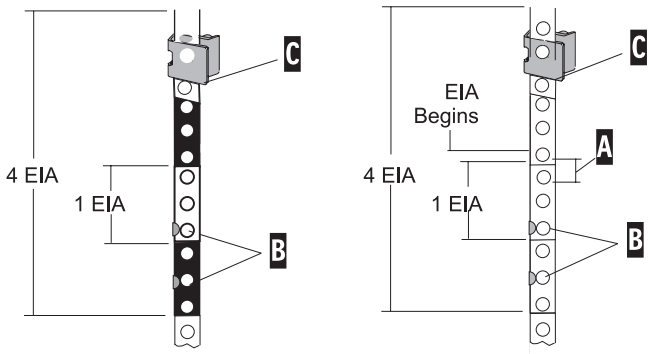


Figure 71. EIA units with the standard rails

A EIA hole spacing
B Self-adhesive dot placement
C Nut clip

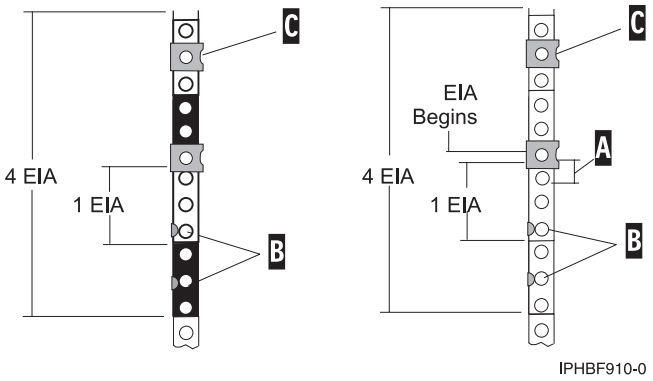


Figure 72. EIA units with the expandable rails

2. Facing the front of the rack and working from the right side, locate the bottom EIA unit that your drawer will be using and make a note of the EIA location. Place a self-adhesive dot **(B)** next to the middle hole of this EIA unit and wrap the dot around the rail, or mark the rack where it can be seen from the rear of the rack.

   Note: The self-adhesive dots **(B)** are used to identify the EIA unit holes located on the rack. Alignment pins located on the rail alignment brackets are placed through the identified holes when mounting the rails. If you no longer have any of the dots, use some other form of marking tool to aid you in identifying the hole locations. (for example, marker or pencil).
3. Begin with the hole identified by the dot, or mark, placed in substep 2; count up two holes and place the second dot, or mark the rack where it can be seen from the rear, next to the hole.
4. Begin with the hole identified in substep 3, count up seven holes and place a nut clip. The nut clip **(C)** aids in securing your drawer to the rack.
5. Repeat steps 2 through 4 on the left side of the rack.
6. Facing the back of the rack and working from the right side, locate the bottom EIA unit that your drawer will be using. Place a supplied self-adhesive dot **(B)**, or make a mark next to the middle hole of this EIA unit.
7. Begin with the hole identified by the dot, or mark, placed in substep 6, count up two holes and place the second dot, or mark, next to the hole.
8. Begin with the top dot, count up three holes and place a nut clip in that location.

9. Count up two more holes and place a second nut clip in that location.

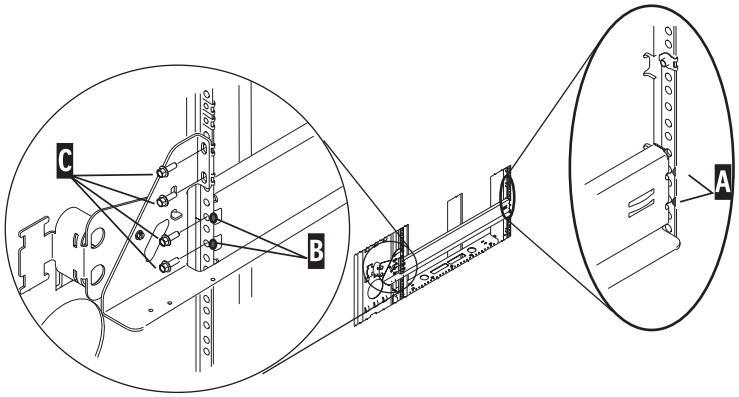
Installing the standard (fixed length) rails

You might need to install standard (fixed length) rails into the rack. Use the procedure in this section to perform this task. In addition to related safety information, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

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 used on your rack. Do not install mismatched hardware using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller. Also, to install the rails correctly, perform each task in the following order.

To install the standard (fixed length) rails, complete the steps in this section. If you have the expandable rail set, refer to "Installing the expandable rails and extension bracket into the rack."

1. From the back of the rack, note the position of the two placement dots **(B)**, or marks, previously installed on the front Electronic Industries Alliance (EIA) EIA strips. Install the rack-alignment pins for the left rail into the corresponding EIA holes located in the left front EIA strip **(A)**.
2. From the back of the rack, align the rails with the two placement dots **(B)** or marks, previously installed on the front EIA strips. Loosely thread two retaining screws **(C)** into each rail, at the corresponding EIA strip holes.



A two front placement dots per rail
B two back placement dots per rail
C four retaining screws per rail

Figure 73. Installing the rails

3. Loosely thread two retaining screws into the back EIA strips where the nut clips were previously installed.
4. Repeat steps 1 through 3 for the right rail.
5. Tighten all screws.

Installing the expandable rails and extension bracket into the rack

You might need to install rails into the rack. Use the procedure in this section to perform this task. In addition to related safety information, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

Attention: Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

To install the expandable rails into the rack, complete the following steps:

1. Loosen the two screws **(B)** in the middle of both rails **(A)** to allow each rail to extend.

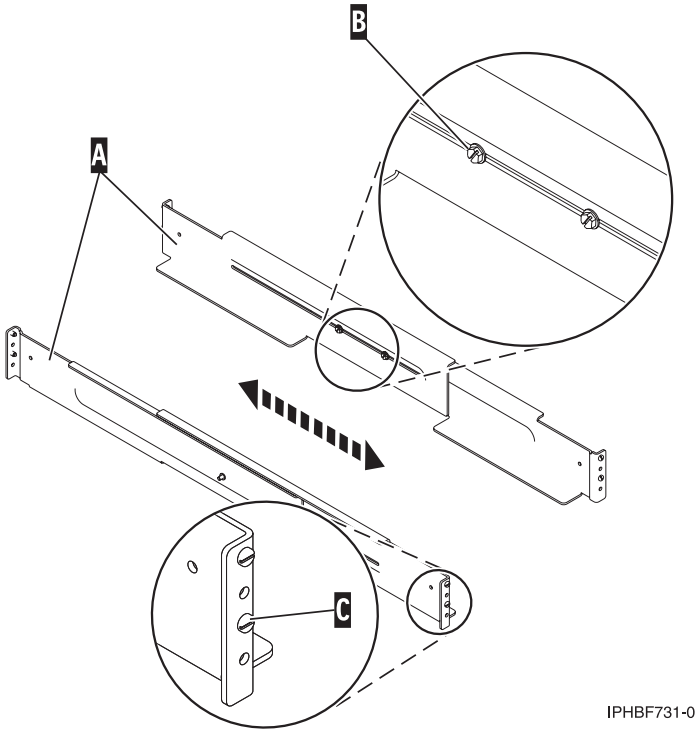


Figure 74. Extending the system rails

2. Starting at the back of the rack, extend the left rail and insert the rail pins **(C)** into the marked locations the rack so that it is facing upward (L shape).

   Tip: Although the rail installation can be completed by one person, for ease of installation, one person can be positioned at the front of the rack and one person at the back of the rack.
3. From the back of the rack, extend the right rail and insert the rail pins **(C)** into the marked locations.
4. Move to the front of the rack, extend the left rail and insert the rail pins **(C)** into the marked locations.
5. Extend the right rail and insert the rail pins **(C)** into the marked locations.
6. Using one M5 screw **(D)**, secure the left rail to the front of rack into the lower location **(E)**.

   Important: Do not install a screw in the top location at this time. It will secure the shell to the assembly.

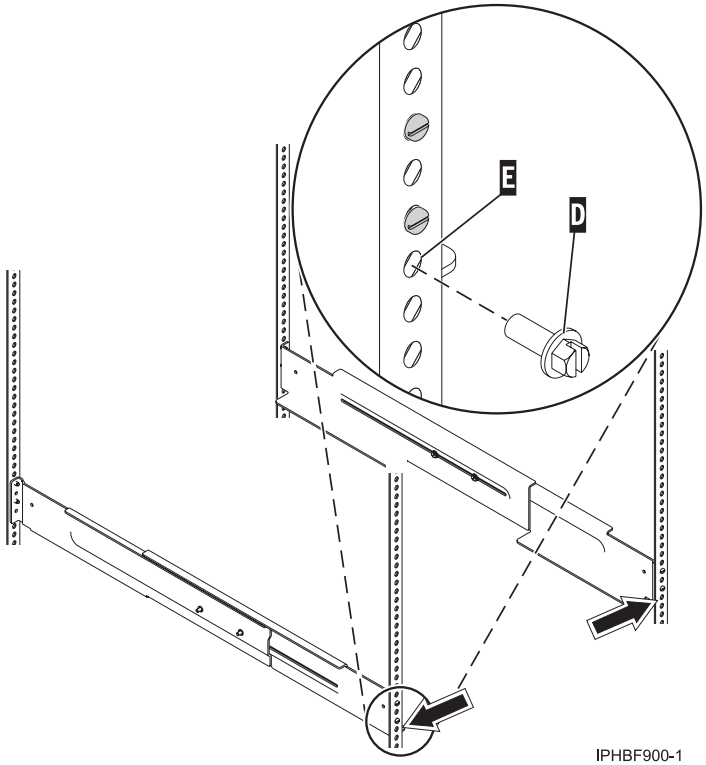


Figure 75. Attaching the system rails to the front of the rack

7. Using one M5 screw **(D)**, secure the right rail to the front of the rack into the lower location **(E)**.
8. Insert two nut clips at the marked location on the front-left rail of the rack.
9. Insert two nut clips at the marked locations on the front-right rail of the rack.
10. Move to the back of the rack and insert two nut clips at the marked locations on the back-left rail of the rack.
11. Insert two nut clips at the marked location on the back-right rail of the rack.
12. If you are installing a 5790 expansion unit, secure the extension bracket **(F)** through the rack and into the left rail using three M5 screws **(G)**.

    Note: Each bracket will face inward.

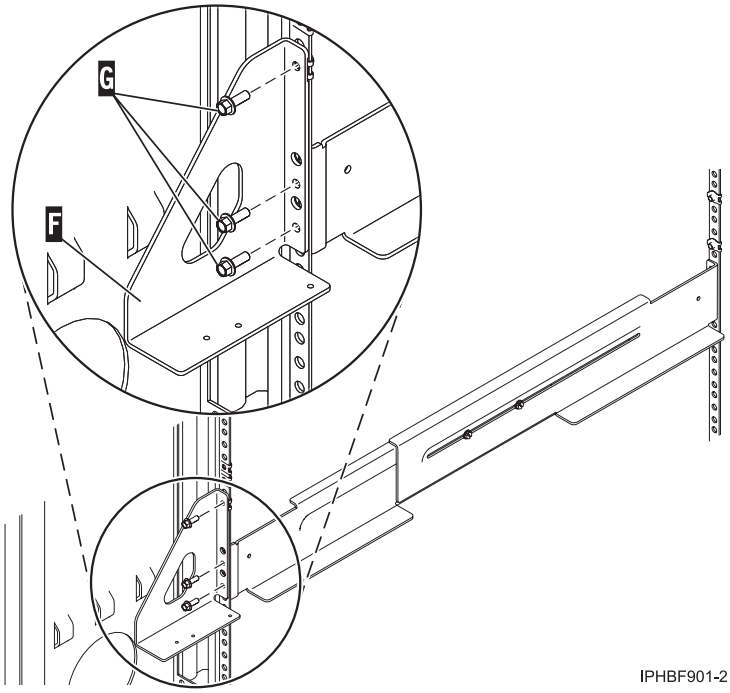


Figure 76. Attaching the extension brackets and rails to the back of the rack

13. If you are installing a 5790 expansion unit, secure the extension bracket **(F)** through the rack and into the right rail using three M5 screws **(G)**.
14. Tighten the two screws in the middle of the left rail and the two screws in the middle of the right rail. Refer to Figure 75 on page 75.

Installing the shell

You might need to install the shell. Use the procedure in this section to perform this task. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

Notes:

- The shells for the 7311-D11 and 7314-G30 are different.
- Before installing the shell, ensure that the rails are level from side to side and from front to back.

To install the shell, complete the following steps:

1. From the front of the rack, place the shell **(A)** on the rails and slide it into the rack.

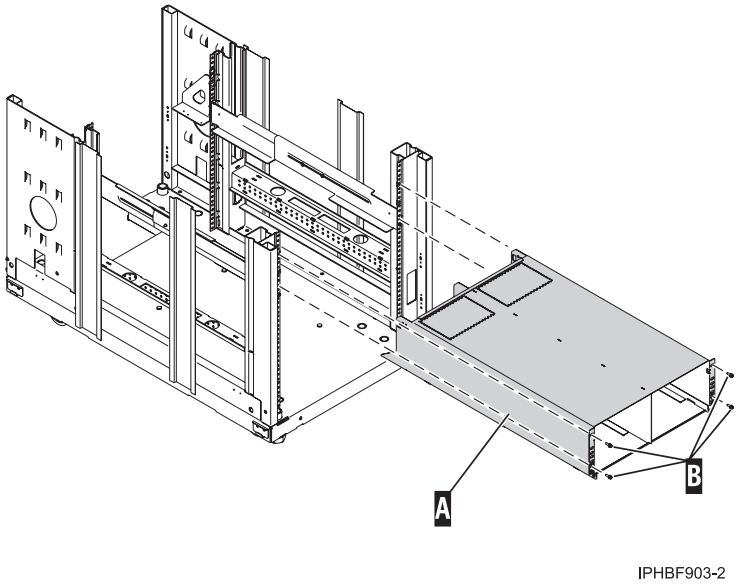


Figure 77. Installing the shell into the rack on the expandable rails

A Shell
B Retaining screws (four)

2. Install and tighten the four retaining screws **(B)** into the front of the shell, securing the shell **(A)** to the rack.
3. If you are only installing one drawer, move to the back of the rack and secure the shell **(A)** with the retaining screw **(C)**. Ensure screw **(C)** is attached to the slot of the shell opposite of the slot in which you intend to place the system drawer.

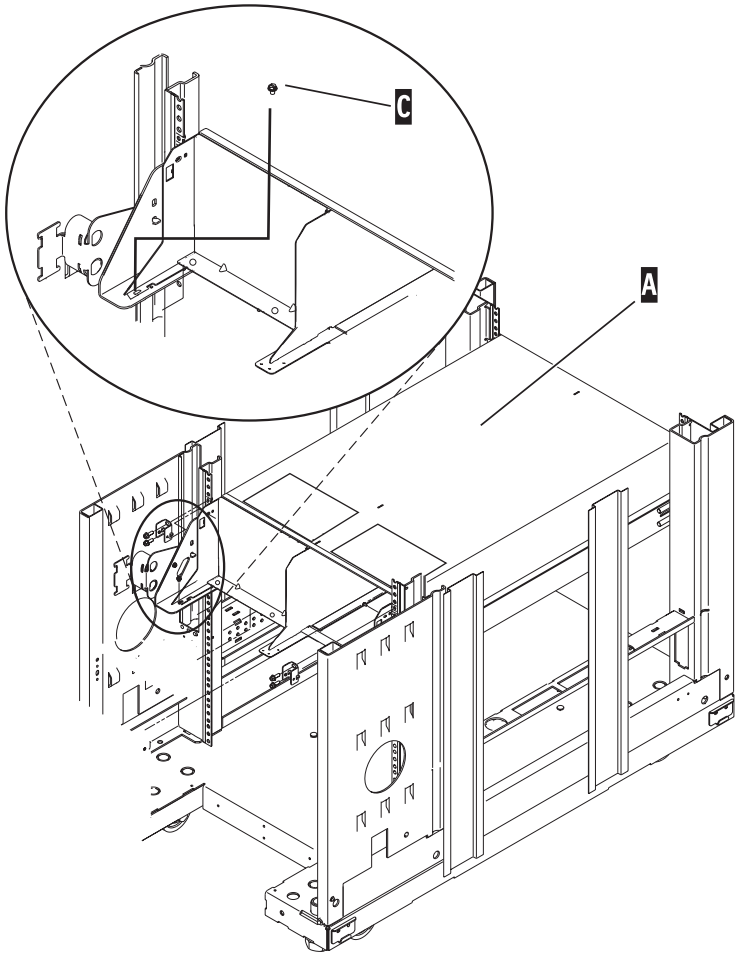


Figure 78. Securing the shell to the rack with the standard rails

A Shell
C Retaining screw

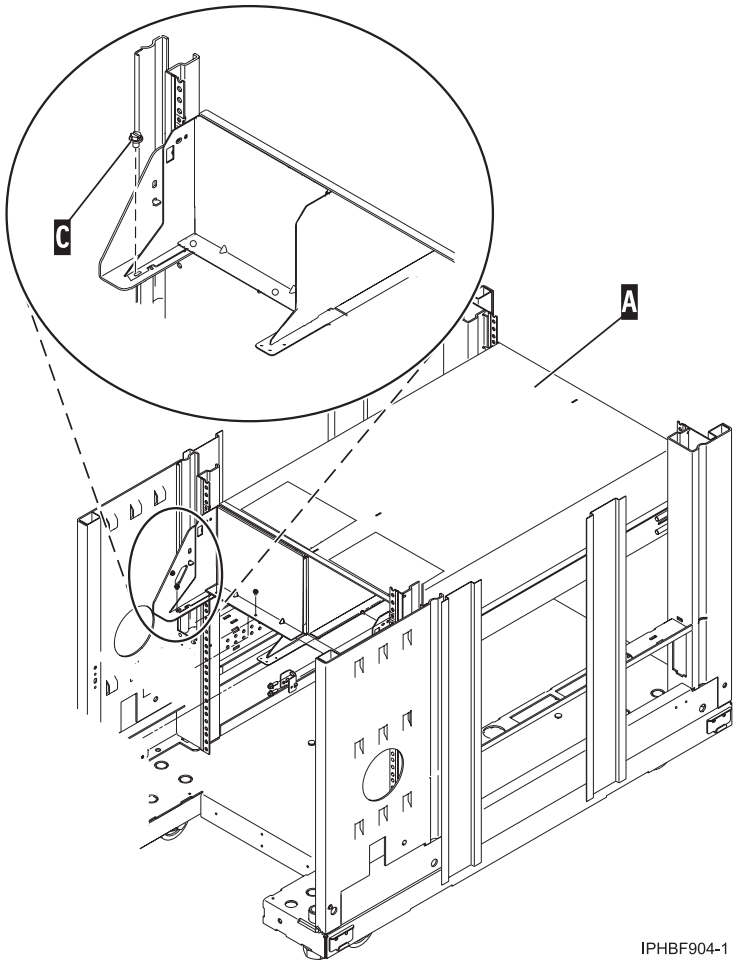


Figure 79. Securing the shell to the rack with the expandable rails

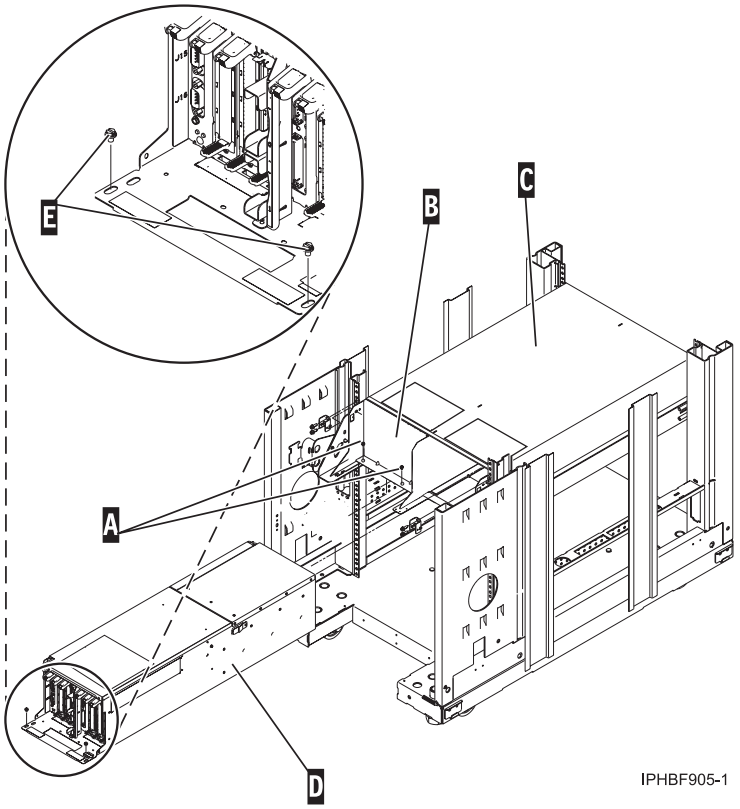
A Shell
C Retaining screw

Installing the system

You might need to install the system into the rack. Use the procedure in this section to perform this task. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

To install the system into a rack, complete the following steps:

1. If you are installing a 5790 or 7311-D11 expansion unit into the rack, move to the back of the rack. If you are installing a 5796 or 7314-G30 expansion unit into the rack, remain at the front of the rack.
2. If you are installing a drawer **(D)** into an existing shell **(C)**, remove the two filler plate screws **(A)** and the filler plate **(B)**.



