SA23-2744-01

7015

Model R00 Rack
Installation and Service Guide

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Installation and Service Guide

Second Edition (October 1995)

This edition notice applies to the *7015 Model R00 Rack Installation and Service Guide.*

Table of Contents

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying manuals.

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. Neither the provider nor the manufacturer are 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.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards not supplied by the manufacturer.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / 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.

Attention: 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.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Canadian Department of Communications Compliance Statement

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

電波障害自主規制　届出装置の記述

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。
従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。
取扱説明書に従って正しい取り扱いをしてください。

VCCI Statement

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

This equipment is in the Class 1 category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas.
Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.
Read the instructions for correct handling. VCCI–1.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese Klasse von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis:

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

Safety Notices

Note: For a translation of danger and caution notices, see the *System Unit Safety Information* manual, form number SA23-2652.

Definitions of Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. *Danger* notices are on the following pages:

2-13, 3-1520-1, 3-1530-1, 3-1550-1, 4-3, 4-7, 4-8, 4-11, 5-2, 5-5, 5-6, 5-9, 6-2, 7-1

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. *Caution* notices are on the following pages:

1-24, 2-11, 2-13, 3-1530-1, 4-3, 4-7, 4-8, 4-16, 4-18, 5-2, 5-5, 5-9, 6-2, 6-3, 6-4, 6-9, 6-10, 7-1, 7-15

An *attention* notice indicates an action that could cause damage to a program, device, system, or data.

Safety Notice for Installing or Servicing

For safety checks when installing or servicing a rack with standard features, refer to Chapter 4, "Removal and Replacement Procedures," and Chapter 6, "System Installation (AC Rack)." For safety checks when installing or servicing a -48 V dc rack, refer to Chapter 5, "Removal and Replacement Procedures and Chapter 7,"System Installation (-48 V dc Rack)."

Note: Before connecting or removing any cables to or from the system, be sure to follow the steps in the system installation procedures specified in the installation and service guide for your system or device.

Laser Safety Information

Note: The Optical Link Card (OLC) referred to in this information is part of the Serial Optic Channel Converter assembly.

This system contains a laser product called the Optical Link Card (OLC). In the U.S., the OLC is certified a Class 1 laser product that conforms to the requirements contained in the Department of Health and Human Services (DHHS) 21 CFR J. Internationally, the OLC is certified as a Class 1 laser product that conforms to the requirements contained in the International Electrotechnical Commission (IEC) standard 825 (1984), the Verband Deutscher Elektrotechniker (VDE) standard 0837 (1986), and the CENELEC (European Committee for Electrotechnical Standardization) Harmonization Document HD 482 S1 (1988). The German testing institute VDE assigned a certificate of conformity to DIN IEC 825/VDE 0837/02.86 and CENELEC HD 482 S1/03.88; the certificate registration number is 3642.

In addition, Statens Provningsanstalt (Swedish National Testing Institute) tested and approved the OLC for use in Sweden as a Class 1 laser product and assigned the approval number SP LA 89:184. The CDRH certification label and the VDE certificate of conformity mark are located on the plastic retainer of the OLC product. Figure 1 shows the system Class 1 information label required by IEC 825.

Class 1 laser products are not considered to be hazardous. The OLC internally contains a gallium aluminum arsenide (GaAlAs) semiconductor laser diode emitting in the wavelength range of 770 to 800 nanometers. This laser diode is a Class 3B laser that is rated at 5.0 milliwatts. The design of the OLC is such that access to laser radiation above a Class 1 level during operation, user maintenance, or service conditions is prevented.

Figure 1. Class 1 System Information Label Required by the IEC 825 Standard

The Optical Link Card (OLC) must only be connected to another OLC or a compatible approved laser product. Any compatible laser product must contain the open fiber link detection and laser control safety system used in the OLC. This is a requirement for correct operation of the optical link. In addition, the OLC product is designed and certified for use in applications with point-to-point optical links only. Using this product in any other type of optical link configuration (for example, links containing optical splitters or star couplers) is considered as not using the product correctly and may require that the user certify the laser product again for conformance to the laser safety regulations.

About This Book

How to Use This Book

Note: This book uses three-digit model numbers. You may have other documentation that uses four-digit model numbers. For example, the model 95E in this book may be referred to as a model 950H in other documentation. They are the same system units.

This book contains maintenance information that is specific to the 7015 system. It also contains maintenance analysis procedures (MAPs) that are not common to other systems.

MAPs that are common to all systems are contained in the *POWERstation and POWERserver Common Diagnostics Information Manual.*

This book is used by the service representative to repair system failures. This book assumes that the service representative has had training on the 7015 system.

Related Publications

The *POWERstation and POWERserver Common Diagnostics Information Manual*, form number SA23-2765, contains reference information about adapters and devices, checkout procedures for problem determination, system verification by using the diagnostics, and cabling for the system units. This manual also contains the removal and replacement procedures for the logic boards on the disk drives and cabling information that can be used to isolate problems with customer cabling.

The *7015 Model R30 CPU Enclosure Installation and Service Guide,* form number SA23-2743, provides maintenance information for the 7015 Model R30 CPU enclosure.

The *7015 Model R30 CPU Enclosure Operator Guide,* form number SA23-2742, provides information about the controls and features of the 7015 Model R30 CPU enclosure.

The *7015 POWERserver Async Expansion Drawer Service Guide*, form number SA23-2651, provides maintenance information for the async drawer.

The *7015 POWERserver SCSI Drawers Installation and Service Guide*, form number SY33-0160, provides maintenance information for the SCSI drawer.

The *9348 Service Information* manual, form number SY31-0697 provides maintenance information for the 9348 tape unit.

The *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Operator Guide,* form number GA33-3208, contains information about operator controls and features for the serial-link expansion drawer.

The *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*, form number SY33-0161, contains maintenance information for the serial-link drawer.

The *9334 SCSI Expansion Units Operator Guide*, form number GA33-3232, provides information about the operator controls and features on the SCSI expansion drawer.

The *9334 Models 010 and 011 SCSI Expansion Units Installation and Service Guide,* form number SY33-0165, contains maintenance information for the SCSI drawer.

The *System Unit Safety Information* manual, form number SA23-2652, contains translations of danger and caution notices.

The *7135 RAIDiant Array: Operator Guide*, form number GA33-3251, provides information about operator controls and features on the SCSI disk box.