A Filler plate screws
B Filler plate
C Shell
D Drawer
E Drawer screws

Figure 80. Removing the filler plate

3. Carefully move any existing cables that are blocking the drawer location.
4. Slide the drawer **(D)** into the shell.
5. Install and tighten the two drawer screws **(E)**, securing the drawer to the shell.
6. If you are installing two drawers, repeat substeps 1 through 5. If there is only one drawer installed in the shell, ensure that the filler plate **(B)** is installed in the blank slot.

Attaching the RIO/HSL, power controller (SPCN), and power cables

You might need to attach the Remote I/O (RIO)/High Speed Link (HSL), System Power Control Network (SPCN), and power cables to the system. Use the procedure in this section to perform this task.

For instructions on cabling and connecting your expansion units, see Enclosures and expansion units.

Powering on the system

You might need to power on the system. For information about powering on the system, refer to Start the system or logical partition.

Installing the model 5786, or 7031-D24 into a rack

You might need to install the expansion unit into a rack. This section includes procedures so that you can perform these tasks.

This procedure assumes that you are installing the expansion unit into an existing rack.If the rack is not installed, follow the instructions in Chapter 2, “Installing the rack,” on page 3, and then return to this procedure for instructions on installing the expansion unit into the rack.

When you have installed the expansion unit into the rack, you will need the instructions in Disk drives, to connect and configure the 7031-D24 or 5786.

Note: This procedure applies only to the models that are designed to be mounted into a rack.

To install the expansion unit into a rack, perform the following steps:

Attention: Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in order. Failure to do so might cause rail failure and potential danger to yourself and the expansion unit.

1. Read the “Rack safety notices” on page 96. Failure to read these notices could cause damage to the equipment or injury to the installer.
2. Complete a parts inventory (See “Completing a parts inventory” on page 82).
3. Locate the rack-mounting template **(A)**, the rack-mounting hardware kit **(B)**, and the system rail assemblies **(C)** that were included with your expansion unit. See Figure 81 on page 82 for the relative locations of these items. The system rails are identical.

   Note: An 8-mm nut driver and a flat-blade screwdriver, represented in the following diagram, are not listed in the inventory or included in the parts shipped, but these tools will assist you in completing the installation.

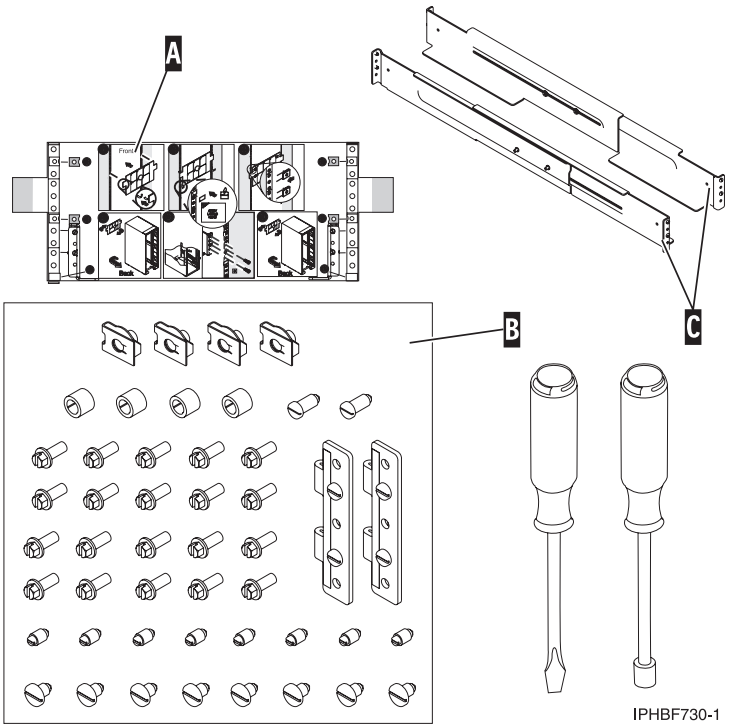


Figure 81. Parts inventory

4. Determine where you will locate the expansion unit in the rack. See "Determining the location." This expansion unit is 4 Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height.
5. Mark the location. See "Marking the location using rack-mounting template" on page 84. If you do not have the rack-mounting template, see "Marking the location without a rack-mounting template" on page 84.

Completing a parts inventory

You might need to complete a parts inventory. Use the procedure in this section to perform this task.

If you have not done so, complete a parts inventory before proceeding with the installation:

1. Locate the kitting report in an accessory box.
2. Ensure that you received all the parts that were ordered.

If there are incorrect, missing or damaged parts, contact:

- Your IBM reseller
- IBM Rochester Manufacturing Automated Information Line at 1-800-300-8751 (United States only)
- Directory of worldwide contacts Web site at http://www.ibm.com/planetwide (Locate your service and support telephone numbers.)

Determining the location

You might need to determine where to install an expansion unit in the rack. Use these procedures to perform these tasks either with or without the aid of a rack-mounting template

Before installing the expansion unit into a rack, complete the following steps:

1. Read the "Rack safety notices" on page 96.

2. Plan where you will place the units. Place the larger and heavier units in the lower part of the rack. These expansion units are four Electronic Industries Alliance (EIA) units high. The rack contains three mounting holes for each EIA unit of height. Each of these units therefore is 7 in. (177.8 mm) high and covers 12 mounting holes in the rack.
3. Remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit.

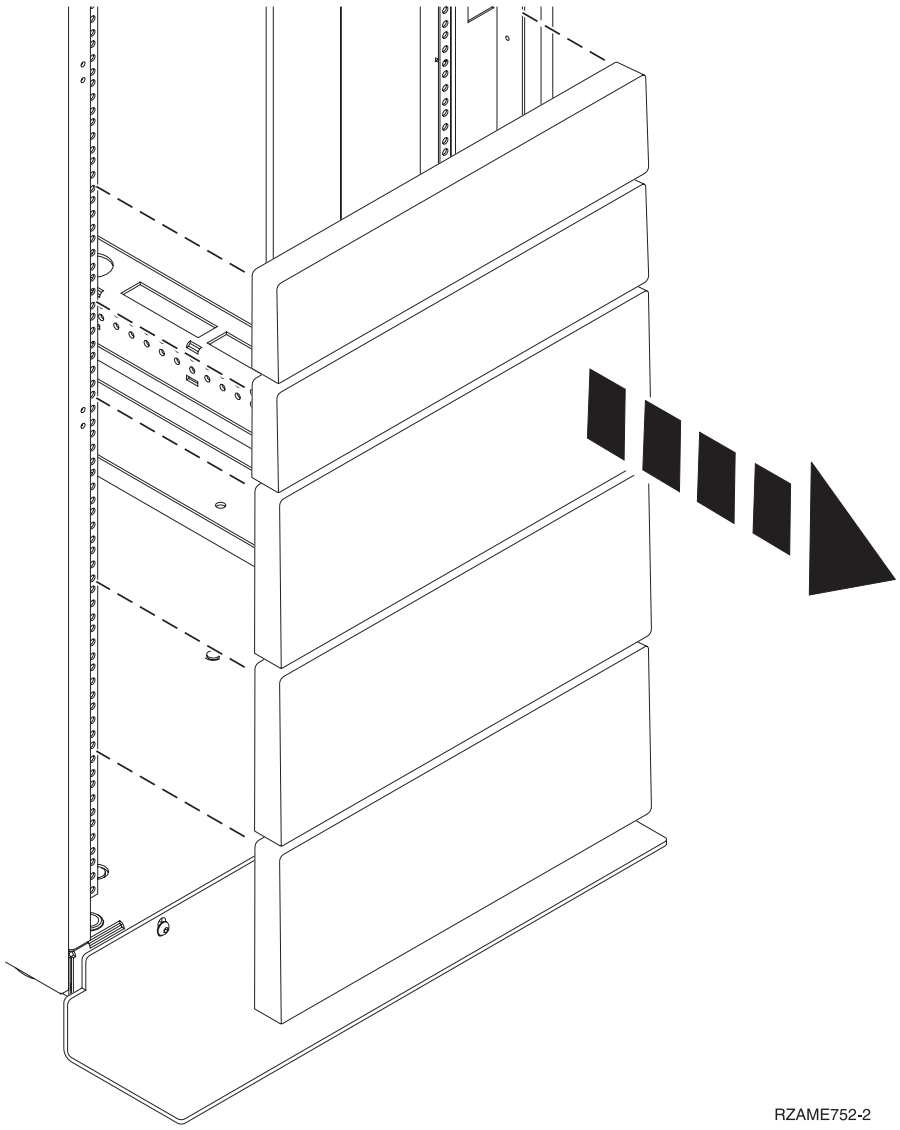


Figure 82. Removing the filler panels

4. Remove the front and back rack doors if necessary.
5. Use one of these procedures to mark the location:
   a. If you have a rack-mounting template see "Marking the location using rack-mounting template" on page 84.
   b. If you do not have a rack-mounting template, follow the instructions for marking the location without a template see "Marking the location without a rack-mounting template" on page 84.

Marking the location without a rack-mounting template

You might need to mark the location without a template. Use the procedure in this section to perform this task.

To mark the installation location and install the nut clips into a rack without using the rack-mounting template, complete these steps:

1. Determine where in the rack to place the unit and make note of the location numbers. This unit is four Electronic Industries Alliance (EIA) units high. An EIA unit is 1.75 in. (44.45 mm) in height. The rack contains three mounting holes for each EIA unit of height. This unit therefore is 7 in. (177.8 mm) high and covers 12 mounting holes in the rack.
2. Facing the front of the rack and working from the left side, locate the lowest EIA unit that your unit will use and make a note of the EIA location. Place a supplied self-adhesive dot next to the top mounting hole **(B)** of this EIA unit and wrap the dot around the rail, or mark the rack so that the mark can be seen from the rear of the rack.

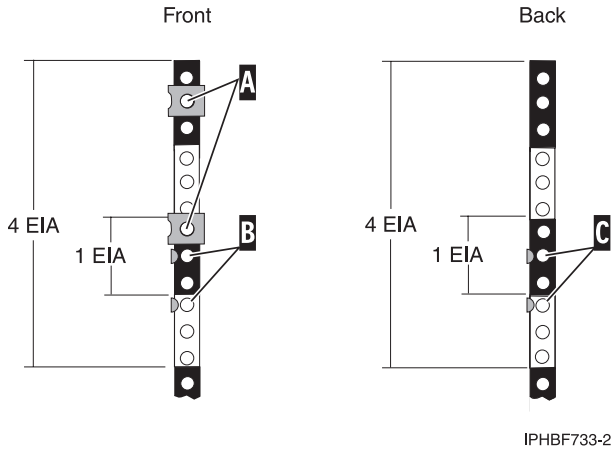


Figure 83. Marking the installation locations

Note: The self-adhesive dots are used to aid in identifying locations on the rack. If do not have any of the dots, use some other form of marking tool to aid you in identifying hole locations (for example, tape, a marker, or pencil).

3. On the left rail, count up two mounting holes from where you placed the dot or mark in step 2 and place another self-adhesive dot or mark next to that mounting hole **(B)**. Wrap the dot around the rail or mark the rack so that the mark can be seen from the rear of the rack. You now have two dots or marks on the rack, with one mounting hole between the dots.
4. Repeat steps 2 and 3 to place two adhesive dots or marks on the corresponding mounting holes on the front-right rail.
5. Go to the back of the rack. On the left side, find the EIA unit that corresponds to the lowest EIA unit marked on the front of the rack.
6. Place a self-adhesive dot at the top hole **(C)** of the lowest EIA unit. Wrap the dot around the rail or mark the rack so that the mark can be seen from the rear of the rack.
7. Count up two mounting holes from where you placed the dot or mark in step 6 and place another self-adhesive dot or mark next to that mounting hole **(C)**.
8. Repeat steps 6 and 7 to place two adhesive dots or marks on the corresponding mounting holes on the rear-right rail.

Marking the location using rack-mounting template

You may want to mark the installation location by using a rack-mounting template. This section guides you through using the rack-mounting template as a tool to perform this task.

1. Using the rack-mounting template, determine where in the rack to place the system unit. Install units in the lower part of the rack first. Place larger and heavier units in the lower part of the rack.

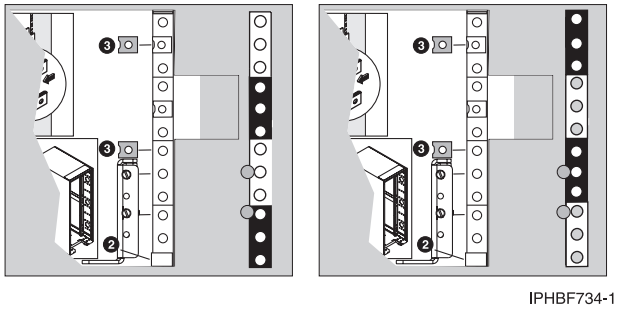


Figure 84. Example of a rack-mounting template

Note: The front of the rack-mounting template has printed illustrations designed to help you identify the EIA location holes to be used when you add units to the rack. Do not use the rack-mounting template without completing the following steps.

2. Note the following when using the rack-mounting template:
   - Each black or white unit on the template is equal to one Electronic Industries Alliance (EIA) unit.
   - An EIA unit is 1.75 in. (44.45 mm) in height.
   - The rack contains three mounting holes for each EIA unit of height.
   - The EIA units illustrated on the template must be aligned with the EIA units located on the rack.
   - It is not necessary to align like-colored EIA units. For example, a black EIA unit on the rack-mounting template can be aligned with a white EIA unit located on the rack.
   - The template is two-sided. When using the template, ensure that the appropriate side of the template is facing out.

   Figure 85 shows one EIA unit and four EIA units. Depending on the rack manufacturer, the EIA units might be separated either by color or by a line. Notice that the holes along the rail are not evenly spaced. If your rack has no color or line separation between EIA units, assume that each EIA unit begins where the hole spacing **(A)** is closest together.

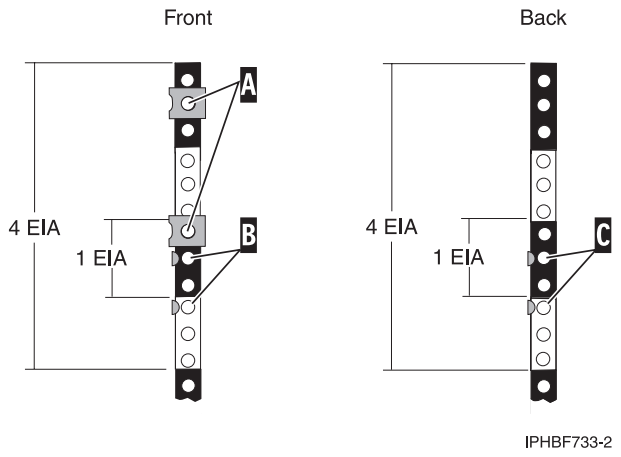


Figure 85. EIA units example

To use the rack-mounting template, follow these steps:

a. Remove the protective coating from each adhesive strip located on the back of the rack-mounting template. Lightly press the template into position on the rack. Ensure that both the left and right sides are at the corresponding EIA locations.

Note: The tabs on each side of the template show a notch to indicate the proper spacing between the front flanges.

b. Locate the dots, printed on the left and right side of the template. Place a self-adhesive dot directly across from the template's printed dots on or near the rack's EIA numbering strip. You will be using these dots to aid in correctly positioning the rail-alignment pins located on the front of each rail.

c. Remove the rack-mounting template from the front of the rack. The front of your rack should now contain dots.

d. Mount the rack-mounting template to the rack's back EIA frame. Place the rack-mounting template at the same EIA-numbered location that was used on the front of the rack.

e. Wrap a self-adhesive dot directly across from the template's printed dots. Ensure that a portion of the self-adhesive dot wraps around the rack frame so that it can be seen from the front of the rack.

f. Remove the rack-mounting template from the back of the rack. The back of your rack should now contain dots that have been partially wrapped around the frame.

Attaching the mounting hardware to the rack

You might need to attach mounting hardware to the rack. Use the procedure in this section to perform this task. In addition to information intended to promote safety and reliable operation, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

CAUTION:
Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.

To install the mounting hardware into the rack, follow these steps:

1. Loosen the two screws **(B)** in the middle of both rails **(A)** to allow each rail to extend.

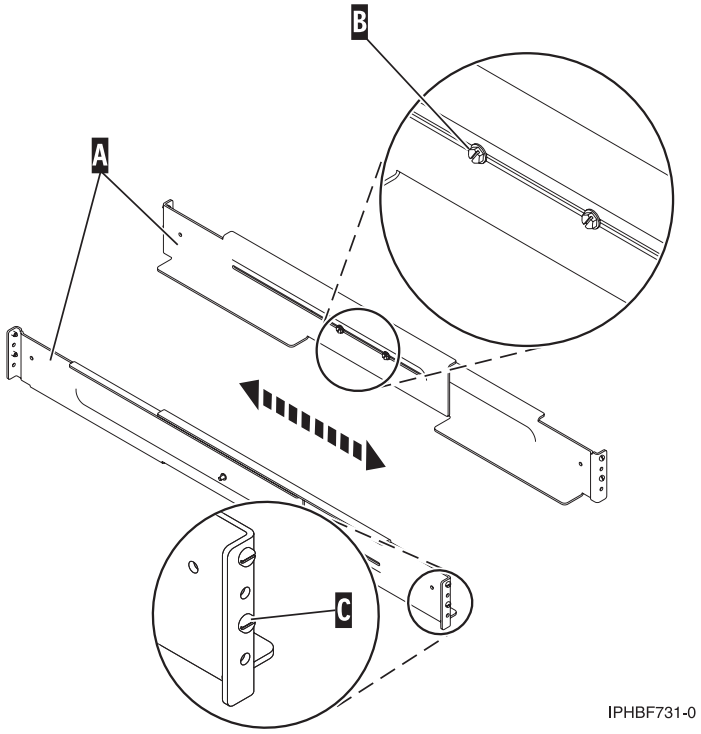


Figure 86. Extending the system rails

2. Starting at the back of the rack, extend the left rail and insert the rail pins **(C)** into the marked locations the rack so that the rail is facing upward.

   Note: Although the rail installation can be completed by one person, the installation will be easier if one person is positioned at the front of the rack and one person is positioned at the back of the rack.
3. From the back of the rack, extend the right rail and insert the rail pins **(C)** into the marked locations.
4. Moving to the front of the rack, extend the left rail and insert the rail pins **(C)** into the marked locations.
5. Extend the right rail and insert the rail pins **(C)** into the marked locations.
6. Using two M5 screws **(D)**, secure the left rail to the front of rack below each rail pin **(C)**.