The *7135 RAIDiant Array: Installation and Service Guide*, form number SY33-0181, contains information on the SCSI disk box.

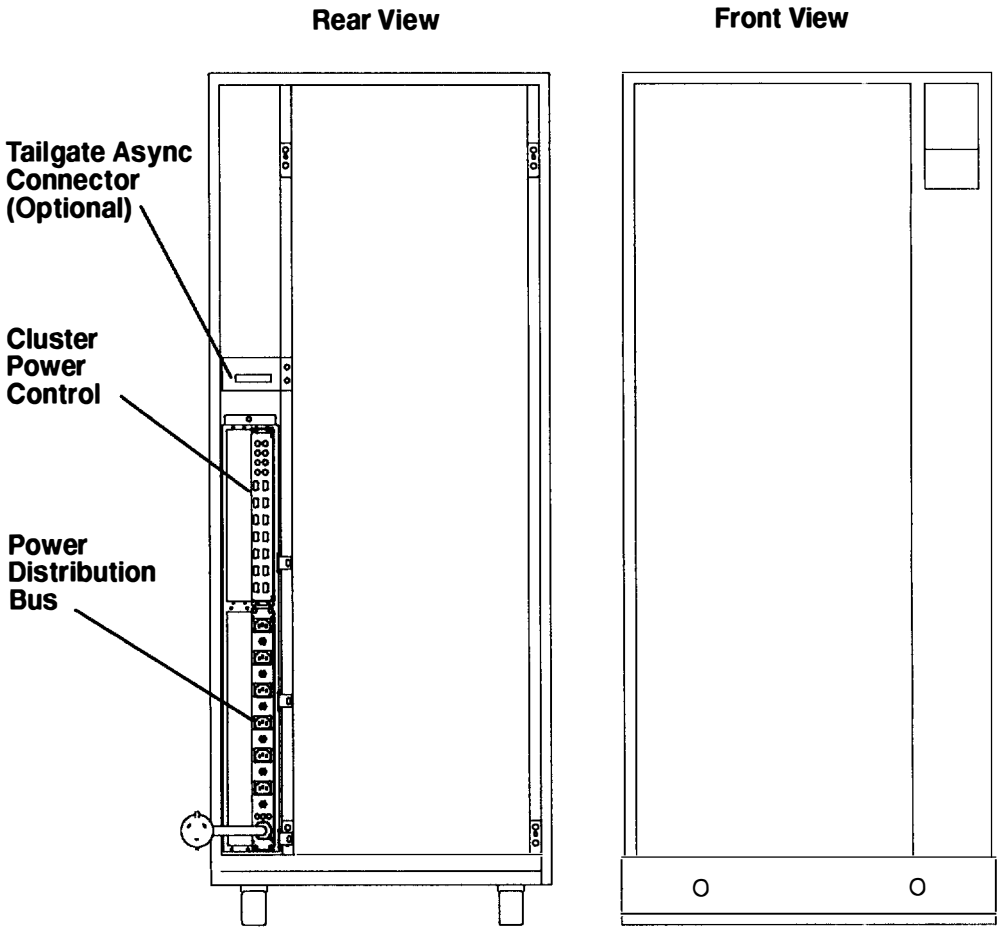
The *Cluster Power Control Operator and Service Guide*, form number SA23–2766, contains information that is specific to the Cluster Power Control.

Chapter 1. Reference Information (AC Rack)

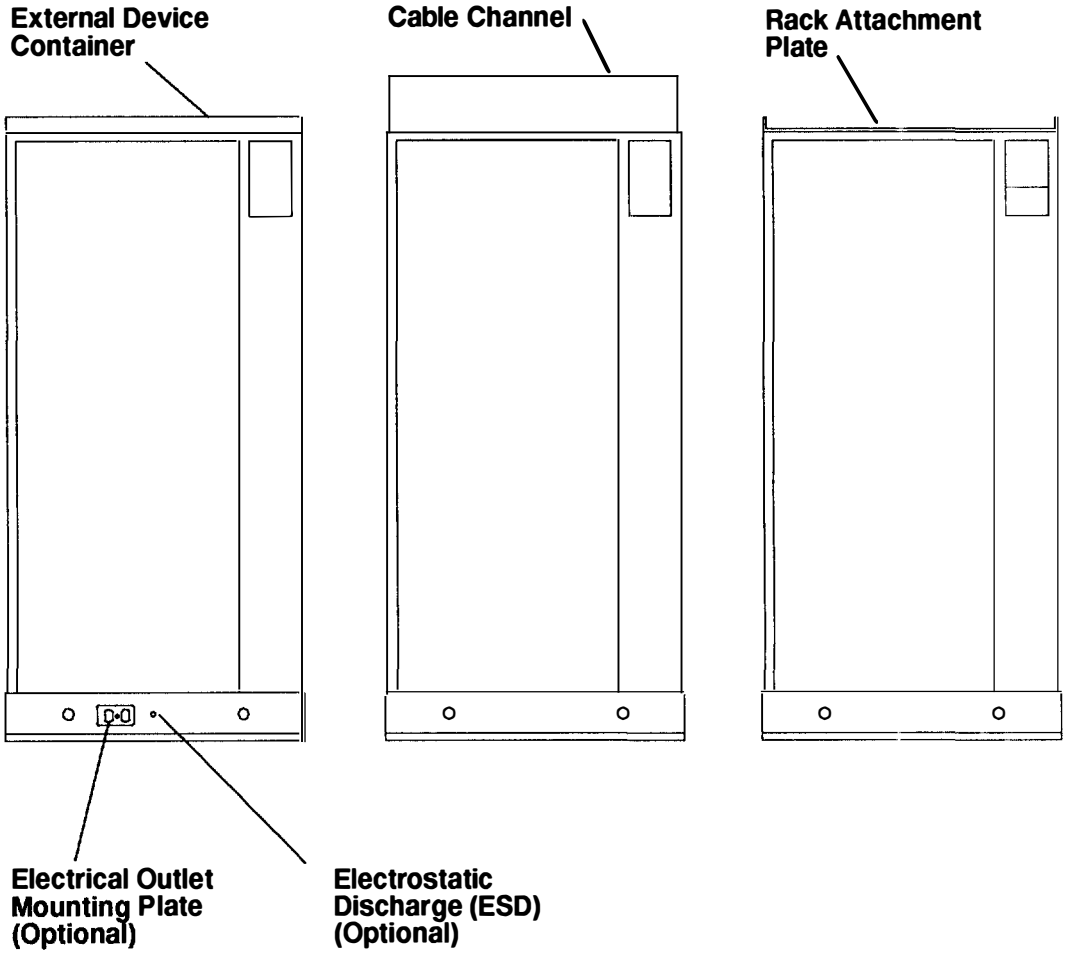
This chapter contains information about an 7015 Model R00 rack. Included in this chapter are locations of rack features, drawers, connectors, parts, and devices; data flow and power control; and rack specifications.