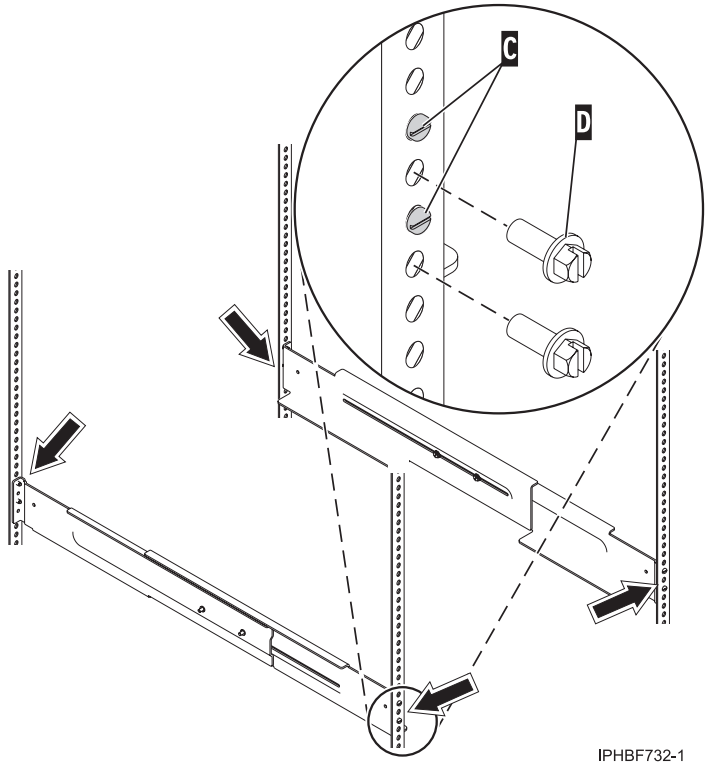


Figure 87. Attaching the system rails

7. Using two M5 screws **(D)**, secure the right rail to the front of the rack.
8. Moving to the back of the rack and using two M5 screws **(D)**, secure the left rail to the back of the rack.
9. Using two M5 screws **(D)**, secure the right rail to the back of the rack.
10. Tighten the two screws in the middle of the left rail and the two screws in the middle of the right rail. Refer to Figure 87.
11. Insert two nut clips at the marked location on the front-left rail.
12. Insert two nut clips at the marked locations on the front-right rail.

Installing the 5786, or 7031-D24 on the rail assembly

You might need to install the system on the rail assembly. Use the procedure in this section to perform this task. In addition to related safety information, this section also includes illustrations of the related hardware components and shows how these components relate to each other.

Before installing the system on the rail assembly, ensure that the stabilizers are extended and the tip plate is attached to the bottom front of the rack to prevent the rack from falling forward when the rails are pulled out of the rack. Refer to “Rack safety notices” on page 96.

To install the system unit on the rail assembly, follow these steps:

1. If the bezel is installed on the front of the system, remove it by pressing in on the two release buttons.

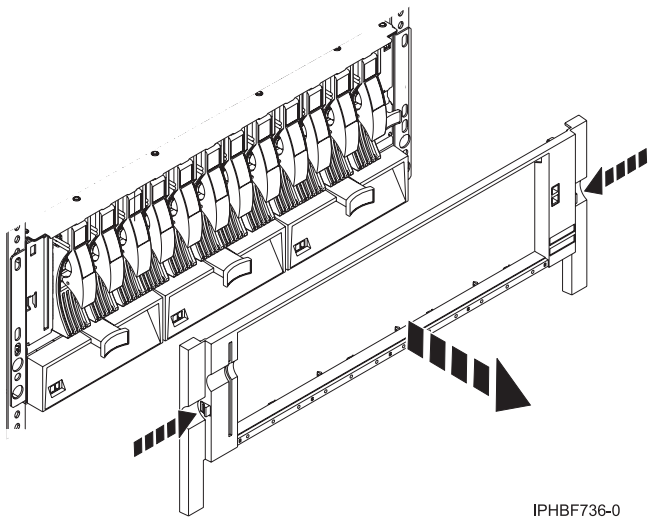


Figure 88. Removing the bezel

2. Using three people, lift the system unit and position it over the front of the rails.

   Attention: Three people are required to safely lift the system. Using fewer than three people to lift the system can result in injury.
3. Push the system into the rack until it is completely installed into the rack.
4. If the securing plates are not preinstalled on the back of the system, attach the plates to the back left and back right of the system. The securing plates are illustrated in Figure 90 on page 90.
5. Install the two M5 securing screws **A** through the chassis and into the nut clips **(B)** on the left and right rail.

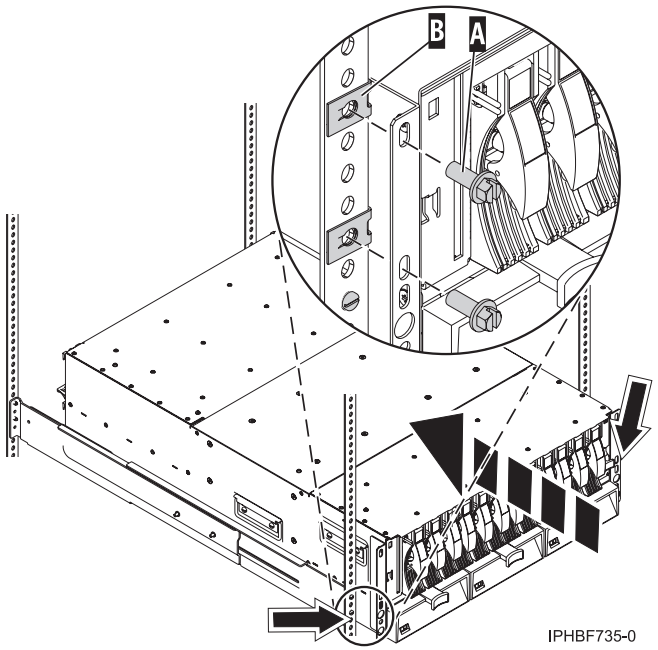


Figure 89. Installing the securing screws.

6. At the back of the rack, install two M5 securing screws **(C)** through the back of both the left and right securing plates and into the rack rail.

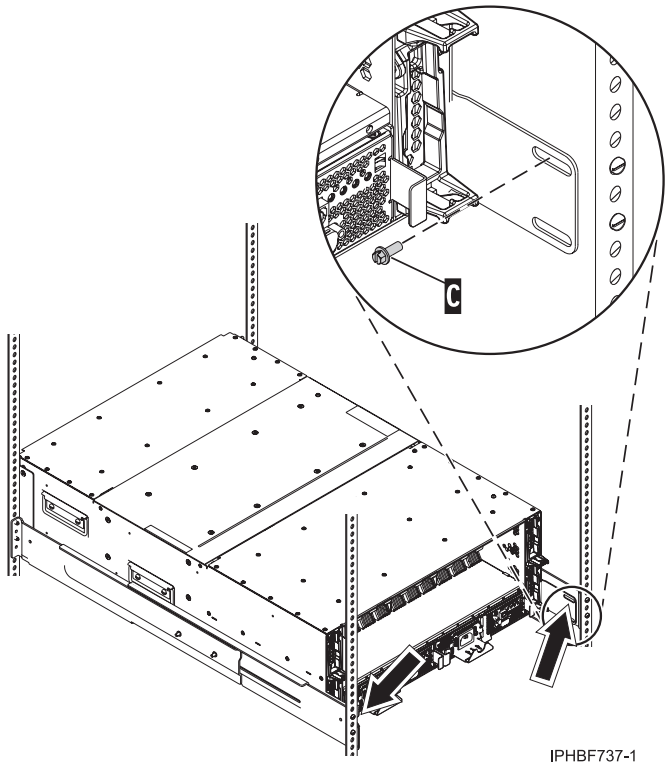


Figure 90. Securing the system to the back of the rack

7. Install the bezel onto the system.

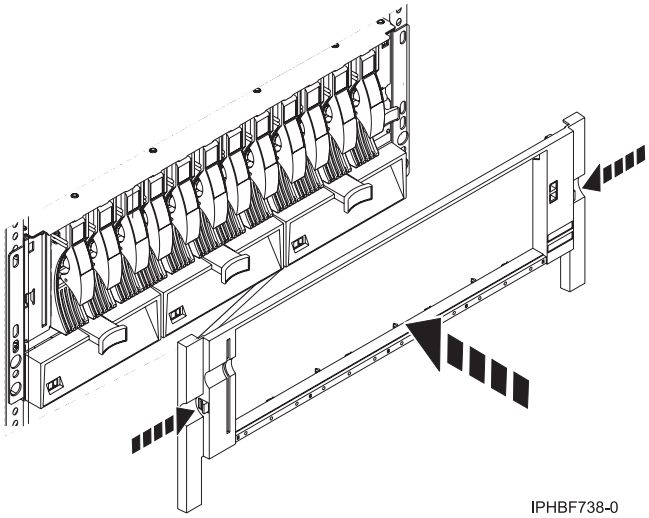


Figure 91. Installing the bezel

For instructions on how to connect and configure the system when you have completed installing the 5786 or 7031-D24 into the rack, see Enclosures and expansion units.

Attaching the cable-management arm to the standard rails

You might need to attach the cable-management arm. Use the procedure in this section to perform this task.

If standard (fixed length) rails were included with the system, and the cable-management arm is not attached to the rails, complete the following steps. Otherwise, go to “Determining the location” on page 50.

1. Insert the cable-management arm rail tab **(B)** into the rail.
2. Rotate the cable-management arm **(A)** as shown in the following illustration.

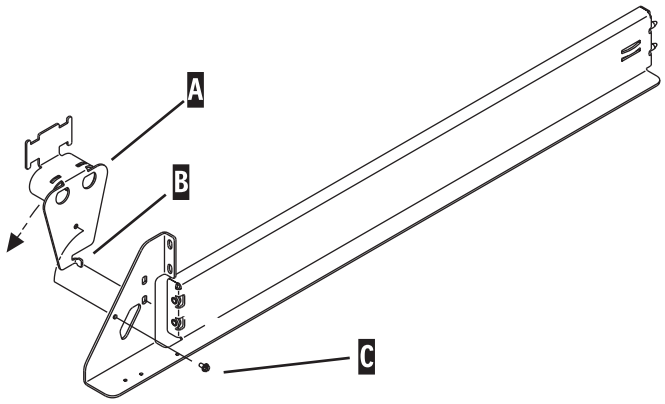


Figure 92. Rotating the cable-management arm

3. Secure the cable-management arm **(A)** with the retaining screw **(C)**.
4. Repeat steps 1 through 3 for the other rail.

Chapter 4. Removing and replacing 0551, 0553, 7014-T00, or 7014-T42 side panels

You might need to remove and replace a side panel on a rack. Use the procedure in this section to perform this task.

The rack might have optional side panels. To remove and replace a side panel, complete the following procedure:

1. Unlock the side panels by pressing down on both locking latches to release the latches.

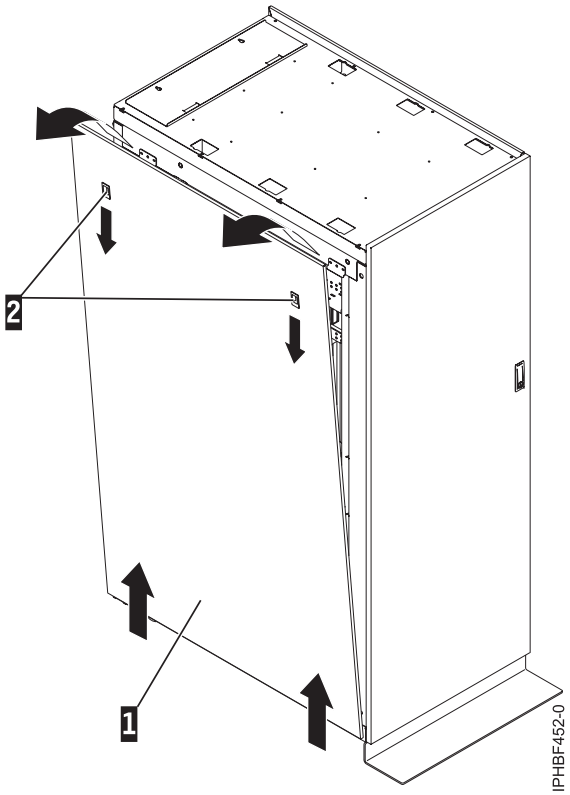


Figure 93. Removing the side panel

   Note: If your rack uses a ruggedized kit, you must remove the securing screw to allow each side panel to be removed. Refer to "Releasing the side panel with a ruggedized kit" on page 104.
2. Tilt the top of the side panel slightly toward you.
3. Lift the side panel away from the ridge on the bottom of the rack.
4. Repeat this procedure for the other side panel.

Replacing a 0551, 0553, 7014-T00, or 7014-T42 side panel

You might need to replace a side panel on a rack. Use the procedure in this section to perform this task.

To replace a side panel, complete the following procedure:

1. Tilt the top of the side panel slightly toward you.

2. Place the bottom of the side panel onto the ridge on the bottom of the rack.

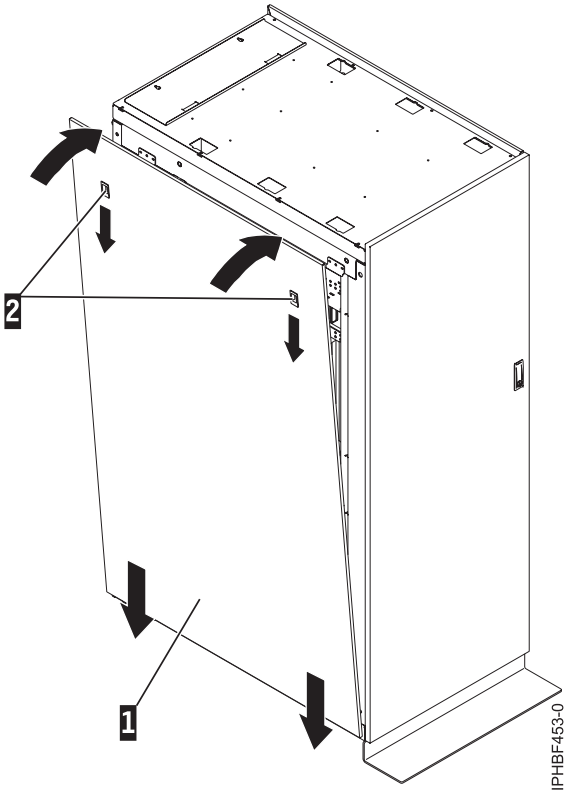


Figure 94. Replacing the side panel

3. Slide the top of the side panel into place and close the locking latches.

   Note: If your rack uses ruggedized kit, you must install a securing screw into each side panel that was installed. Refer to Chapter 7, “Ruggedized kit,” on page 103.

Chapter 5. Attaching the rack doors

You might need to attach the rack doors. Use this procedure to perform this task.

Depending on the model of the rack, the front door of a rack might be an optional feature. If your system already has the front door installed, or does not have a front door to install, skip this step.

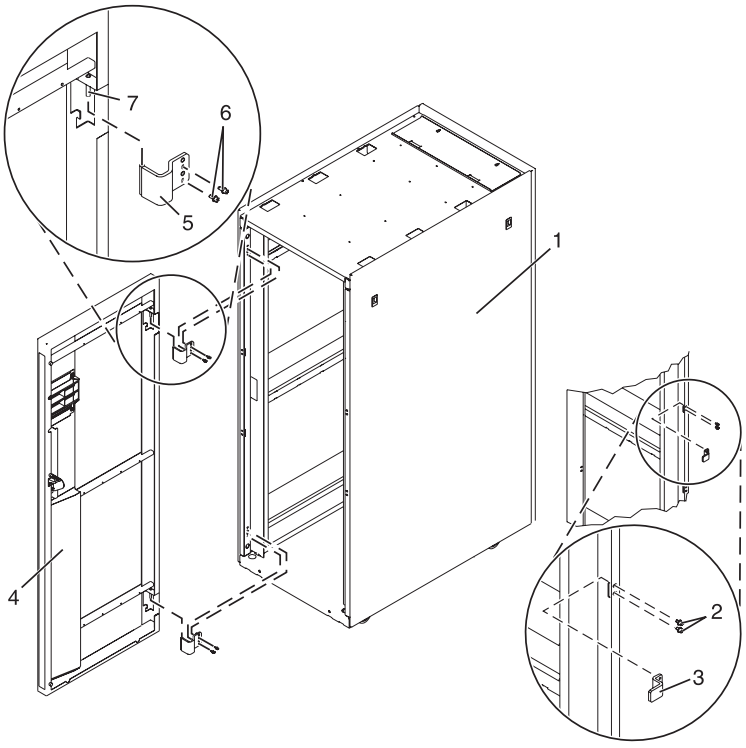


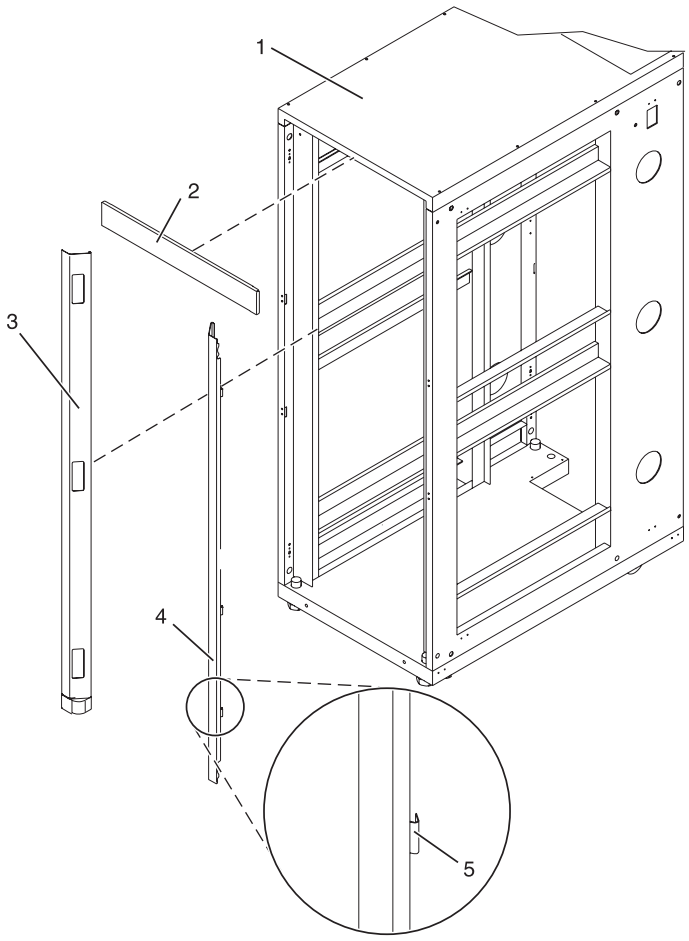
Figure 95. Attaching the rack door

Attaching a high-perforation front door

You might need to attach a front door to the rack. Use the procedure in this section to perform this task.

To install the high-perforation front door, do the following:

1. Read the "Rack safety notices" on page 96.
2. Remove the top, left, and right trim panels.



1 Rack chassis
2 Top trim panel
3 Left side trim panel
4 Right side trim panel
5 Spring clip

Figure 96. Removing the trim panels

3. Install the door latch on the right and the door hinges on the left.
4. For a high-perforation front door, align the door over the rack hinge, then move up the hinge pin on the door, and lower the hinge pin into the hinge.
5. Adjust the latch so the door latches securely.

Rack safety notices

You need to read the rack safety notices before installing equipment.

Before installing a rack, rack features, or a system or expansion unit into a rack, read the following safety information.

Attention: If you are installing equipment into a non-IBM rack, the rack must comply with the Electronics Industries Association (EIA) 310D specifications. If you do not have a rail kit designed for the equipment in the non-IBM rack, do not install the equipment into the rack as damage to the equipment or personal injury could occur.