For information about a -48 V dc rack, refer to Chapter 2.

7015 Model R00 Rack



Optional Rack Features for AC Rack



Power Distribution Systems

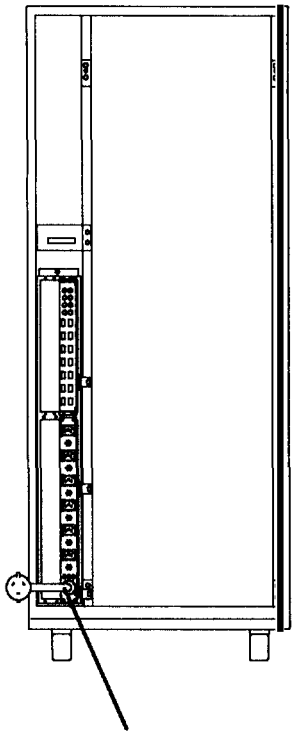
This section describes power components and how power is controlled in the 7015 system.

The power distribution system in an AC 7015 Model R00 rack can contain either a power distribution bus (PDB) or a power distribution unit (PDU).

An AC rack containing a PDU can also contain an optional battery backup unit (BBU). In addition to supporting other types of drawers in a rack, the BBU can support only one CPU-type drawer in a rack.

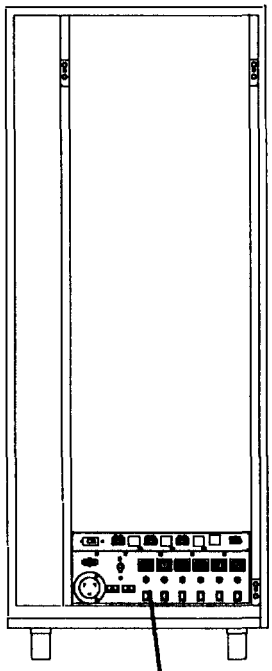
The power distribution system in a DC 7015 Model R00 rack can contain only a power distribution panel (PDP). For information about the PDP, refer to Chapter 2.

Rear View of AC Rack with Power Distribution Bus



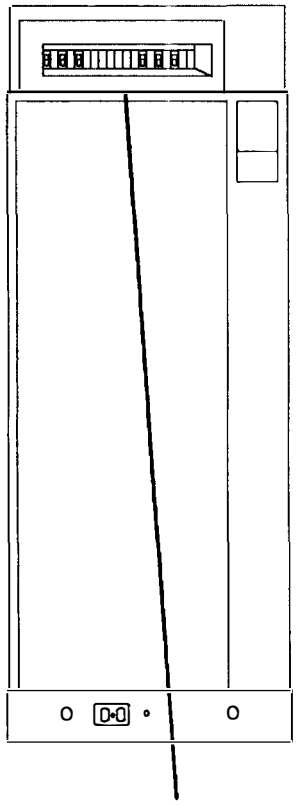
Power Distribution Bus

Rear View of AC Rack with Power Distribution Unit



Power Distribution Unit

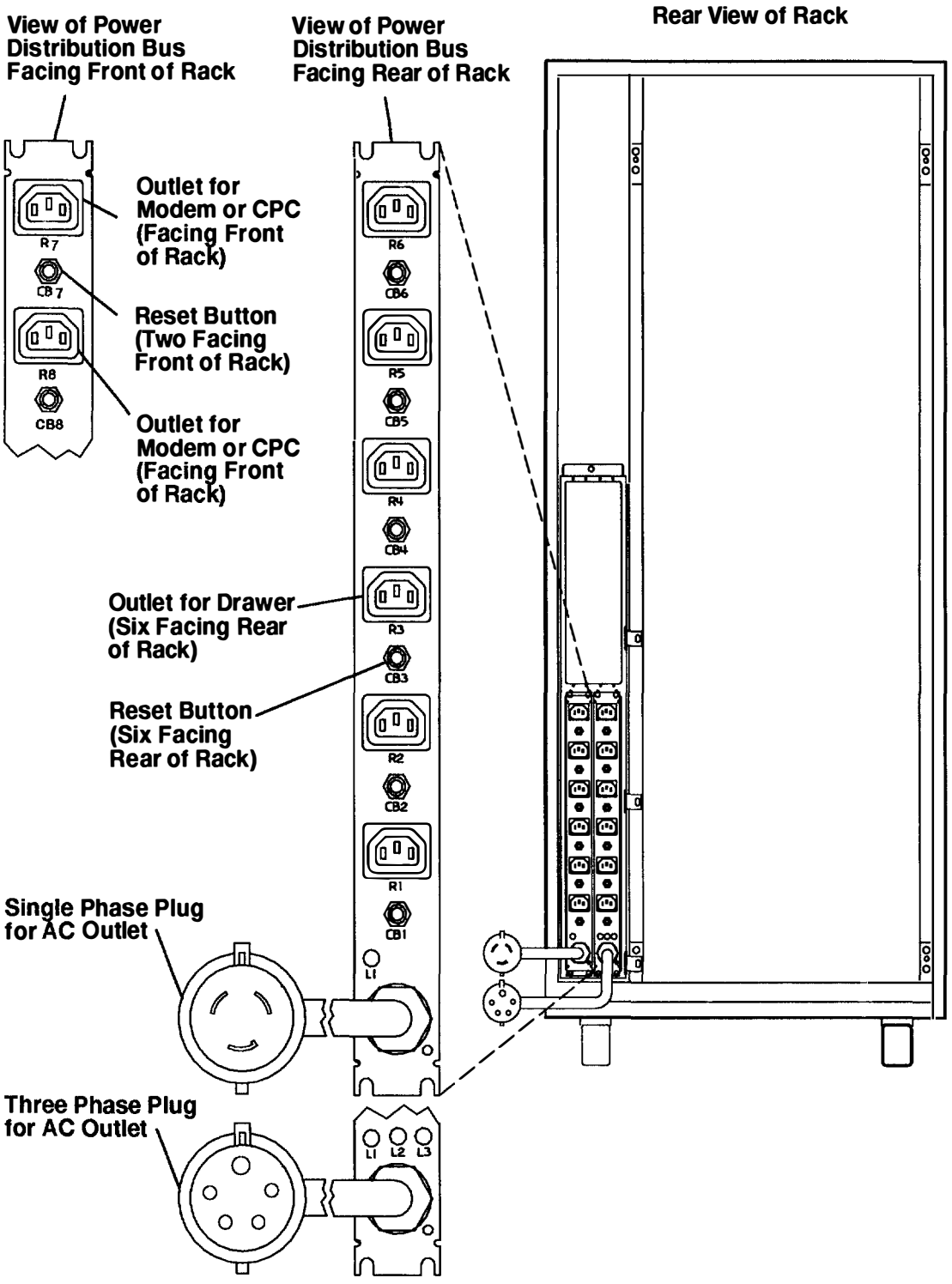
Front View of DC Rack with Power Distribution Panel (Described in Chapter 2)



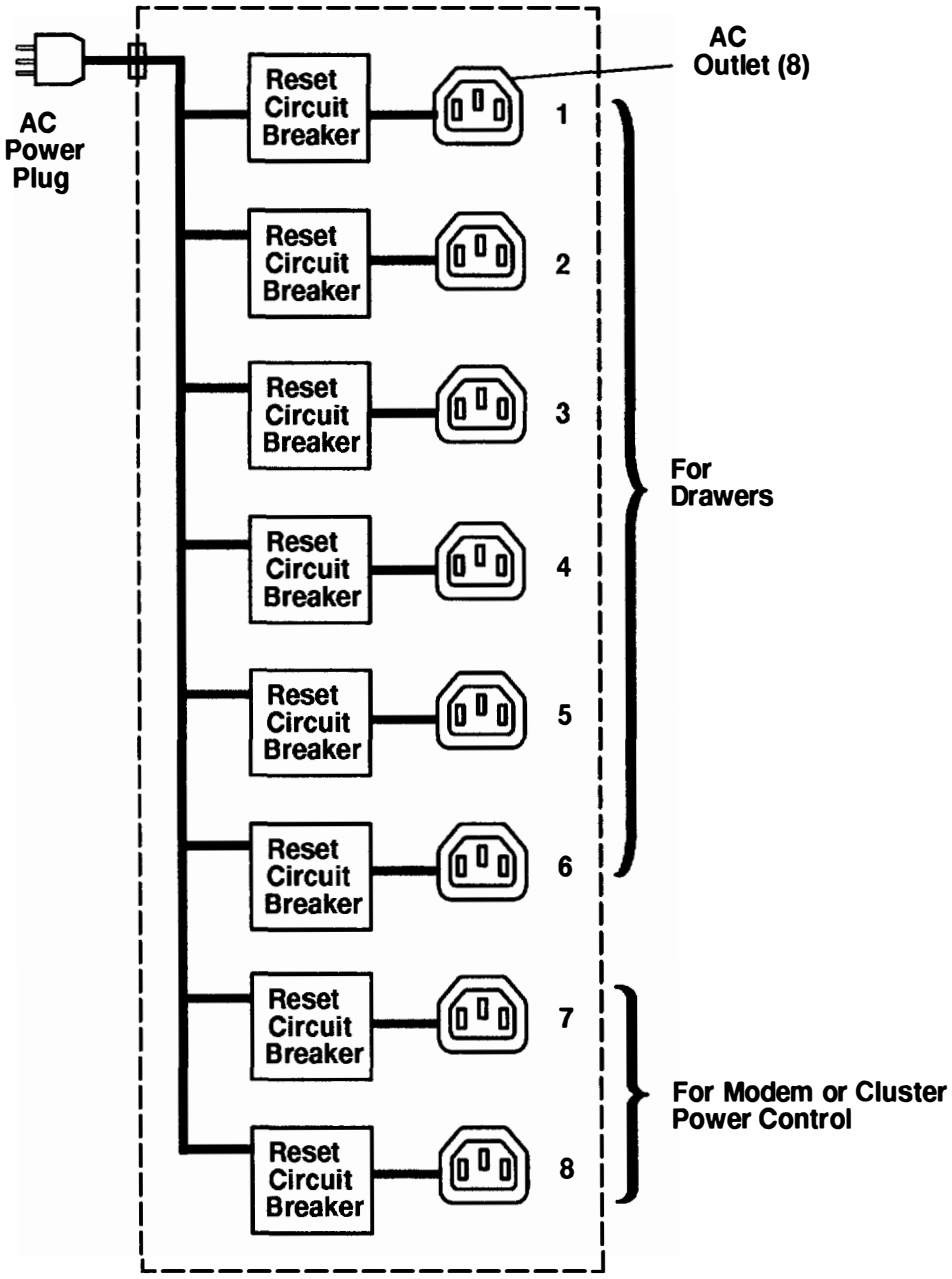
Power Distribution Panel

Power Distribution Bus

The power distribution bus (PDB) can be installed in a 7015 Model R00 rack. The 7015 Model R00 rack can contain two PDBs. The PDB contains six 200 to 240 V ac outlets for providing power to all the drawers in the rack and two outlets for connecting a modem and cluster power control (CPC). Each outlet is connected to a separate circuit breaker for protection against excessive currents. A battery backup unit is not compatible with a PDB and cannot be connected to a PDB.