DANGER

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

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

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

CAUTION

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

(R001)

Lift precautions:

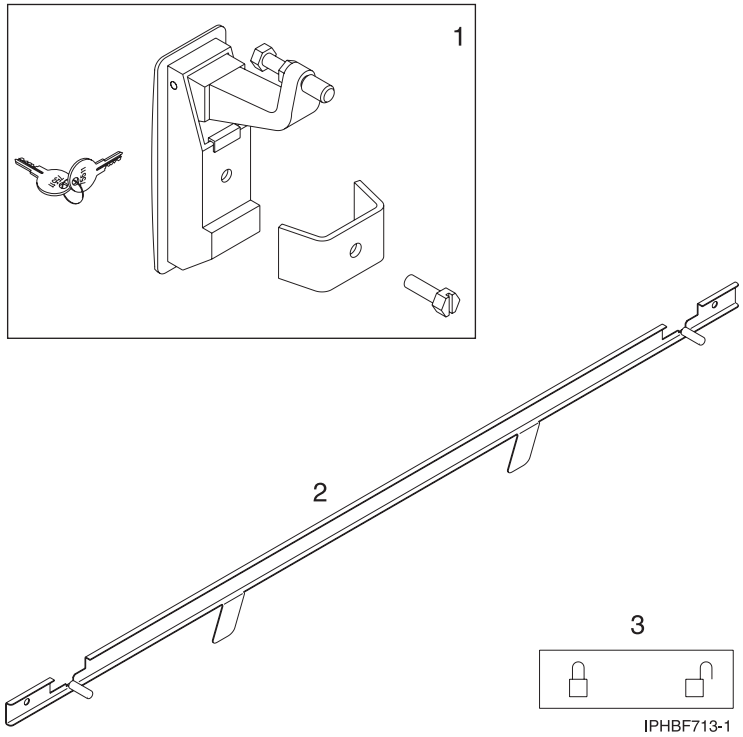

18-32 kg (39.7-70.5 lbs)
32-55 kg (70.5-121.2 lbs)
≥55 kg (≥121.2 lbs)
IPHBF443-0

Chapter 6. Installing the rack security kit

You might need to install the rack security kit. Use the procedure in this section to perform this task. This section also includes illustrations of the related hardware components and shows how these components relate to each other.

To install a rack security kit (feature 6580) that consists of the security lock and security slide bars, complete the following procedure:

1. Read the "Rack safety notices" on page 96.
2. Verify the inventory in the rack security kit.



•

1 Two lock hardware kits. Each kit contains:

- Rack lock
- Bracket
- Screw
- Two keys

2 Two security slide bars
3 Two locked/unlocked stickers

Figure 97. Rack security kit inventory

3. Remove the existing door latch.

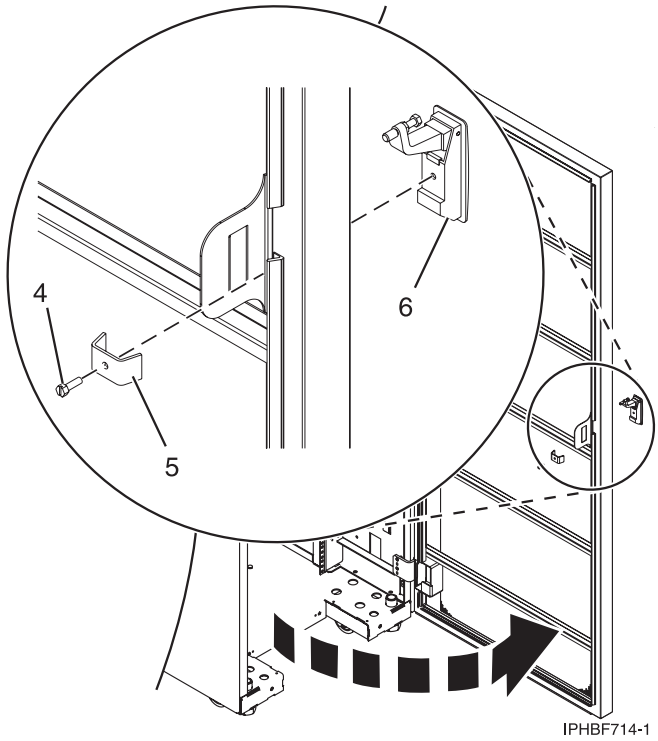


Figure 98. Removing the existing door latch

a. Open the front rack door.
b. On the inside of the door, remove the screw **(4)** in Figure 98, that secures the lock to the rack door.
c. Remove the bracket **(5)**.
d. From the outside of the door, remove the door latch **(6)**.

Note: If the rack is equipped with the ruggedized kit, remove the jam nut and hex nut from the existing door latch and reinstall both nuts on the new door lock latch.

4. Install the locking latch.
   a. Insert the keyed rack lock into the latch slot on the front of the door **(6)** in Figure 98.
   b. Secure the lock by attaching the lock bracket **(5)** with the screw **(4)**, on the inside of the door.
5. Repeat steps 3 on page 99 and 4 to install the second lock on the back rack door.
6. Install a security slide bar on the right side of the rack.

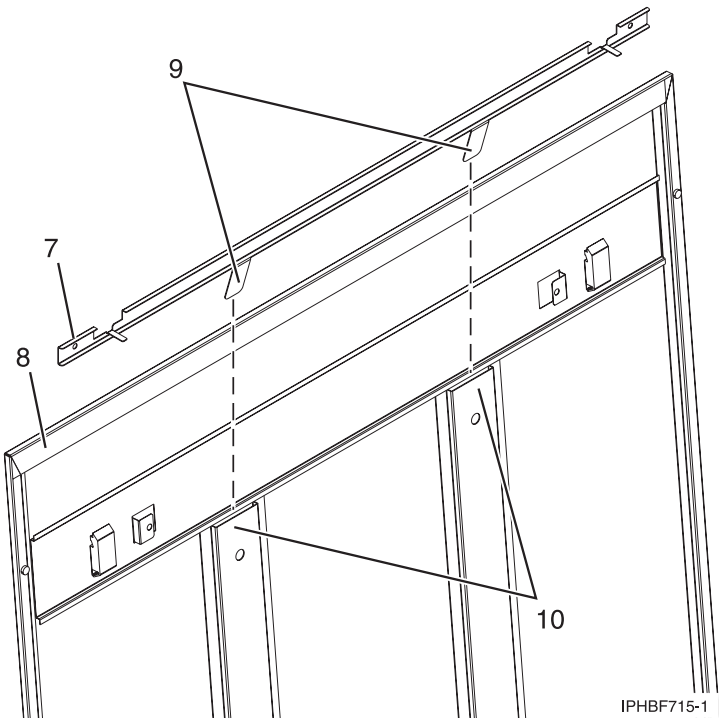


Figure 99. Installing a security slide bar

Note: Each slide bar rail has two long tabs on the bottom of the rail. The slide bar rails are identical and can be installed on either the right or left side cover panel.

a. Unlatch right-side cover panel and lean the panel back so that you can access the top of the panel.
b. With the flat side of the slide bar rail **(7)** in Figure 99, facing the inside of the cover panel **(8)**, insert the two tabs **(9)**, on the slide bar rail into the two vertical support channels **(10)** on the side cover panel.

   Note: When installed correctly, the slide rail moves from front to back.
c. Reinstall the side panel cover on to the rack.
d. Lock the side panel covers by sliding the bars to the front of the rack.
e. Place a locked/unlocked sticker on the inside of the cover panel so that when the slide bar is in the locked position, the tab is over the locked symbol **(11)**, as shown in Figure 100 on page 102, and over the unlocked symbol **(12)**, when the slide bar is unlocked.

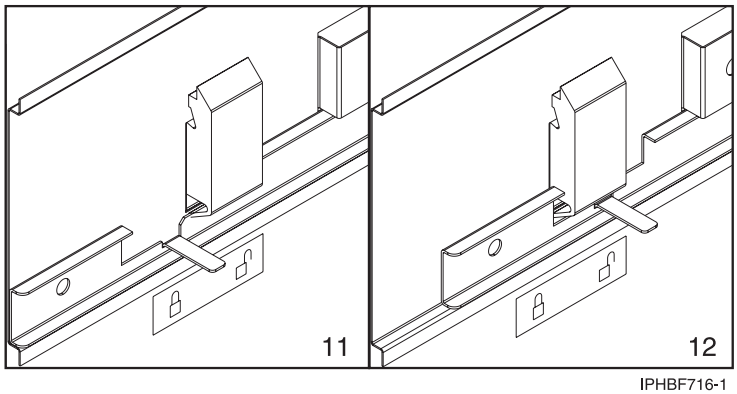


Figure 100. Placing the locked/unlocked sticker on the cover panel

f. Repeat the procedure for the left side of the rack.

Chapter 7. Ruggedized kit

You might need to remove or replace a part in the ruggedized kit. This section includes procedures so that you can perform these tasks.

The ruggedized kit, feature code 6080, should be ordered at the same time the rack is ordered. The ruggedized kit brackets are installed at the manufacturer.

Note: If you are installing a rack with the ruggedized kit and need to secure the rack to the floor, refer to Chapter 2, "Installing the rack," on page 3.

The following illustration highlights the contents of the kit and the approximate location of each bracket and hinges in the event that you need to uninstall and reinstall a part.

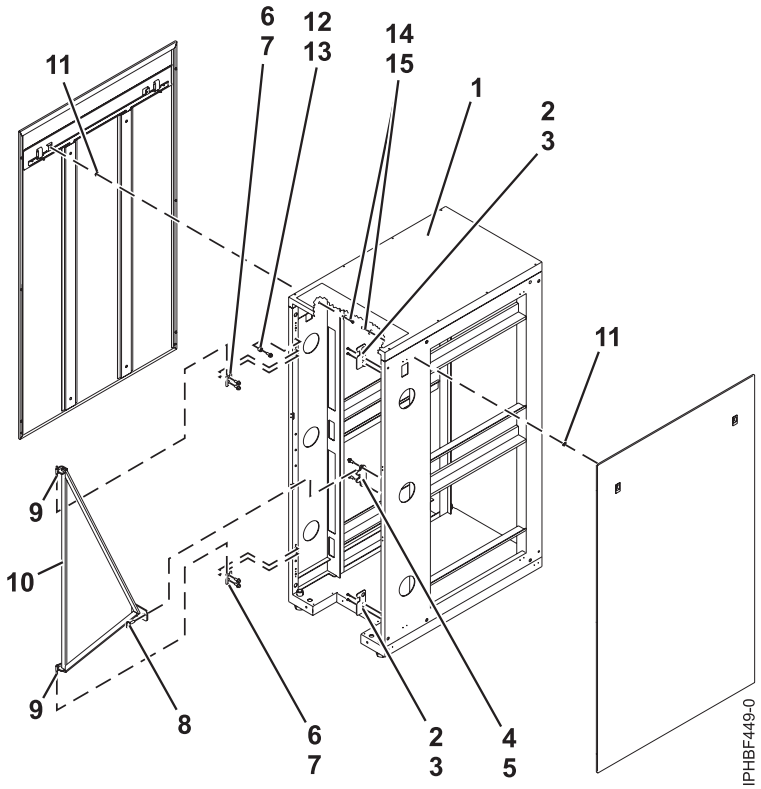


Figure 101. Ruggedized kit parts

1. Rack
2. Spacer
3. Brace hinge
4. Hinge pivot studs
5. Brace latch bracket
6. Spacer
7. Screw
8. Brace thumbscrew
9. Brace hinges
10. Brace
11. Side-door securing screw mount
12. Spacer
13. Screw
14. Washer
15. Side door securing screw

Releasing the ruggedized brace

You might need to release the ruggedized brace. Use the procedure in this section to perform this task.

To access the back of a system that is installed in a rack with a ruggedized kit, complete the following steps to release the ruggedized brace:

1. Remove the brace thumbscrew **(8)**.

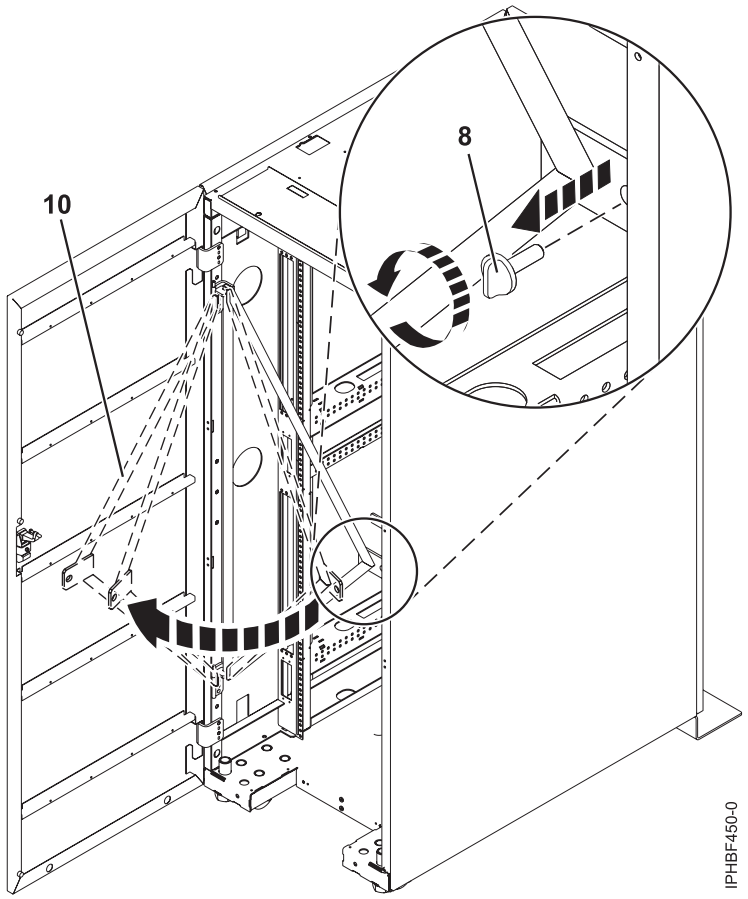


Figure 102. Releasing the brace to access systems

2. Swing the brace **(10)** out of the rack.
3. Access the system and reinstall the brace.

Releasing the side panel with a ruggedized kit

You might need to release the side panel on the rack. Use this procedure to perform this task.

The ruggedized kit contains securing screws that secure the side panels to the rack. To remove a securing screw, complete the following steps:

1. If necessary, open or remove the back rack door.
2. Locate the securing screw mount **(11)** for the side door that will be removed.

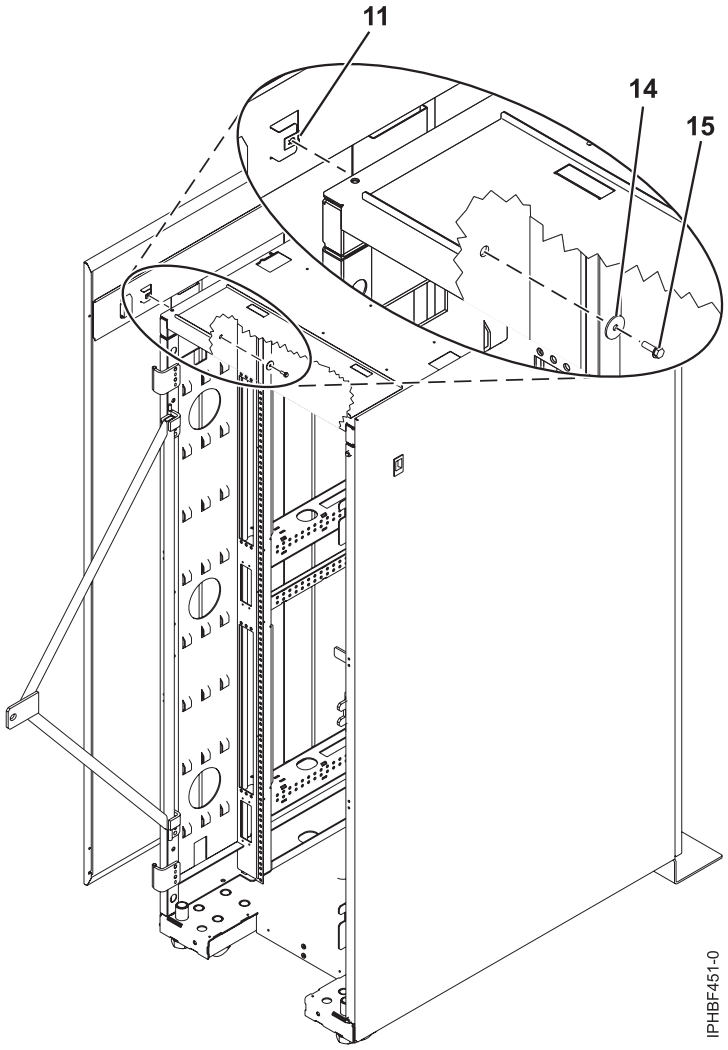


Figure 103. Removing the securing screws on the side panel

3. Using a screwdriver, remove the securing screw **(15)** and washer **(14)** from the side panel. To remove the side panel, see Chapter 4, "Removing and replacing 0551, 0553, 7014-T00, or 7014-T42 side panels," on page 93.

Chapter 8. Connecting multiple racks with rack-to-rack attachment kit

You might need to connect multiple racks together. Use the procedure in this section to perform this task.

This topic describes how to connect multiple racks to each other using a rack-to-rack attachment kit. To do this, you will need the rack-to-rack attachment kit (feature 7840).

To connect multiple racks with the rack-to-rack attachment kit follow this procedure:

1. Read the "Rack safety notices" on page 96.
2. If they are installed, remove the side panels from each rack. Remove side panels only from the sides that will be attached to each other. To do this:
   a. Lift up the two panel-release tabs.
   b. Pull the panel up and away from the rack chassis. This motion will release the panel from the two lower J brackets.
   c. Store the side panels.
3. Remove the two Z brackets and the two J brackets. These brackets are used to hang the side panels.
4. Install the first two standoffs in the upper-left and lower-right corners of the first rack as shown in Figure 104 on page 108.
5. Install the second two standoffs in the upper-left and lower-right corners of the second rack as shown in Figure 104 on page 108.
6. Attach the long foam as shown in Figure 104 on page 108. For a model T42 rack, join the short foam to the end of the long foam, and adhere it to the frame length of the rack.
7. Position the racks together.
8. Align the standoff holes. You might need to adjust the leveling feet to do this.
9. Install a screw and washer into all four positions, but do not tighten.

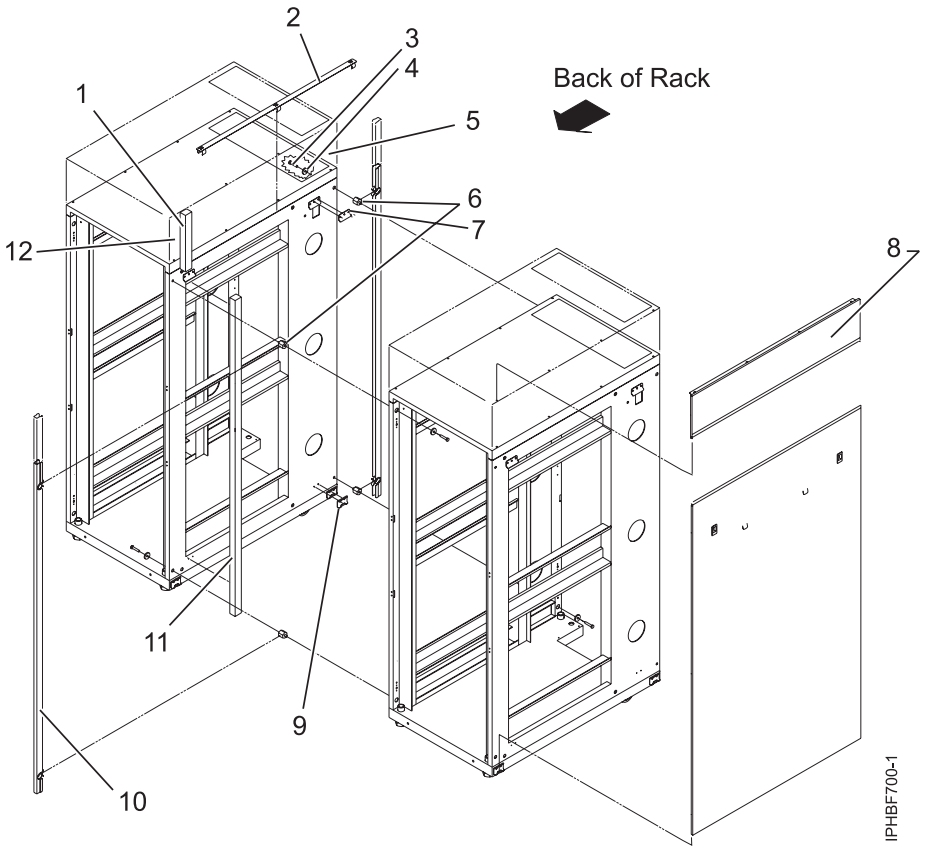


Figure 104. Removing the side panels, Z and J brackets, and installing standoffs and long foam to connect multiple racks

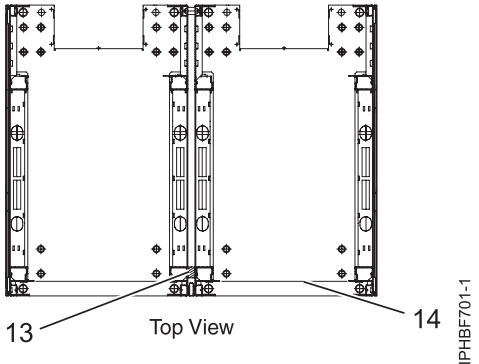


Figure 105. Location of foam strips (top view)

10. After all racks are bolted together, level the racks.
11. Tighten all four screws.
12. Snap on the trim pieces that go between the front and back racks.
13. Snap on the trim piece that goes on top and between the racks.
14. Install rack filler panels to cover the open areas at the front of the racks. All the gaps in the front of the rack must also be sealed, including the gaps between equipment. This step ensures that proper airflow within the rack is maintained.
15. Connect the cables that go between the racks.