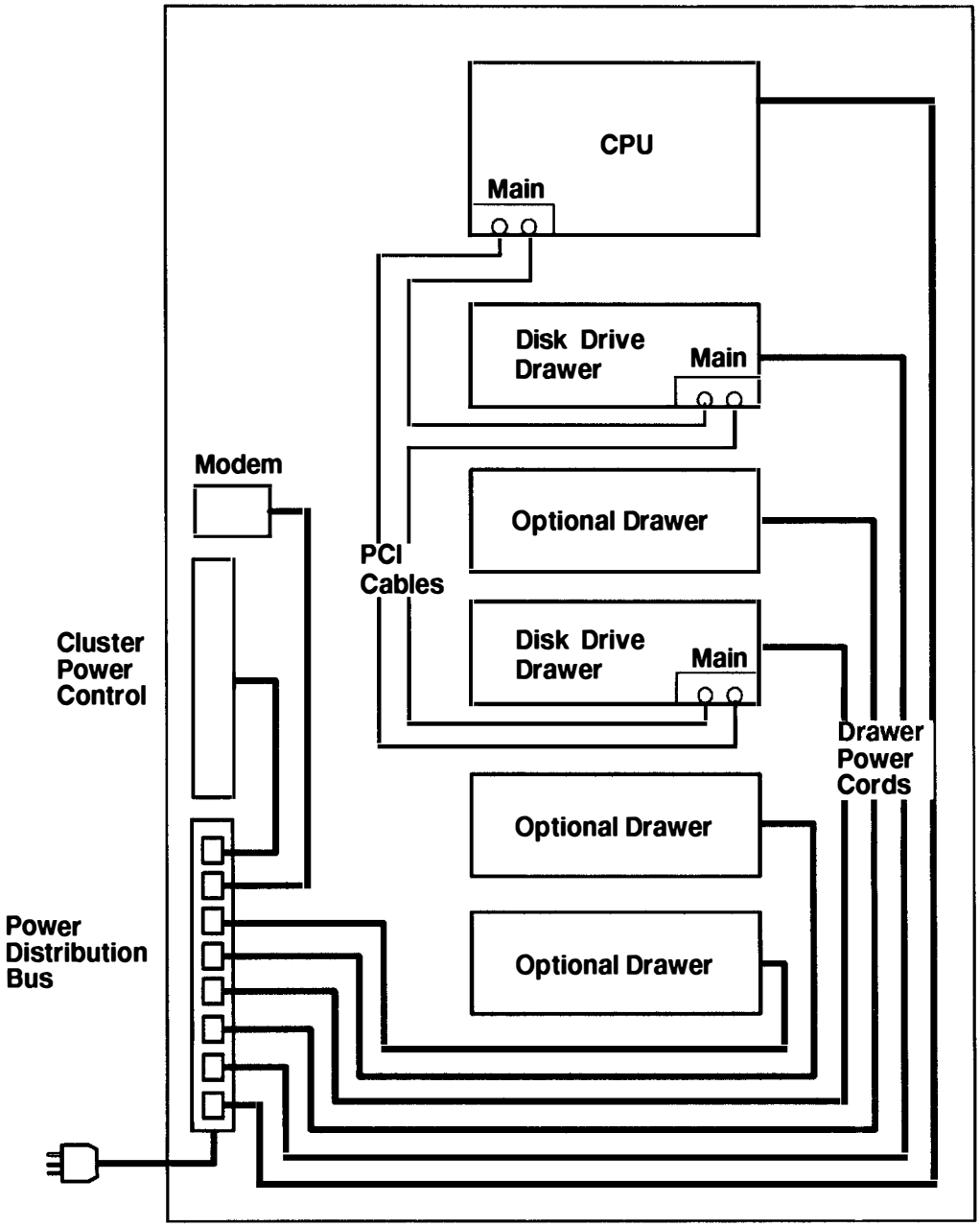
Power Distribution with the Power Distribution Bus



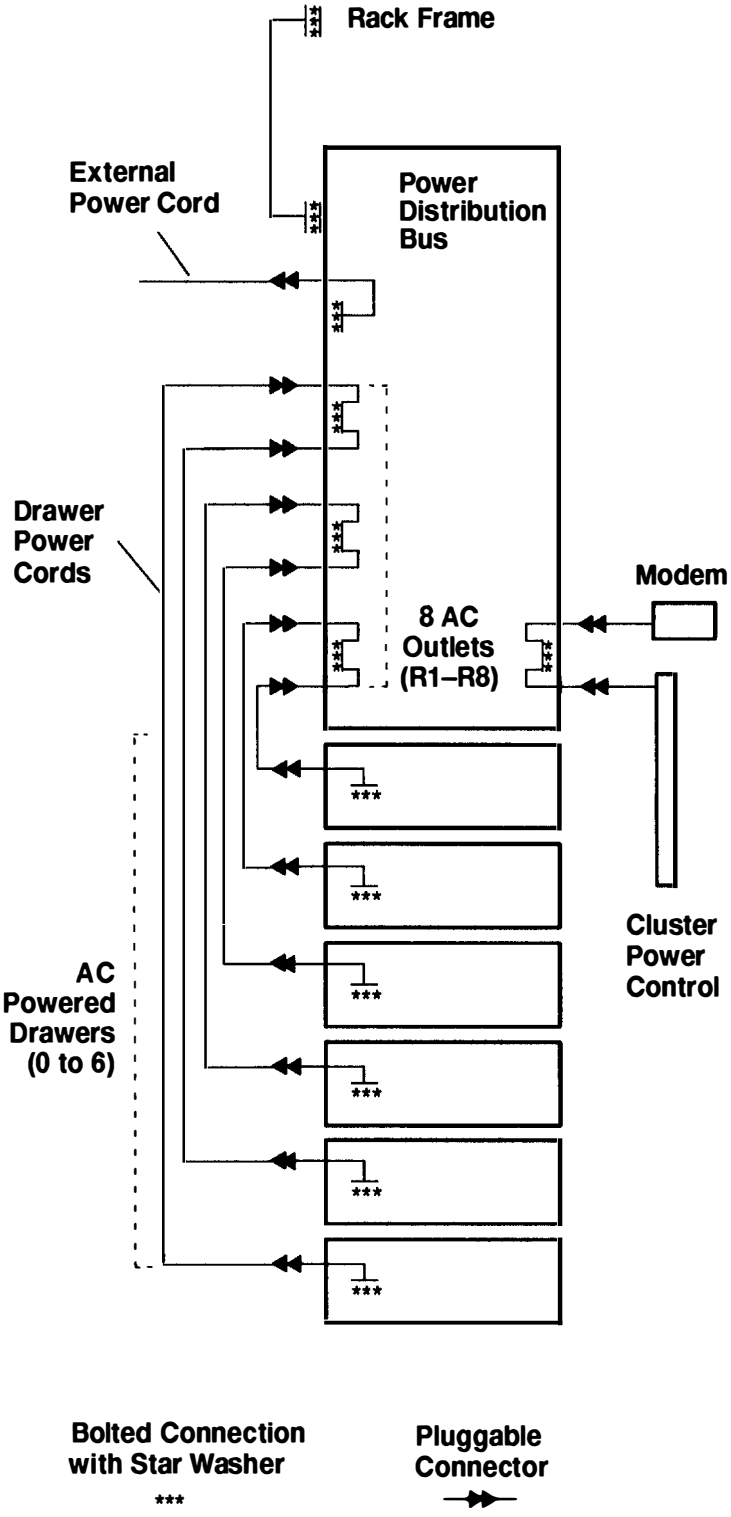
Power Control with Power Distribution Bus