16. If you are installing tip plates, go to step 5 in Chapter 2, “Installing the rack,” on page 3.

Chapter 9. Rack status beacon

The rack status beacon is placed on top of a rack and cabled to multiple system units inside the rack. The server firmware illuminates the rack status beacon in response to any detected problems in the status. This helps you locate the problem more quickly.

This is a customer task. You can perform this task yourself, or contact an service provider to perform the task for you. The service provider might charge you for this service.

These procedures assume that the system units have been installed into the rack and have been connected to the power supply. If the system units have not been installed, refer to the installation instructions for your system unit.

Installing the rack status beacon

You might need to install the rack status beacon. Use the procedure in this section to perform this task.

To install the rack status beacon, you need the following:

- Rack status beacon assembly.
- Two or more rack status beacon cables. You need one cable to connect the beacon to the junction box and one for each system unit that you want to connect to the beacon.
- One or two power cords.
- One or more junction boxes for the rack status beacon.
- One or more junction box cables.

To install the rack status beacon, follow these steps:

1. Place the rack status beacon **(A)**, on top of the rack so that the light is pointing to the front of the rack.

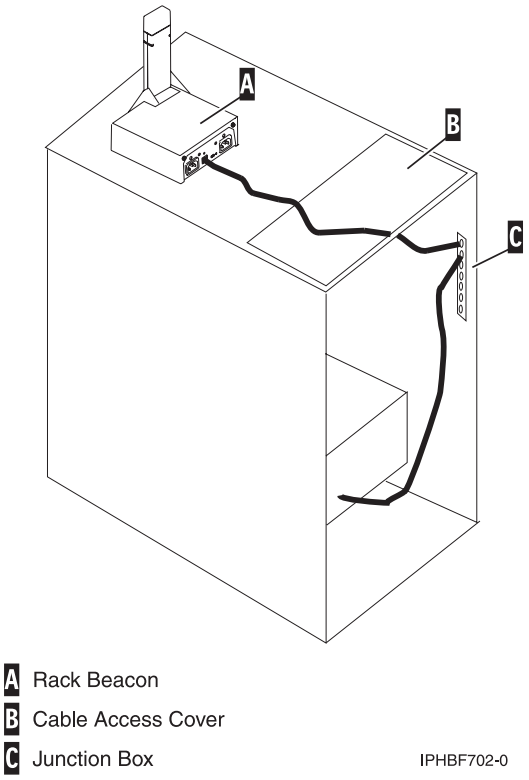


Figure 106. Connecting the rack status beacon to the system unit through the junction box

2. Plug one end of the rack status beacon cable **(1)** into the port on the back of the rack status beacon assembly.

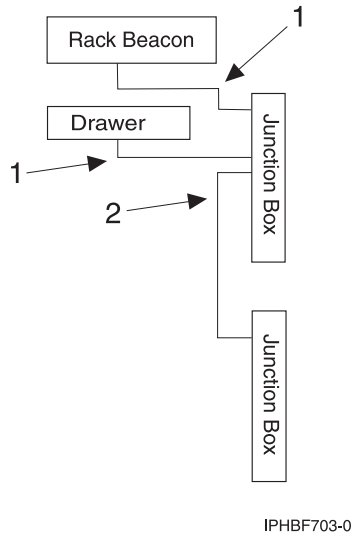
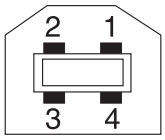


Figure 107. Connecting the rack status beacon and system unit to the junction box

3. Thread the rack status beacon cable through the rack's cable access cover, **(B)**.
4. Plug the other end of the rack status beacon cable into the output port on the junction box, **(C)**.
5. To connect the junction box to the system unit, plug one end of a rack status beacon cable **(1)**, into an input port on the junction box.

6. Plug the other end of the second rack status beacon cable into the beacon port on the system unit. This port is labeled with a beacon symbol.

   Note: On some system units, the orientation of the port is rotated.



IPHBF704-0

Figure 108. Rack status beacon port

7. To add additional system units to this rack status beacon, repeat steps 4 and 5 for each additional system unit. You can connect multiple junction boxes to add additional system units. Refer to "Connecting multiple junction boxes."
8. Plug the power cords into the rack status beacon assembly. Only one power cord is required, but you can use two power cords for backup.
9. Plug the other end of the power cords into the rack power supply.

If you install the rack status beacon during initial server setup, the initial program load (IPL) will read the rack identification information. If you install the rack status beacon on system units that are running, you will need to start the system again.

Connecting multiple junction boxes

You might need to connect multiple junction boxes. This section includes procedures so that you can perform these tasks.

You can connect multiple junction boxes so that additional system units can be added to the rack status beacon.

To connect multiple junction boxes, you need the following additional equipment:

- One or more rack status beacon junction boxes.
- One or more junction box cables. You need a junction box cable for each junction box that you want to add.

1. Plug the one end of the junction box cable **(2)**, into an input port on the first junction box.

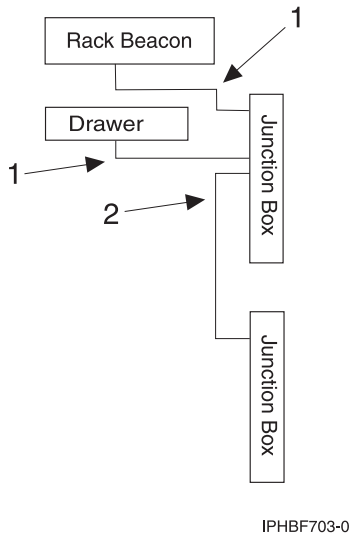


Figure 109. Connect the rack status beacon and system unit to the junction box

2. Plug a junction box cable into the output port of the additional junction box.
3. Connect additional system units to the additional junction box as described in "Installing the rack status beacon" on page 111.
4. Repeat steps 1 - 3 for each additional junction box.

Chapter 10. Installing or removing a rack-mounted system-unit latch bracket

You might need to install or remove a latch bracket. Use the procedure in this section to perform this task

These procedures describe how to install or remove the rack-mounted system-unit latch bracket. You can perform this task yourself, or contact a service provider to perform the task for you. The service provider might charge you for this service.

To install or remove a latch bracket, complete the following steps:

Note: The illustrations in these procedures may differ from your machine type and model.

1. Read the "Rack safety notices" on page 96.
2. Open the front rack door.
3. Push the latch bracket **(A)** or **(B)** into place on the side of the system unit.

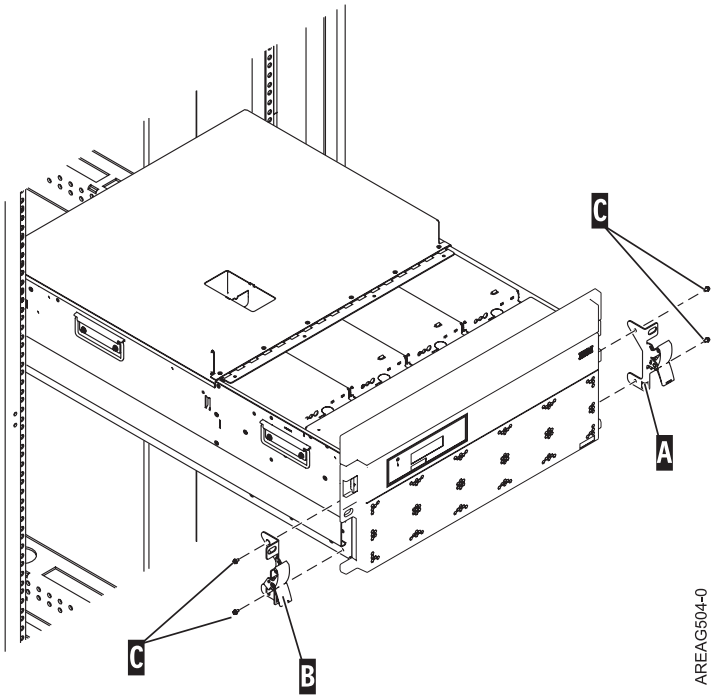


Figure 110. Reinstalling the latch brackets

4. Secure the latch bracket with two retaining screws **(C)** on the side of the latch bracket.
5. Replace the front cover. See Chapter 13, "Removing and Replacing Covers and Doors," on page 133.
6. Close the front rack door.

To remove a latch bracket, complete the following steps:

1. Remove the cover from the front of the system. See Chapter 13, "Removing and Replacing Covers and Doors," on page 133.
2. Place the system in the service position. See the service guide for your model.
3. Remove the retaining screws **(C)** located on the side of the latch bracket **(A)** or **(B)**.

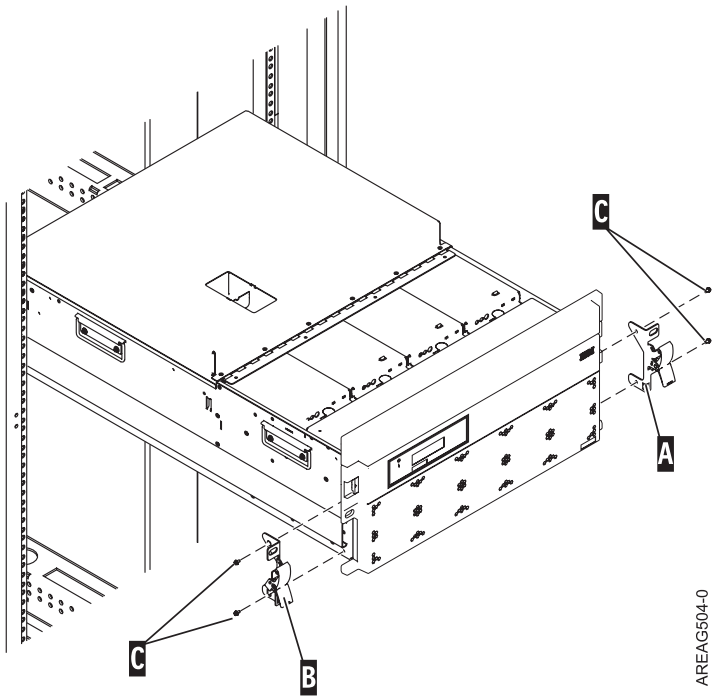


Figure 111. Removing the retaining screws

4. Remove the latch bracket from the system unit.

Chapter 11. Power distribution unit plus

The power distribution unit plus (PDU+) can be installed in the 7014-T00 and 7014-T42 racks. It allows you to monitor the individual power loads of the devices that are plugged into it.

Installing the PDU+ in the side of a rack

Learn how to install the power distribution unit plus (PDU+) in the side of a rack.

Tip: Removing the rack doors and side panels might make installation easier.

Important: You must use clip nuts to install the mounting brackets. Clip nuts are provided with the PDU+ and install on the rack-mounting flanges.

To install the PDU+ in the 1U mounting space in the side of a rack, complete the following steps

1. Read the "Rack safety notices" on page 96.
2. Align the vertical-mounting brackets to the front of the PDU+. Make sure that you attach the brackets so that the power outlets face the rear of the rack.

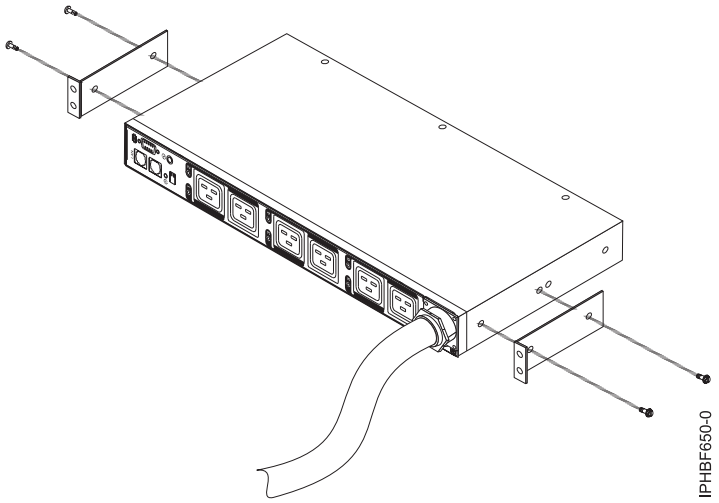


Figure 112. Aligning the vertical-mounting brackets to the front of the PDU+

3. Attach the brackets to the PDU+ with two M3x5 screws per bracket. Use the screws that were provided with the PDU+.
4. Align the PDU+ with the opening in the side of the rack. Then, while holding the PDU+ in place, attach the brackets to the rack-mounting flanges with four clip nuts and four M5 screws that were provided with the PDU+.

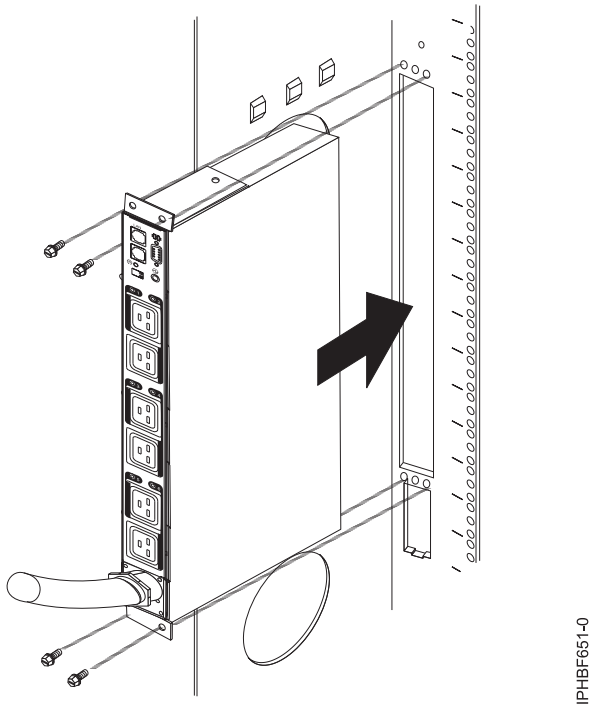


Figure 113. Aligning the PDU+ with the opening in the side of the rack

Attention: You must disconnect the main input power before connecting or disconnecting the input power cord from the PDU+.

5. If the PDU+ was provided with a detached power cord, connect the power cord now. Align the connector on the power cord that was provided with the PDU+ with the connector on the front of the PDU+, turning as necessary for key alignment. Then, turn the twist-lock on the connector clockwise until it locks into place.

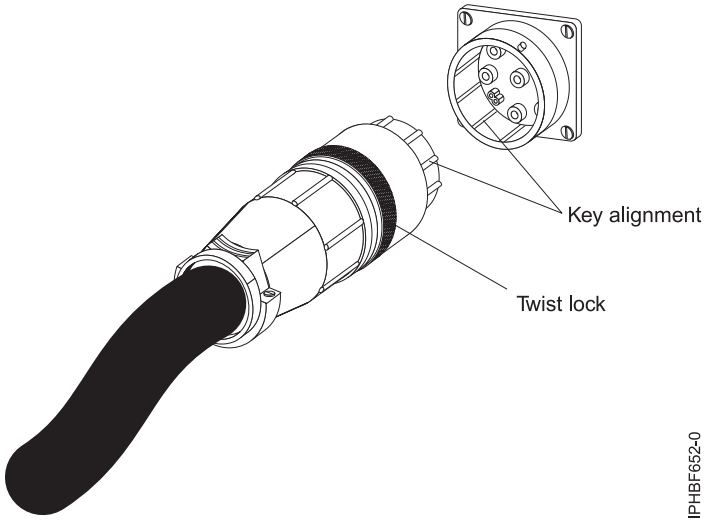


Figure 114. Aligning the connector on the power cord with the PDU+

6. Route the power cord from the PDU+ toward the rack side braces. Then, route the power cord along a side brace toward the back of the rack and secure the power cord with the cable straps that are provided with the PDU+.
7. Route the power cord toward a dedicated power source. Use the provided cable straps to secure the power cord along the way. Use the openings in the rack, if the power cord must exit the rack to connect to a power source.

   Attention: To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device.
8. Connect the power cord to a properly wired and grounded dedicated power source. Then, you can connect servers or rack PDUs in the rack to the power outlets on the PDU+.
9. Route all of the other power cables neatly and secure the power cables with cable straps.

Related concepts

"Setting up power monitoring using the PDU+" on page 123
You can monitor the power status for any device that is connected to the power distribution unit plus (PDU+), either manually or remotely, through the PDU+ Web interface. You can use the IBM DPI® Configuration Utility to initially set up the PDU+ and to configure PDU+ settings such as network parameters, access control table, and trap receivers table.

Installing the PDU+ horizontally in a rack

You might need to install the PDU horizontally, use the instructions in this section to complete this task.

Tip: Removing the rack doors and side panels might make installation easier.

Important: Use cage nuts for rack cabinets with square holes, and use clip nuts for rack cabinets with round holes. If your rack cabinet requires cage nuts, use a cage-nut-insertion tool or a flat-blade screwdriver to install them..

To install the PDU+ in the rack, complete the following steps

1. Read the "Rack safety notices" on page 96.
2. Align the vertical-mounting brackets to the front of the PDU+. Make sure that you attach the brackets so that the power outlets face the rear of the rack.

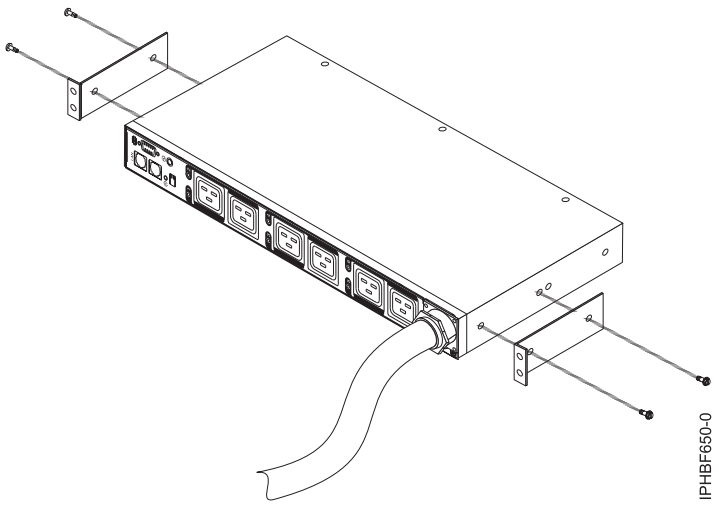
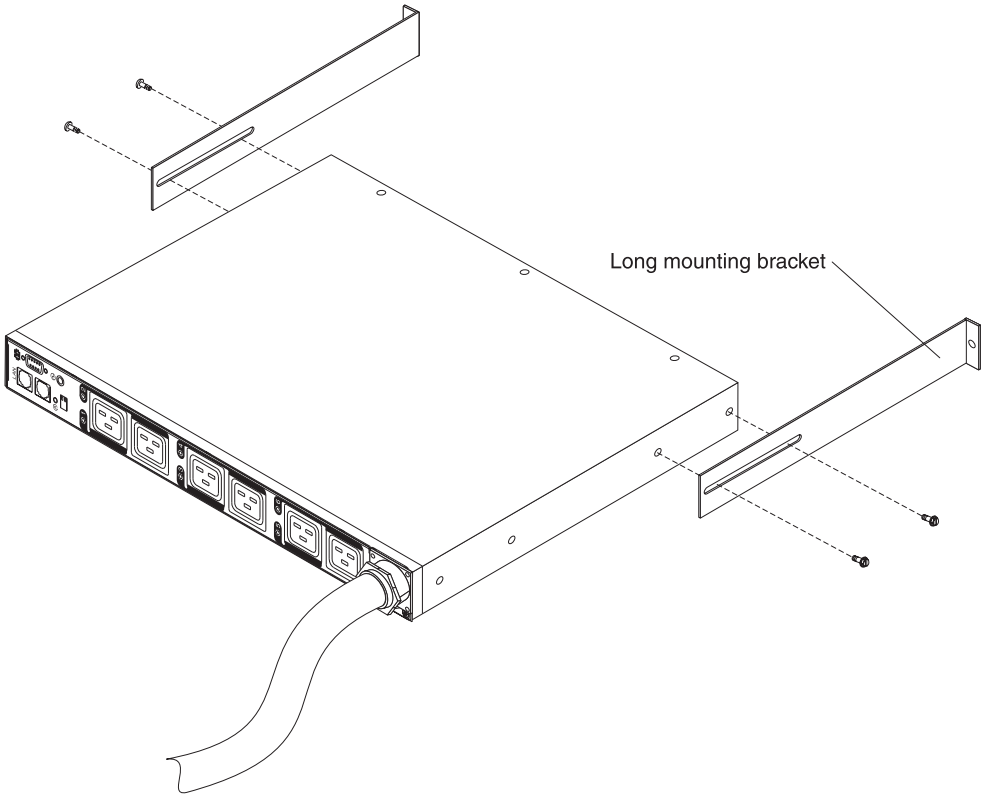


Figure 115. Aligning the vertical-mounting brackets to the front of the PDU+.

3. Align the long mounting-brackets with the holes in the rear of thePDU+ and attach the brackets to the PDU+ with two M3 pan-head screws with captive lock washers per bracket. Use the screws that

come with the rack-mounting kit.



4. Hold the PDU+ at a slight angle and carefully insert it into the 1-U mounting space in the rack cabinet. Pushing in slightly on both of the long mounting-brackets helps clear the brackets from the rack flanges.

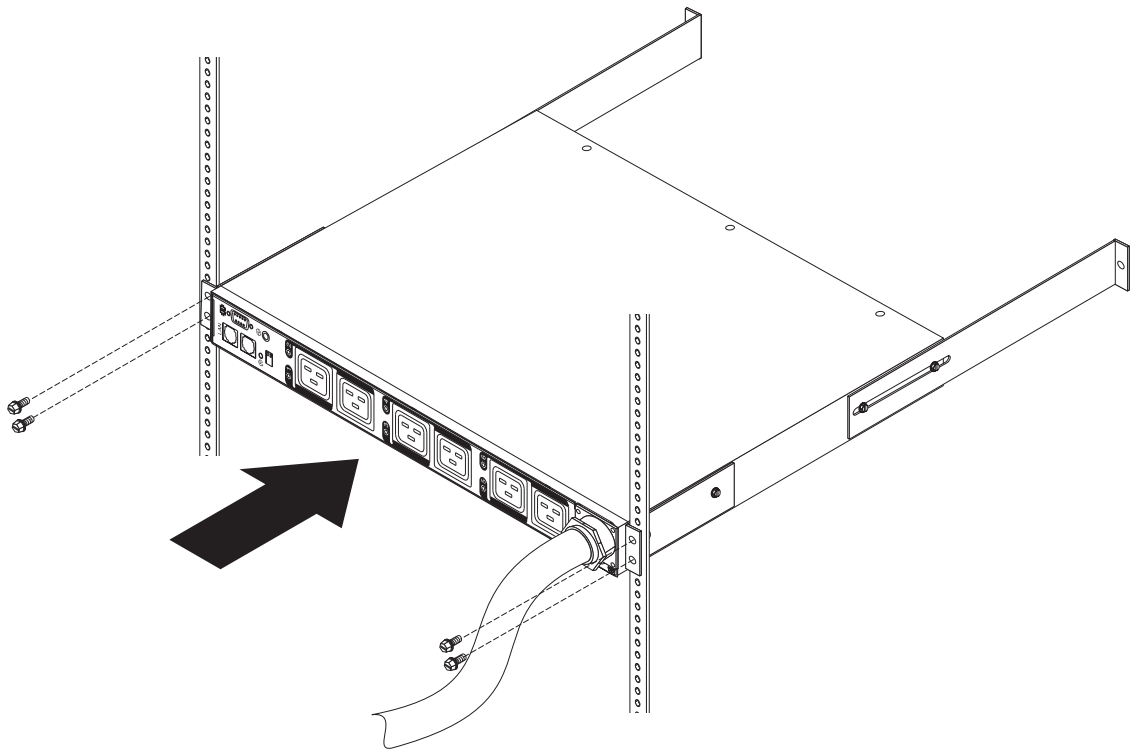
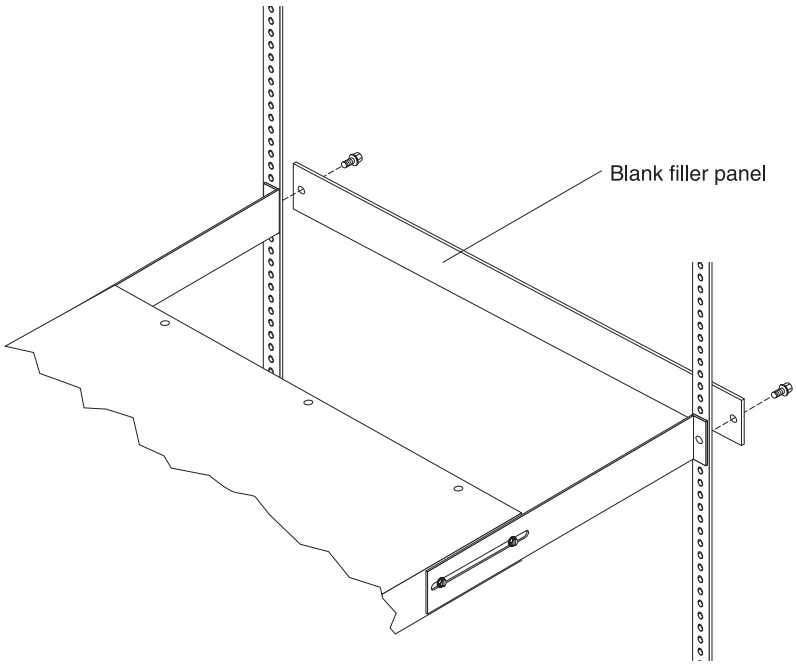


Figure 116. Aligning the PDU+ with the opening in the rack.

Attention: You must disconnect the main input power before connecting or disconnecting the input power cord from the PDU+.

5. Secure the end of the PDU+ that has the short mounting-brackets to the rack cabinet first. Make sure that the short mounting-brackets are aligned with the outside of the rack flanges. Attach the brackets to the rack flanges with two M6 screws and two cage nuts or clip nuts per bracket. Use the cage nuts or clip nuts and the screws that come with the rack-mounting kit.
6. Secure the long mounting-brackets and the 1-U blank filler panel to the rack cabinet by doing the following:



a. Adjust the long mounting-brackets to fit the depth of the rack cabinet.
b. Make sure that the long mounting-brackets are aligned with the inside of the rack flanges.
c. Align the blank filler panel on the outside of the rack flanges.
d. Attach the filler panel to the rack flanges and then to the long mounting-bracket with one M6 screw per bracket.
e. Tighten the M3 pan-head screws that secure the long mounting-brackets to the PDU.

7. Secure the end of the PDU+ that has the short mounting-brackets to the rack cabinet first. Make sure that the short mounting-brackets are aligned with the outside of the rack flanges. Attach the brackets to the rack flanges with two M6 screws and two cage nuts or clip nuts per bracket. Use the cage nuts or clip nuts and the screws that come with the rack-mounting kit.
8. If the PDU+ was provided with a detached power cord, connect the power cord now. Align the connector on the power cord that was provided with the PDU+ with the connector on the front of the PDU+, turning as necessary for key alignment. Then, turn the twist-lock on the connector clockwise until it locks into place.

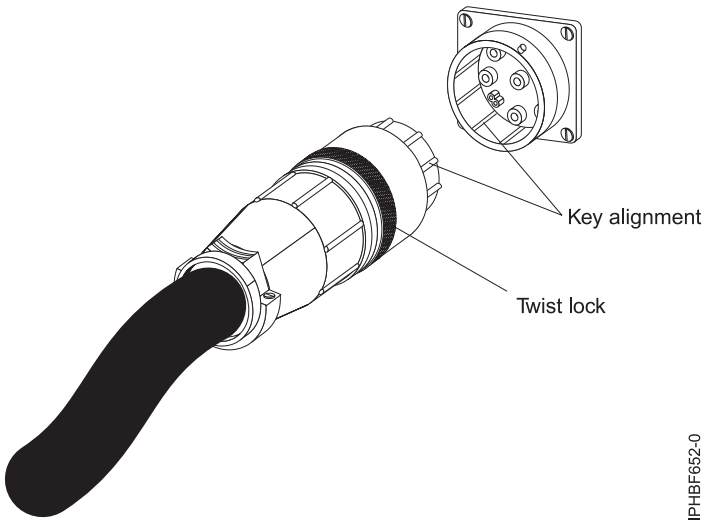


Figure 117. Aligning the connector on the power cord with the PDU+.

9. Route the power cord from the PDU+ toward the rack side braces. Then, route the power cord along a side brace toward the back of the rack and secure the power cord with the cable straps that are provided with the PDU+.
10. Route the power cord toward a dedicated power source. Use the provided cable straps to secure the power cord along the way. Use the openings in the rack, if the power cord must exit the rack to connect to a power source.

    Attention: To prevent damage to a power device and other connected devices, always connect the power device to an authorized power source for that device.
11. Connect the power cord to a properly wired and grounded dedicated power source. Then, you can connect servers or rack PDUs in the rack to the power outlets on the PDU+.
12. Route all of the other power cables neatly and secure the power cables with cable straps.

Setting up power monitoring using the PDU+

You can monitor the power status for any device that is connected to the power distribution unit plus (PDU+), either manually or remotely, through the PDU+ Web interface. You can use the IBM DPI Configuration Utility to initially set up the PDU+ and to configure PDU+ settings such as network parameters, access control table, and trap receivers table.

Note: All of the Configuration Utility configuration options are available through the Web interface after the PDU+ is set up on the local network.

Related tasks

"Installing the PDU+ in the side of a rack" on page 117
Learn how to install the power distribution unit plus (PDU+) in the side of a rack.

Using the IBM DPI Configuration Utility

Learn how to use the IBM DPI Configuration Utility to configure the power distribution unit plus (PDU+) settings, such as the IP address, network parameters, access control table, and trap receivers table.

Connecting the console

You can configure the PDU+ using a workstation or notebook computer that is connected to the PDU+. Connect the DB9-to-RJ-45 cable that is shipped with the PDU+ to the RJ-45 console connector on the PDU+, and to a RS-232 serial (COM) connector on a workstation or notebook computer.

Using HyperTerminal

HyperTerminal is a terminal program in a Microsoft® Windows® operating system that enables you to configure or control a device using command line parameters. You can configure the PDU+ parameters and its outlets using numeric commands from a keyboard. You can also use Telnet or any other terminal program to configure the PDU+ after the IP address is set.

To start HyperTerminal and communicate with the PDU+, complete the following steps:

1. Click **Start** → **Programs** → **Accessories** → **Communications** → **HyperTerminal**. The Connection Description window is displayed.
2. Type the name for the connection in the **Name** field and select an icon for the connection.
3. Click **OK**. The Connect To window is displayed.
4. In the **Connect using** field, select the COM port that is connected to the PDU+.
5. Click **OK**. The Properties window is displayed.
6. Click **Restore Defaults** to use the default settings. Make sure that the **Bits per second** field is `9600` and that the **Flow control** field is `None`.
7. Click **OK**.
8. Press any key. The Configuration Utility main menu is displayed.
9. Type the default password, `passw0rd` (all lowercase letters with a zero, not O), and press Enter.
10. Enter the menu option that you want. For descriptions of the options, see "Configuration Utility menu options."

Configuration Utility menu options

The following options are on the Configuration Utility main menu:

IBM DPI Settings

When you select IBM DPI Settings, the IBM DPI Configuration Utility window is displayed with the following options:

Set the IP Address, Gateway Address and MIB System Group

View and change the IP address, date, time, and MIB system information.

Set IBM DPI Control Group

Set the administrator user name, password, and access protocols.

Set Write Access Managers

Set up a list of users who can access and control the PDU+.

Set Trap Receivers

Configure remote network management system (NMS) servers to receive traps.

Set Date and Time

Adjust the date and time information for the PDU+.

Set Superuser Name and Password

Set the user name and password of the administrator who will use a Web browser to configure the PDU+.

E-mail Notification

Set up a list of users who will be alerted with event messages if an unusual event is triggered on the PDU+ system.

Set Multi-Users
Configure other user and password logins and the read and write access levels.

Set IBM DPI Information
Configure the PDU+ logging interval, refresh rate, and custom name fields for the load groups.

Settings and Event Log Summary
View all PDU+ configuration settings.

Reset Configuration to Default
Reset all system settings to their factory default values.

Restart HD-PDU
Restart the PDU+.

Setting the IP address

Important: You must set the IP address before you can use the Web interface or access the PDU+ in an IP network (LAN/WAN). Contact your system administrator if you do not know the IP address.

To set the IP address, complete the following steps:

1. In the Configuration Utility main menu, enter the menu option for **IBM DPI Settings**.
2. Enter the menu option for **Set the IP Address, Gateway Address and MIB System Group**.

Using the Web interface

Learn how to use the Web interface to configure and monitor the power distribution unit plus (PDU+) remotely. The PDU+ provides a graphical user interface that you can view from a Web browser. Using a Web browser, you can access and monitor the PDU+ power outlets and output devices remotely from a workstation or notebook computer.

Starting the Web interface

To start the Web interface, complete the following steps:

1. Start a Web browser from a workstation or notebook computer, and enter the IP address of the PDU+ in the **address** field. The **Connect to** window is displayed.

   Note: For more information about setting the IP address of the system, see "Setting the IP address."
2. In the **User name** field, type `USERID` (all uppercase letters).
3. In the **Password** field, type `passw0rd` (all lowercase letters with a zero, not O).
4. Click **OK**. The main status page is displayed.

The main status page displays a graphical representation of the PDU+ power outlets and input status:

- The left pane displays the menus and submenus for the PDU+. Click a menu to display the menu options, expand the menu items, and modify the menu options as required.
- The graphic displayed in the right pane shows the status of the outlets, input voltage, output voltage, frequency, current and power, watt-hour consumption, and cumulative kilowatt hour power consumption. If you connect an optional environmental monitored probe, the temperature and humidity environment conditions are displayed.

Each menu page provides online help to assist you with configuring the PDU+. Click the **Help** icon at the top of each page to view the help.

Modifying the basic settings

Use the System menu to configure the PDU+ system parameters such as the superuser name, password, IP address, date, and time.

Changing the superuser name and password:

You can set the user name and password of the administrator who will use a Web browser to configure the PDU+ on the Configuration Utility page.

To change the superuser name and password, complete the following steps:

1. From the main status page, in the left navigation pane, click **System**.
2. Click **Configuration** to view and modify the system configuration and superuser user name and password.

Identifying the PDU+ and Web/SNMP card:

You can view the PDU+ and Web/SNMP card information on the Identification of Power Management page.

To view the power management information of the PDU+ and Web/SNMP card, complete the following steps:

1. From the main status page, in the left navigation pane, click **System**.
2. Click **Identification** to view the PDU+ and Web/SNMP card information.

Adding users:

You can add users who can access and control the PDU+ on the Multi-User Configuration page.

To create a list of users who can access and control the PDU+, complete the following steps:

1. From the main status page, in the left navigation pane, click **System**.
2. Click **Multi-User** to add users who can only view the PDU+ status or users who can change the PDU+ settings.

Changing the date and time:

You can change the date and time of the PDU+ on the Date and Time page.

Important: Changing the PDU+ date and time affects other system settings such as e-mail, traps, and logs.

To change the date and time, complete the following steps:

1. From the main status page, in the left navigation pane, click **System**.
2. Click **Date and Time** to view and modify the system date and time. You can set the date and time manually, synchronize it with the computer time, or synchronize it with an NTP server.

Changing event alerts:

You can change event alerts on the SNMP Trap Receivers page.

To configure the PDU+ to send e-mail or SNMP trap alerts to specified users when specific events occur, complete the following steps:

1. From the main status page, in the left navigation pane, click **System**.
2. Click **Trap Receivers** to create a list of users or workstations who will be alerted with an SNMP trap message. You can specify the IP addresses of up to eight trap receivers, the community information, type of trap, severity of trap, and description of the events that cause the traps.

3. Click **Email Notification** under **System** to create a list of up to four users who will be alerted with an e-mail. Use this menu to specify the mail server, user account, DNS, and other information necessary to set up a mail server for sending mail alerts. Use the Email Receivers Table to add the e-mail addresses.

Changing the network information

Use the Network menu to change the network information for the PDU+, for example, the IP address.

Changing the network configuration:

You can view or change the network configuration on the Network Configuration page.

To view or change the network configuration of the PDU+, complete the following steps:

1. From the main status page, in the left navigation pane, click **Network**.
2. Click **Configuration** to set the PDU+ IP address, gateway address, subnet mask, and Domain Name System (DNS) address.
3. Click **Control** to configure TCP/IP settings.
4. Click **Access Control** to set access control to prevent unauthorized users from accessing the PDU+.

History and event log summaries

The Logs menu provides a detailed description of all events and a record of the PDU+ status. System administrators can use this page to analyze problems with network equipment.

Viewing the history log:

You can view the complete history of the PDU+ inputs and outputs on the History Log page.

To view the history of the PDU+, complete the following steps:

1. From the main status page, in the left navigation pane, click **Logs**.
2. Click **History**. Each event log file shows the time, date, and description of all the events occurring on the PDU+.

Viewing the event log:

You can view the complete record of the PDU+ events on the Event Log page.

To view the complete record of the PDU+ events, complete the following steps:

1. From the main status page, in the left navigation pane, click **Logs**.
2. Click **Events**. Each log file shows a record of the input power and output power of each outlet.

Chapter 12. Removing and replacing expansion unit cover or door

You might need to remove, replace, or install covers or doors on an expansion unit as a part of accessing components or performing a service action.

Removing the front cover on the 7314-G30 or 5796

You might need to remove the front cover to perform service to the system.

To remove the front cover follow these steps.

1. Remove the two thumbscrews **(B)** located on the left and right of the cover.

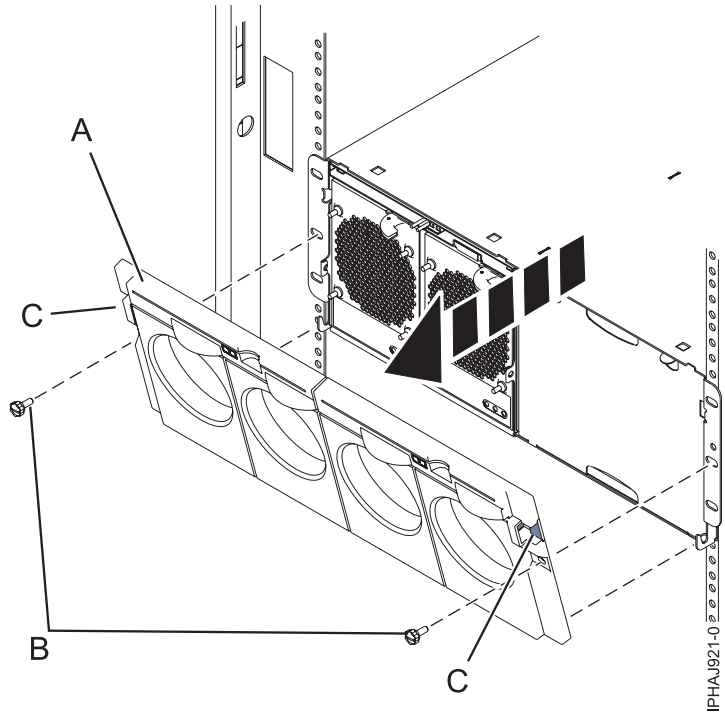


Figure 118. Remove the front cover for model 7314-G30 or 5796

2. Press in on the two latches **(C)** located left and right of the cover to release the cover.
3. Lift the cover **(A)** out and away from the chassis.

   Tip: If an airflow block is present on an unpopulated side of the chassis do not remove it unless you are populating that side of the chassis.

Installing the front cover on the 7314-G30 or 5796

Use this procedure to install the front cover after installing the system or performing a service action.