The power distribution bus (PDB) receives power from an AC wall outlet, and then provides power to the drawers in the rack through eight outlets contained in the PDB. Any of the six outlets can be used to provide power to drawers installed in other racks. The two outlets facing the front of the rack are provided for connecting the modem and cluster power control (CPC). The PDB is not part of the power control interface (PCI) and does not use PCI cables. However, the PDB can be used in a rack with a PCI system.

Power Control Diagram for Power Distribution Bus



Grounding Diagram – Power Distribution Bus



Cluster Power Control

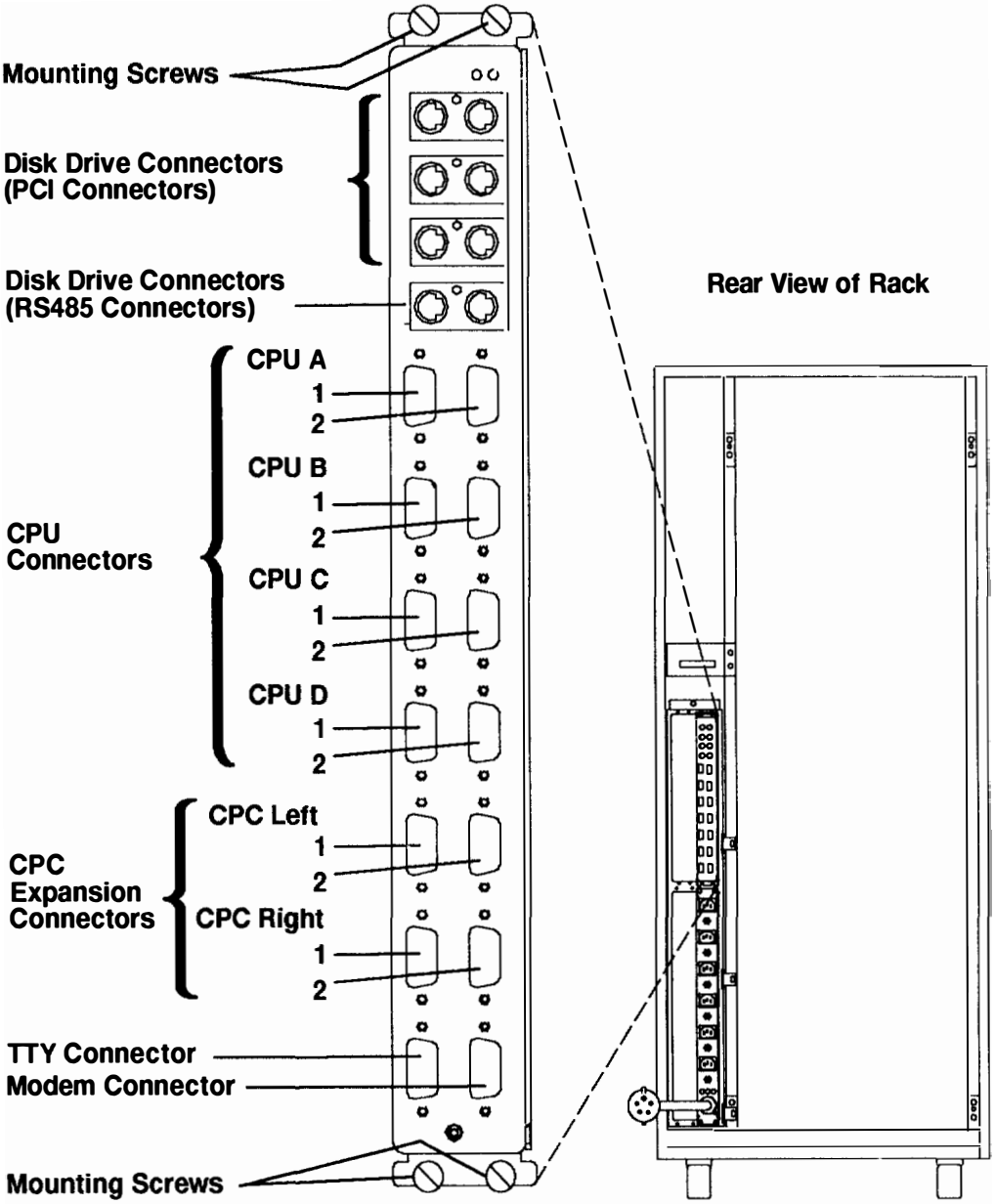
The cluster power controller (CPC) provides:

- Connectivity between the remote support facility and multiple CPUs through the modem
- Connectivity from any attached CPU to any attached disk drive drawer
- Central power-on and power-off through the TTY.

The CPC provides ports for connection of multiple G Series system units, J Series system units, and Model R30 CPU enclosures for power control interface connection of CPUs and disk drive drawers. The CPC also contains ports for connection of a modem and TTY.