If you only have one side of the chassis populated, ensure that the airflow block is present on the unpopulated side.

1. Insert the posts on the bottom of the cover **(A)** into the hooks on the chassis of the enclosure.
2. Press in on the two latches **(C)** on the right and left of the front cover.

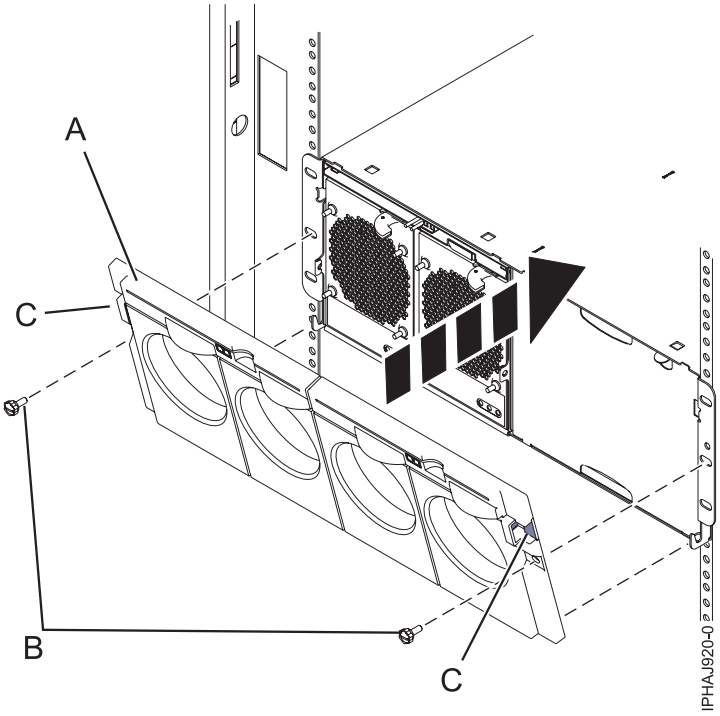


Figure 119. Front cover on a model 7314-G30 or 5796

3. Push the cover onto the chassis and release the latches. The cover should securely snap into place.
4. Replace the two thumbscrews **(B)** into the slots on the left and right of the front cover.

Removing the front cover from a 7311-D11, 5791, or 5794 expansion unit

Use this procedure to remove the cover to access components or perform a service action.

To remove the front cover, follow these steps:

1. Open the rack front door, if necessary.
2. Press down on both release tabs and pivot the cover from the top forward.
3. Pull the cover out and away from the expansion unit.

Installing the front cover on a 7311-D11, 5791, or 5794 expansion unit

Use this procedure to install the cover after accessing components or performing service.

To install the front cover, follow these steps:

1. Position the cover on the front of the expansion unit so that the pins on the cover line up with the slots on the front of the expansion unit.
2. Insert the tabs on the bottom of the cover into the slots at the front of the expansion unit.
3. Push the cover up and forward until the tabs on the top secure the cover in place.

Removing the front cover from a 7311-D20 expansion unit

Use this procedure to remove the cover to access components or perform service.

To remove the expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Remove the thumbs screws that are securing the covers to the rack.
3. Push both cover-release latches in the direction of the arrows to release the cover as shown in the following figure.

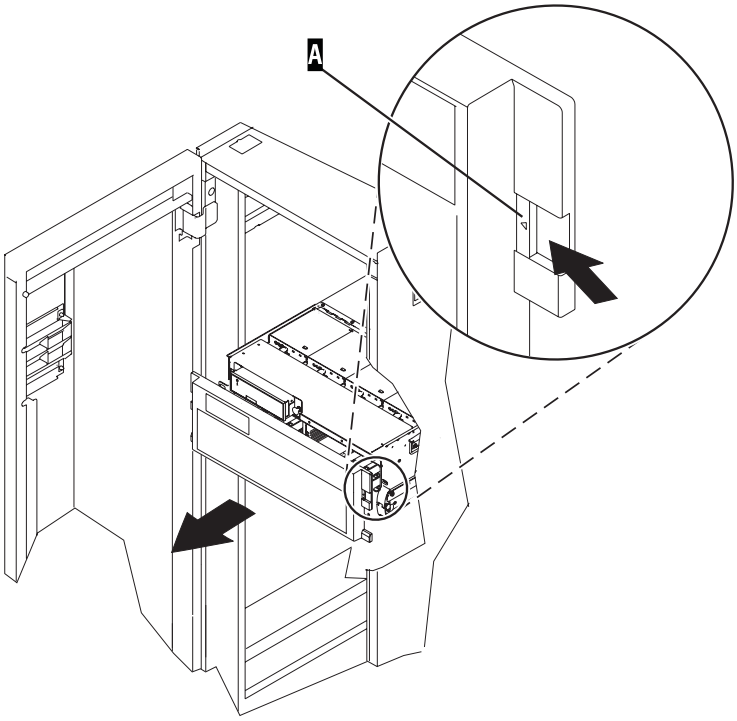


Figure 120. Removing the front cover

4. Pivot the cover from the bottom and swing the top of the cover out.
5. Pull the bottom of the cover up and then away from the expansion unit. This releases the two tabs located on the bottom of the cover.
6. Put the cover in a safe place.

Installing the front cover on a 7311-D20 expansion unit

Use this procedure to install the cover after accessing components or performing service.

To install the expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Insert the two tabs located on the bottom edge of the cover into their locking slots, located on the expansion unit frame.
3. Pivot the front cover up toward the top of the expansion unit frame.

4. Align the tabs to the matching slots located on the front of the expansion unit frame.
5. Gently push the tabs into the slots until the cover seats against the front of the expansion unit.
6. Install the thumbs screws to secure the covers to the rack.
7. Close the front rack door.

Chapter 13. Removing and Replacing Covers and Doors

Use these instructions to remove, replace, or install covers to access components or perform service.

Removing the service access cover from a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the service access cover to perform service or to gain access to internal components.

1. Place the system into the service position. For instructions, see "Placing a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50 in the service position" on page 147.
2. Loosen the two thumbscrews **(A)** located at the back of the cover.
3. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

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

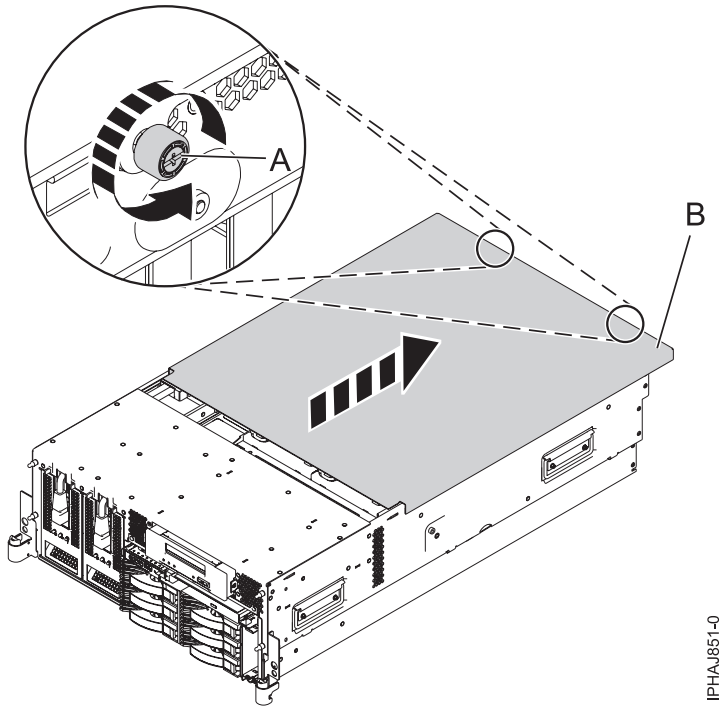


Figure 121. Remove the service access cover from a rack-mounted model

Installing the service access cover on a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the service access cover after performing service or accessing internal components.

1. Place the service access cover **(A)** on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.

2. Hold the service access cover against the system unit, and slide it toward the front of the system.
   The tabs on the service access cover slide beneath the upper chassis ledge, and the two thumbscrews align with the screw holes at the back of the system unit.

   Important: Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward.
3. Tighten the thumbscrews **(B)** located at the back of the cover.

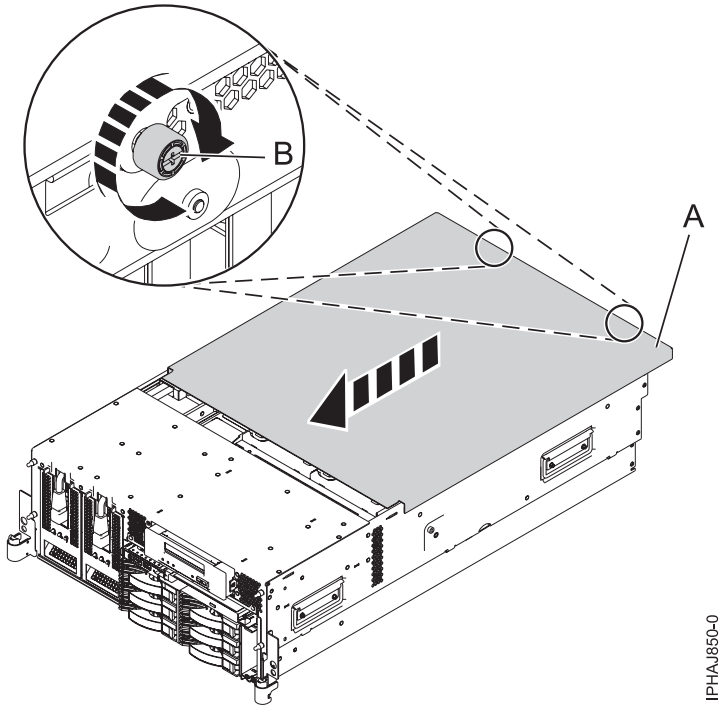


Figure 122. Install the service access cover on the rack-mounted model

Removing the service access cover from a stand-alone 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the service access cover to perform service or to gain access to internal components.

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

1. Loosen the two thumbscrews **(A)** located at the back of the service access cover as shown in the following figure.
2. Slide the service access cover **(B)** toward the back of the system. When the front of the cover clears the front frame ledge, lift the cover off the system.

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

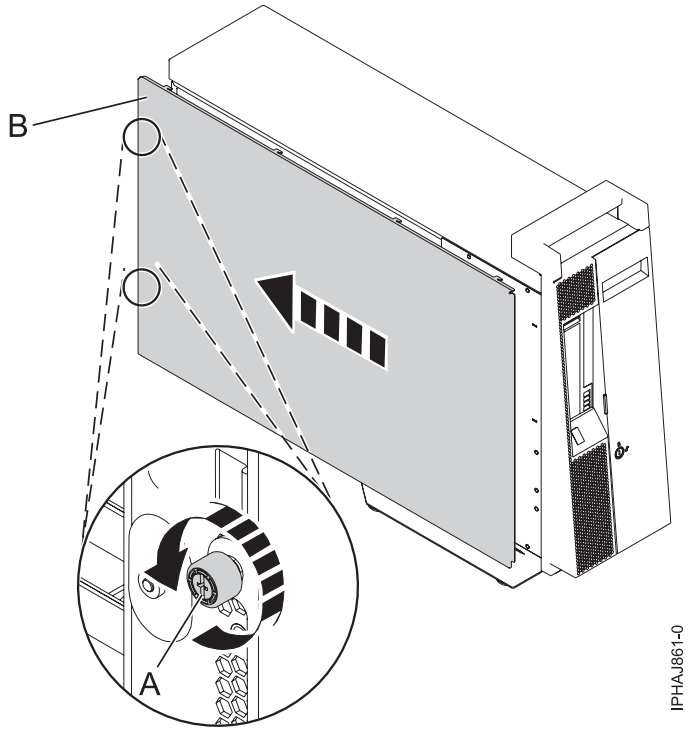


Figure 123. Removing the service access cover from the stand-alone model

Installing the service access cover on a stand-alone 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the service access cover after performing service or accessing internal components.

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

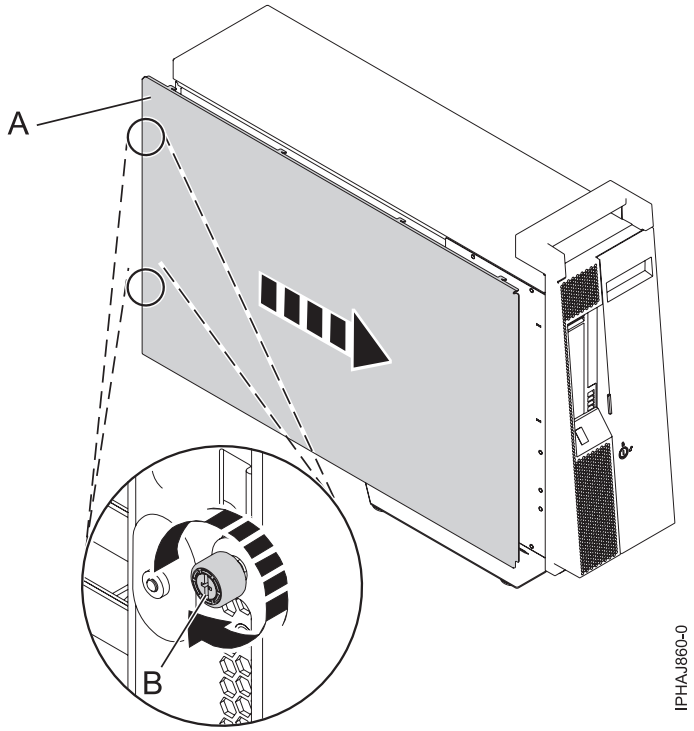


Figure 124. Installing the service access cover on a stand-alone model

Removing the front cover from a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the cover to access components or perform service.

1. Remove the two thumbscrews **(A)** that secure the system to the rack **(B)** as shown in the following figure.
2. Push in the release latches **(C)** and pull the cover away from the system.

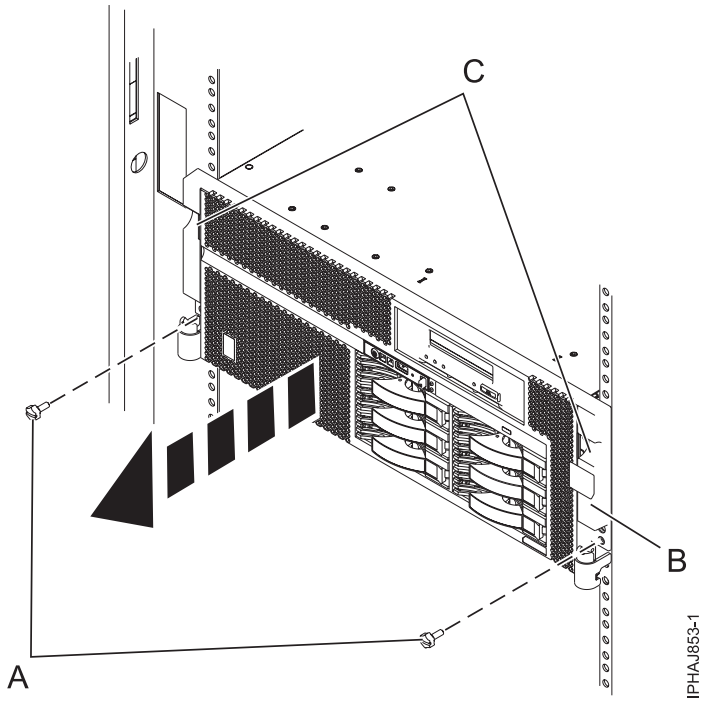


Figure 125. Removing the front cover from a rack-mounted model

Installing the front cover on a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the cover after accessing components or performing service.

1. Push in the release latches **(B)** and push the cover onto the system.
2. Gently push the cover in until the two cover-release latches **(B)** are seated in their respective slots as shown in the following figure.
3. Replace the two thumbscrews **(C)** that secure the system to the rack **(A)**.

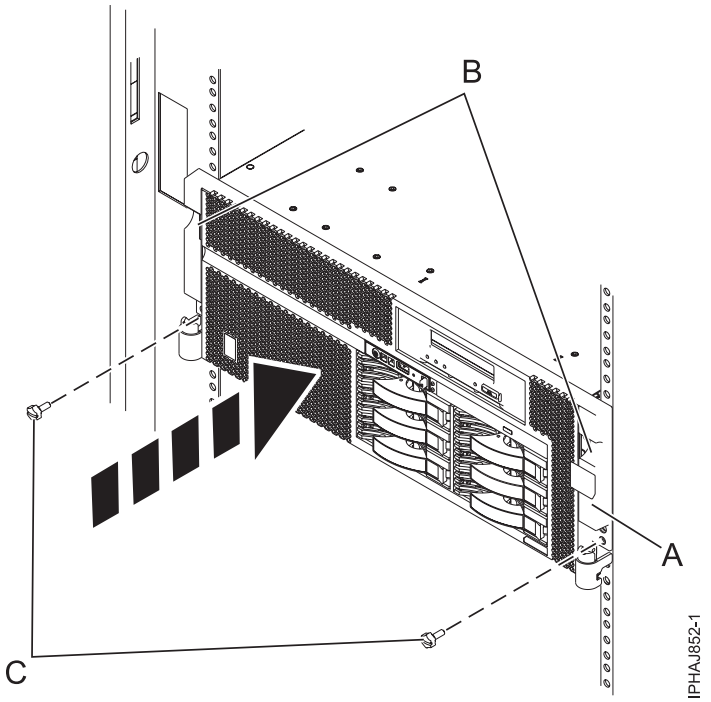


Figure 126. Installing the front cover on a rack-mounted model

Removing the door from the 8204-E8A or 9409-M50

Use this procedure to remove the door to access components or perform service.

1. Open the front door by grasping the door handle and pulling the door out and away from the system unit.
2. To remove the door, press down on the top back edge of the door.
3. Gently swivel the top back edge of the door forward and out past the top of the system unit.
4. Lift the door up to release it from the lower retaining post.

Installing or replacing the door on the 8204-E8A or 9409-M50

Use this procedure to install the door after accessing components or performing service.

1. Set the door on the lower retaining post.
2. Rotate the door toward the top of the system unit.
3. Press down on the lower back edge of the door, and seat the top post into its matching slot.
4. Close and secure the door.

Removing the front cover from the stand-alone 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the cover to access components or perform service.

1. Open the door that covers the disk drives by unlocking and pulling the door open.
2. Press down on the cover-release tab **(A)** as shown in the following figure.

3. Pull the top of the cover **(B)** out and away from the system.

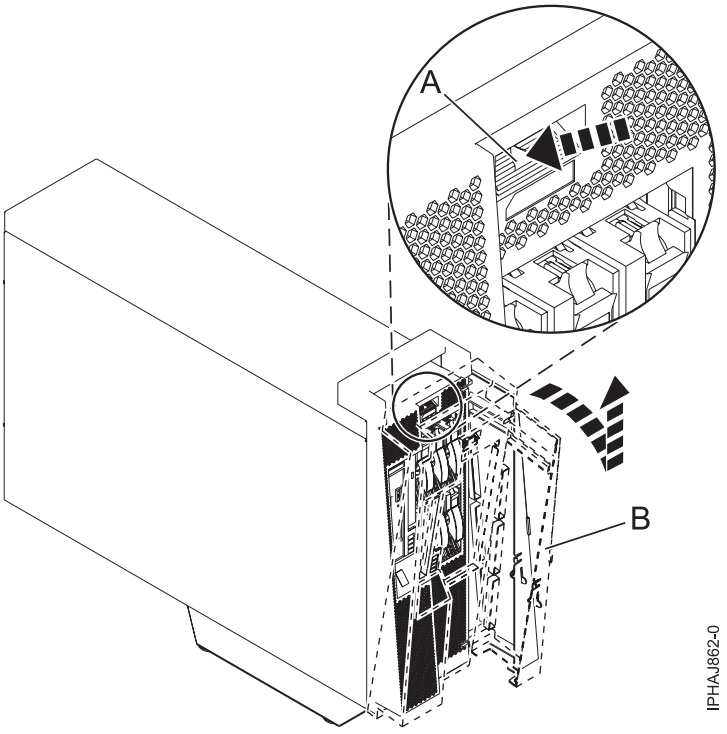


Figure 127. Remove the door from the model

4. Gently pull the cover up and off the base.

Installing the front cover on a stand-alone 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the cover after accessing components or performing service.