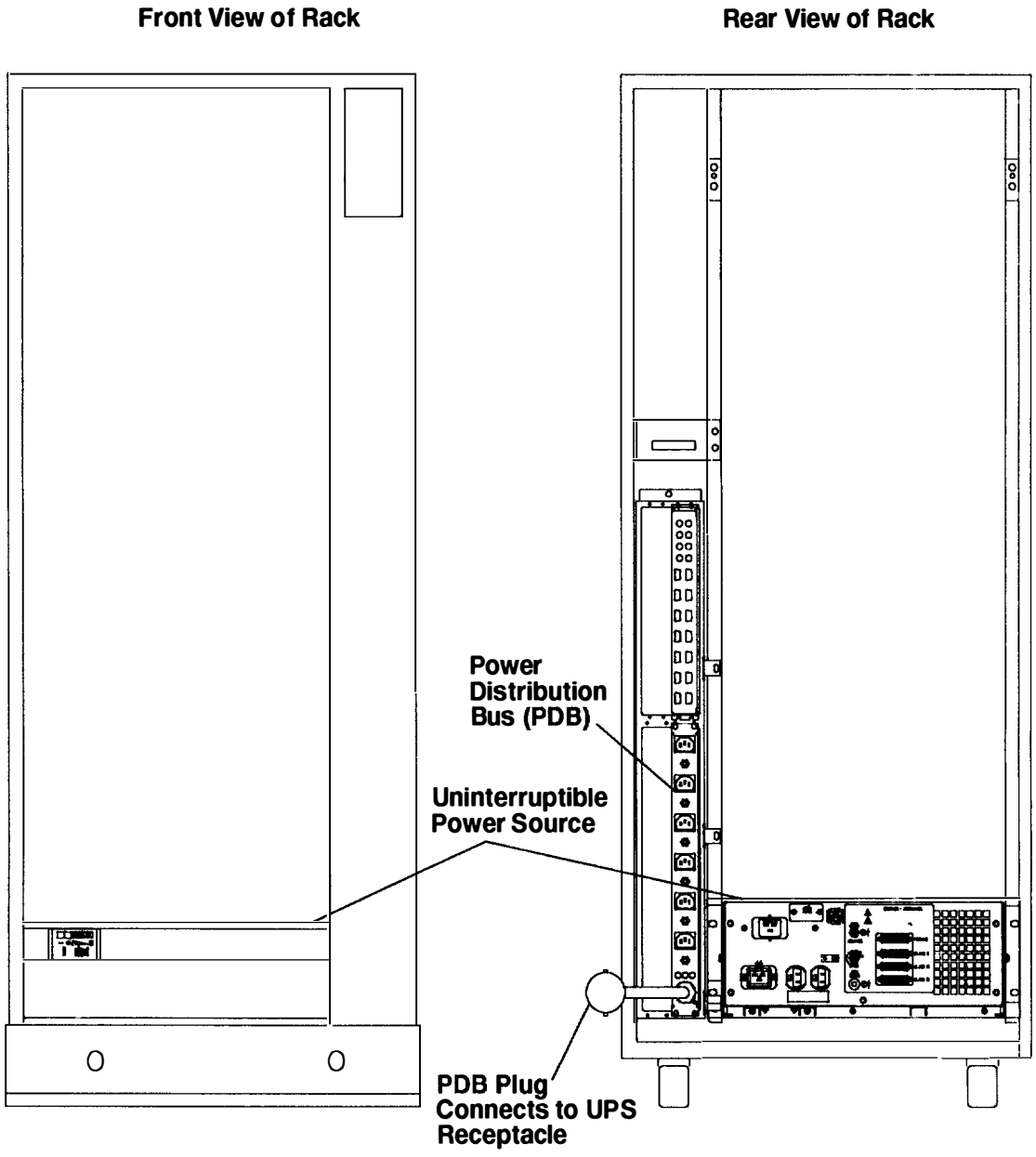
The AC 7015 Model R00 rack can contain two CPCs.

For more information about the CPC, refer to the *Cluster Power Control Operator and Service Guide*, form number SA23–2766.

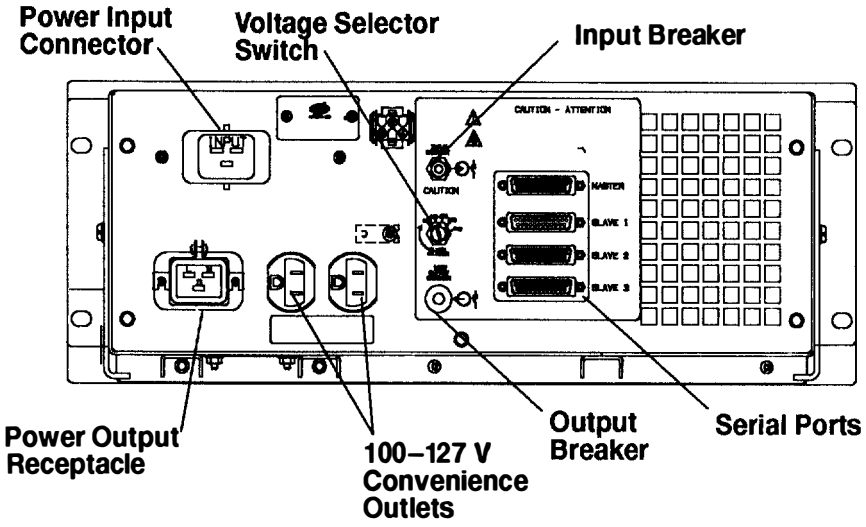


Uninterruptible Power Source

The uninterruptible power source (UPS) can be installed in a 7015 Model R00 rack. The UPS contains one power plug (in) and one power outlet (out) for connecting to the power distribution bus (PDB).