1. Place the two lower cover-locking tabs into the retaining slots located on the base of the system unit as shown in the following figure.

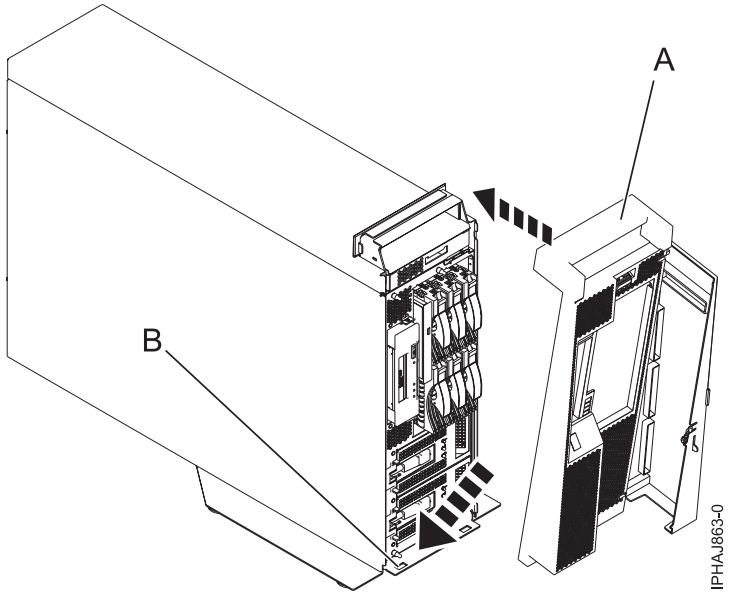


Figure 128. Replacing the cover on the model

2. Push the cover up toward the top of the system **(A)**, ensuring that the aligning pins are aligned with their matching slots **(B)** located on the system.
3. Gently push the cover in until the cover-release tab snaps into place.
4. Close and secure the door.

Front cover for the 8234-EMA, 9117-MMA, or 9406-MMA

Use these procedures to remove and replace the cover to access components or perform service.

Removing the front cover from the 8234-EMA, 9117-MMA, or 9406-MMA

Use this procedure to remove the cover to access components or perform service.

To remove the front cover follow these steps:

1. If necessary, open the front rack door.
2. Loosen the thumbscrew on the right side of the cover as shown in the following figure.

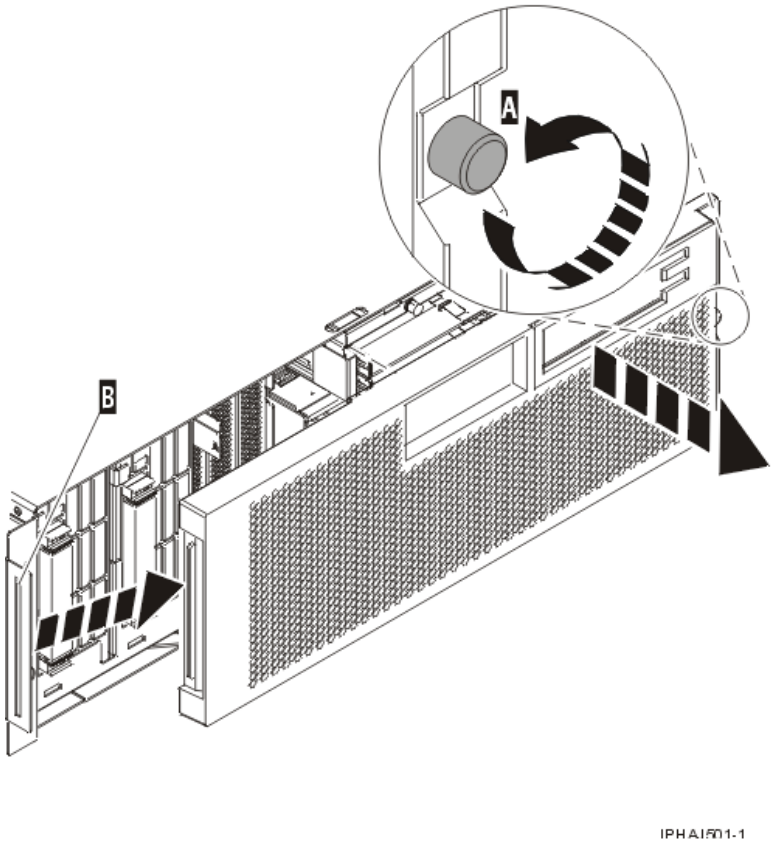


Figure 129. Removing the front cover

3. Slide the cover to the right, and remove it from the system unit.

Installing the front cover on the 8234-EMA, 9117-MMA, or 9406-MMA

Use this procedure to install the cover after accessing components or performing service.

To install the front cover follow these steps:

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot on the left side of the system unit as shown in the following figure.

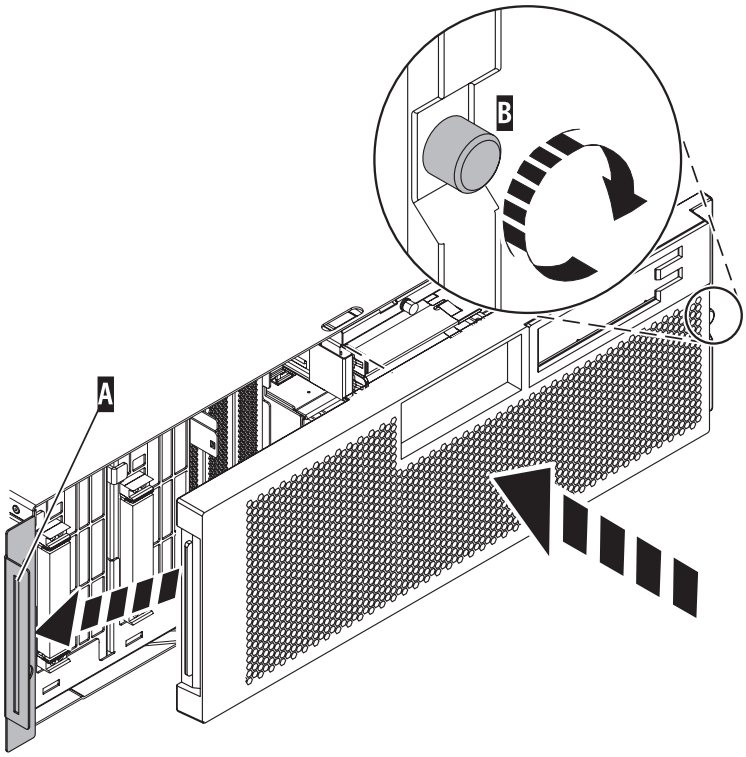


Figure 130. Installing the front cover

2. Tighten the thumbscrew on the right side of the cover.
3. Close the front rack door.

Chapter 14. Placing the rack-mounted system or expansion unit in the service position or operating position

Use these procedures to place a system or expansion unit into the service position or operating position to perform service or to gain access to internal components.

Placing the rack-mounted system or expansion unit in the service position

Use this procedure to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position.

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

DANGER

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

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

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

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

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

  (D005)

DANGER

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

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

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

CAUTION

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

(R001)

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

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

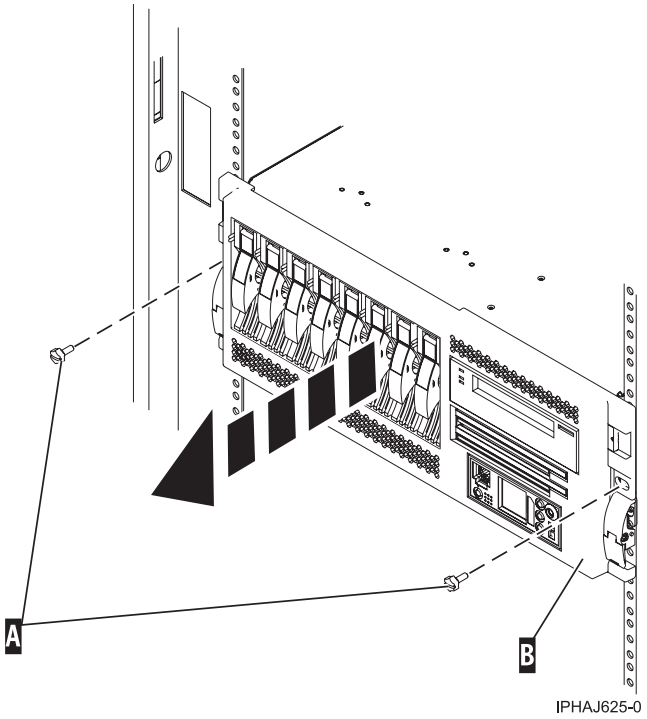


Figure 131. Removing the thumbscrews from the system and rack

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

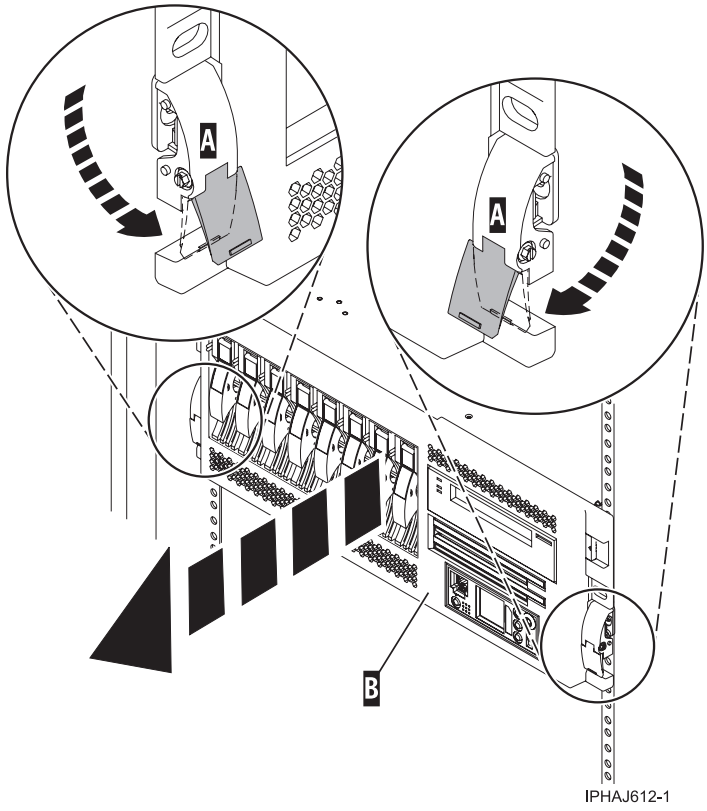


Figure 132. Releasing the rack latches

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

   Remember:

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

Placing the rack-mounted system or expansion unit in the operating position

Use this procedure to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

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

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

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

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

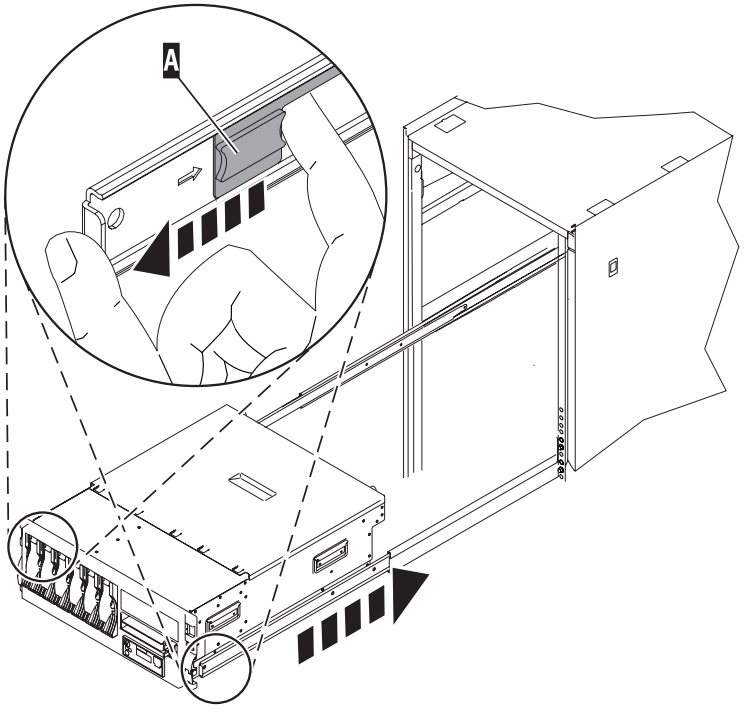


Figure 133. Releasing the rail safety latches

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

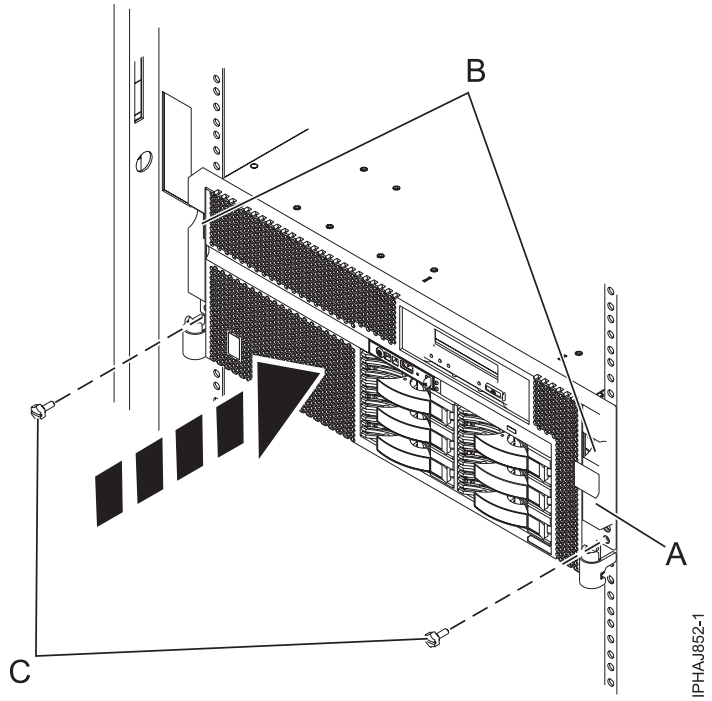


Figure 134. Pushing the system into the rack and attaching the thumbscrews

3. Close the front rack door.

Placing a rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50 in the service position

Use this procedure to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position.

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

DANGER

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

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

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

  To Disconnect:

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

  To Connect:

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

  (D005)

DANGER

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

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

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

CAUTION

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

(R001)

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

1. If necessary, open the front rack door.
2. Remove the two thumbscrews **(A)** that secure the system unit to the rack as shown in the following figure.
3. Release the rack latches **(B)** on both the left and right sides as shown in the following figure.

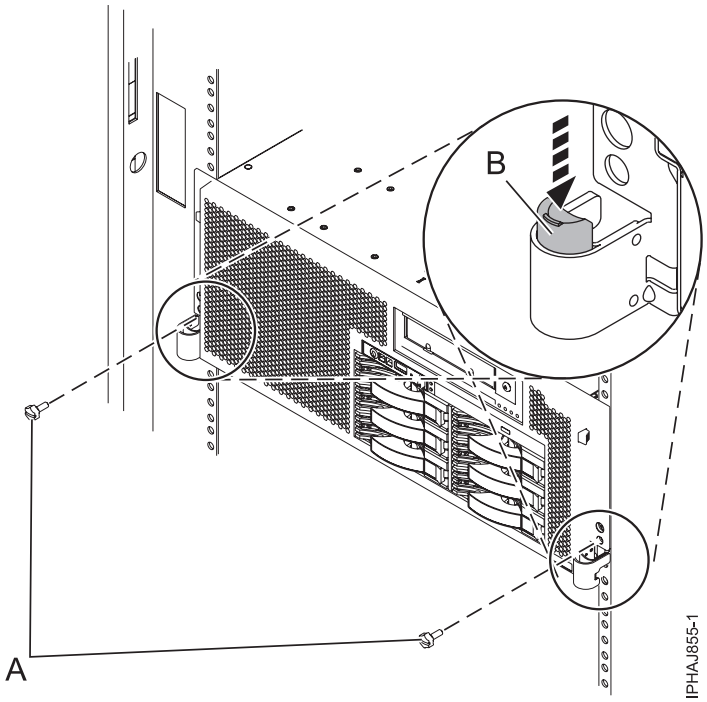


Figure 135. Releasing the rack latches

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

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

Placing the rack-mounted 8203-E4A, 8204-E8A, 9407-M15, 9408-M25, or 9409-M50 in the operating position

Use this procedure to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

To place the rack-mounted model into the operating position follow these steps:

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

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

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

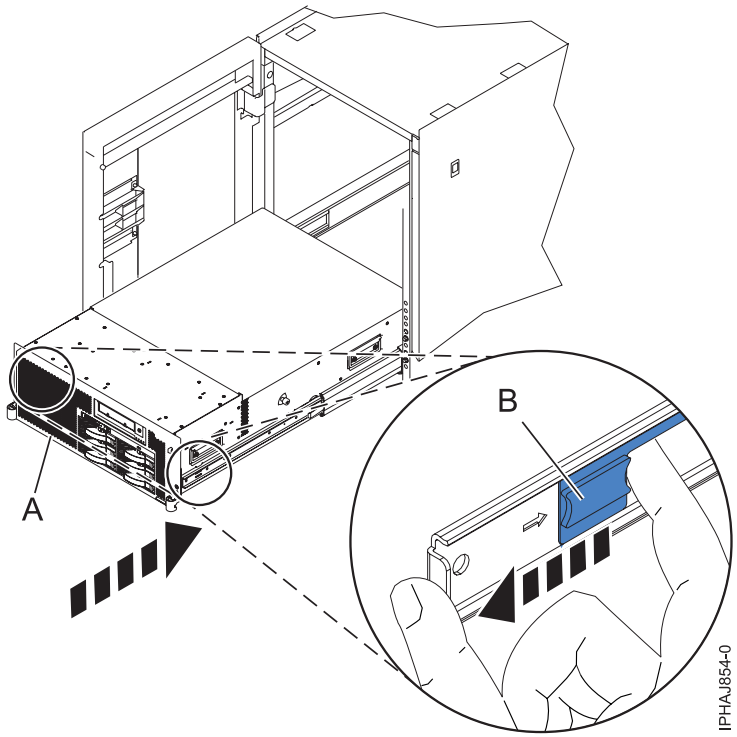


Figure 136. Releasing the rail safety latches

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

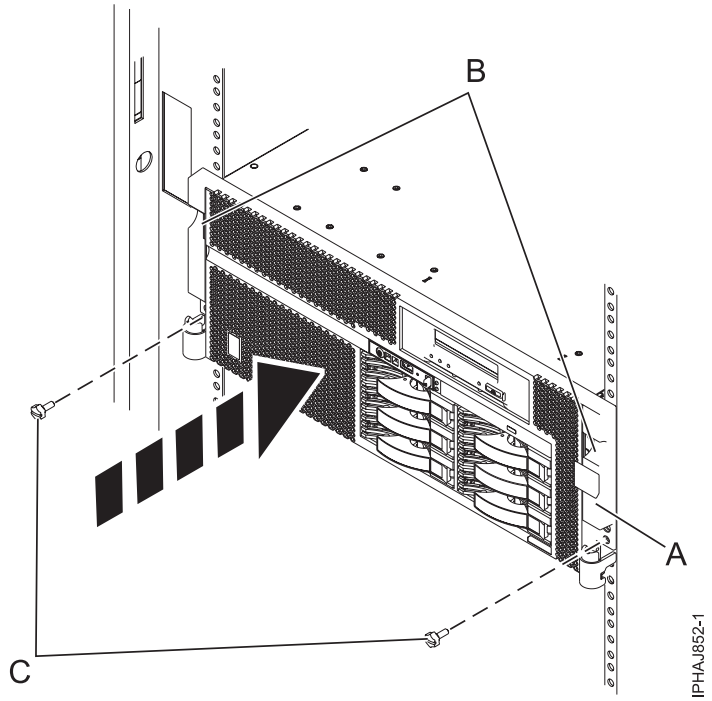


Figure 137. Replacing the thumbscrews

3. Close the front rack door.

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Electronic emission notices

Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER6 processor.

Federal Communications Commission (FCC) statement

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

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

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

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

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

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

VCCI Statement - Japan

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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

声　明

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

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

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

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

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

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자
또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는
구입하였을 때에는 가정용으로 교환하시기 바랍니다.

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

Germany Compliance Statement

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

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

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

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

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

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

Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

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

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