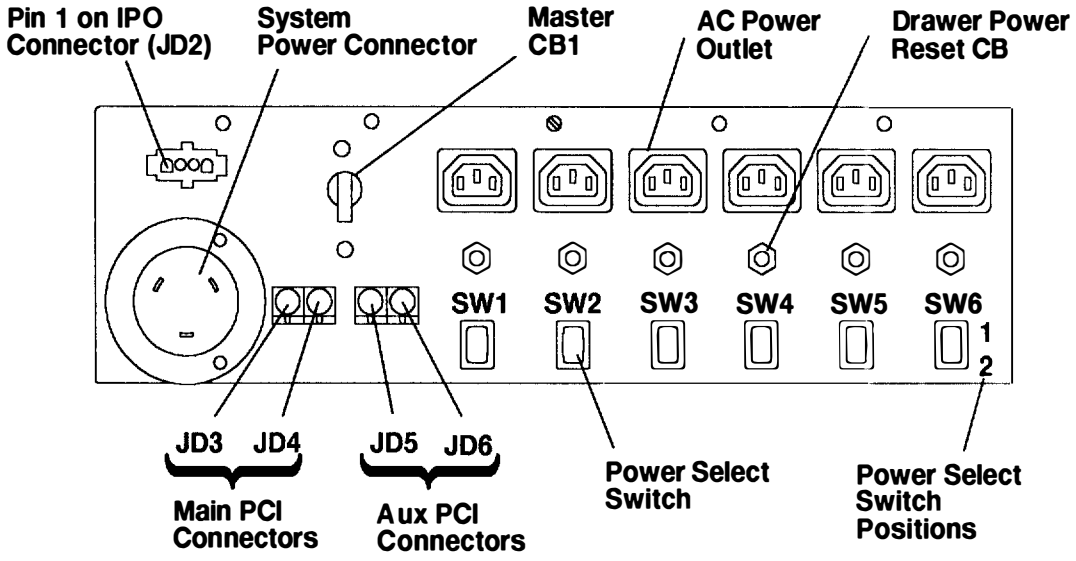
Uninterruptible Power Source from Rear



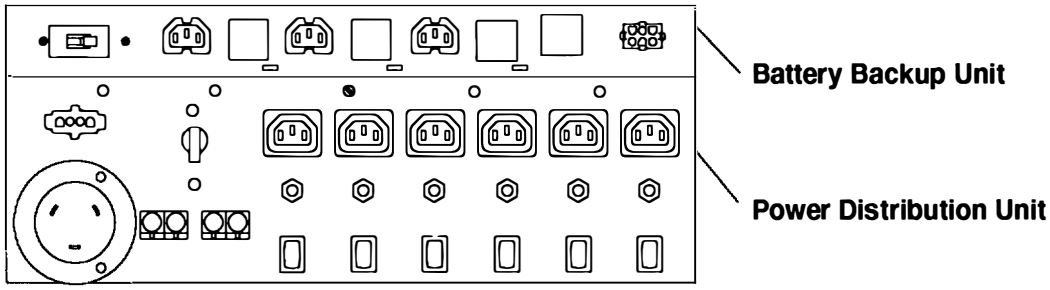
Power Distribution Unit

The power distribution unit (PDU) provides a circuit breaker (Master CB1) that protects the line cord and its connectors from excessive currents, and functions as an AC power disconnect during servicing. The immediate power-off (IPO) switch on the front of the rack is connected by a cable to the power distribution unit and provides an alternate method of disconnecting all power to the rack. Six 200 to 240 V ac outlets on the power distribution unit furnish AC power to the drawers in the system unit. A power select switch located beneath each AC power outlet allows individual outlets to be either always on or switched on and off by the power control interface (PCI) signal. A connector is provided on the unit to attach the battery backup unit.

Rear View of Power Distribution Unit



Power Distribution Unit with Battery Backup Unit Attached



Battery Backup Unit

Note: The battery backup unit (BBU) is optional and can be installed when a power distribution unit is installed in a 7015 Model R00 rack. The BBU can support only one CPU in a rack.

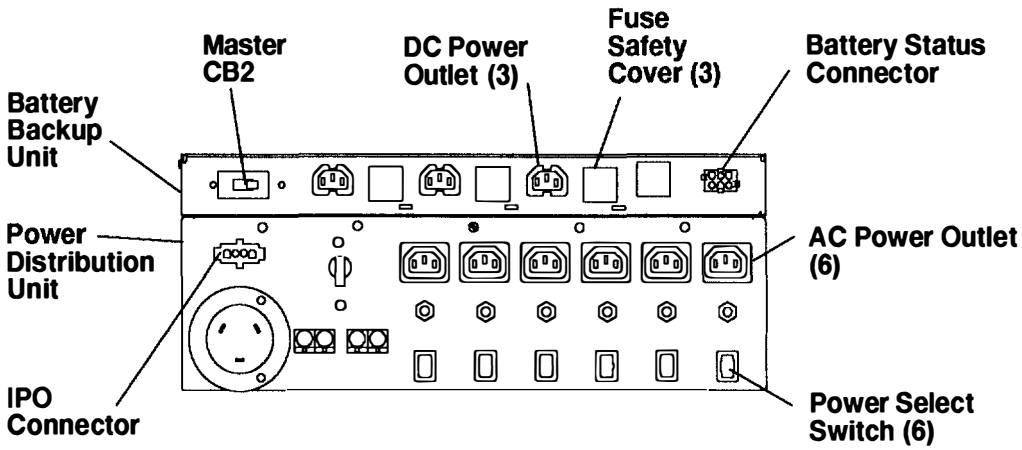
The battery backup unit (BBU) provides power to operate three drawers in the 7015 Model R00 rack during short power outages, and it provides time for an orderly system shutdown during long power outages. You can attach up to three additional drawers to the battery backup unit by using the battery backup extender cables.

Note: Power to a terminal that controls the system can be interrupted during power outages unless the terminal is connected to an uninterruptible power source.

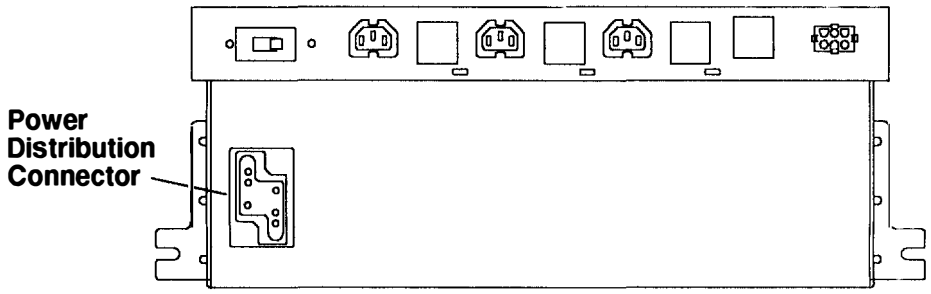
The BBU is physically and electrically attached to the power distribution unit and provides two modes of operation. In normal mode, the BBU receives 240 V ac from the power distribution unit, and the converter circuitry provides 300 V dc (nominal) to three receptacles located on the back of the BBU and 1 ampere (nominal) charging current to the batteries. In the backup mode, four batteries provide 48 V dc (nominal), which is converted to 300 V dc. The BBU can provide power for a combined load of 1500 watts for a minimum of 10 minutes.

Drawers that can accept the keyed DC power cords can receive power from the BBU instead of the power distribution unit. If AC power fails, the DC-to-DC converter in the BBU maintains DC outputs. The BBU can maintain system operation during an AC power outage, but it cannot be used to power on the system when AC power is not present.

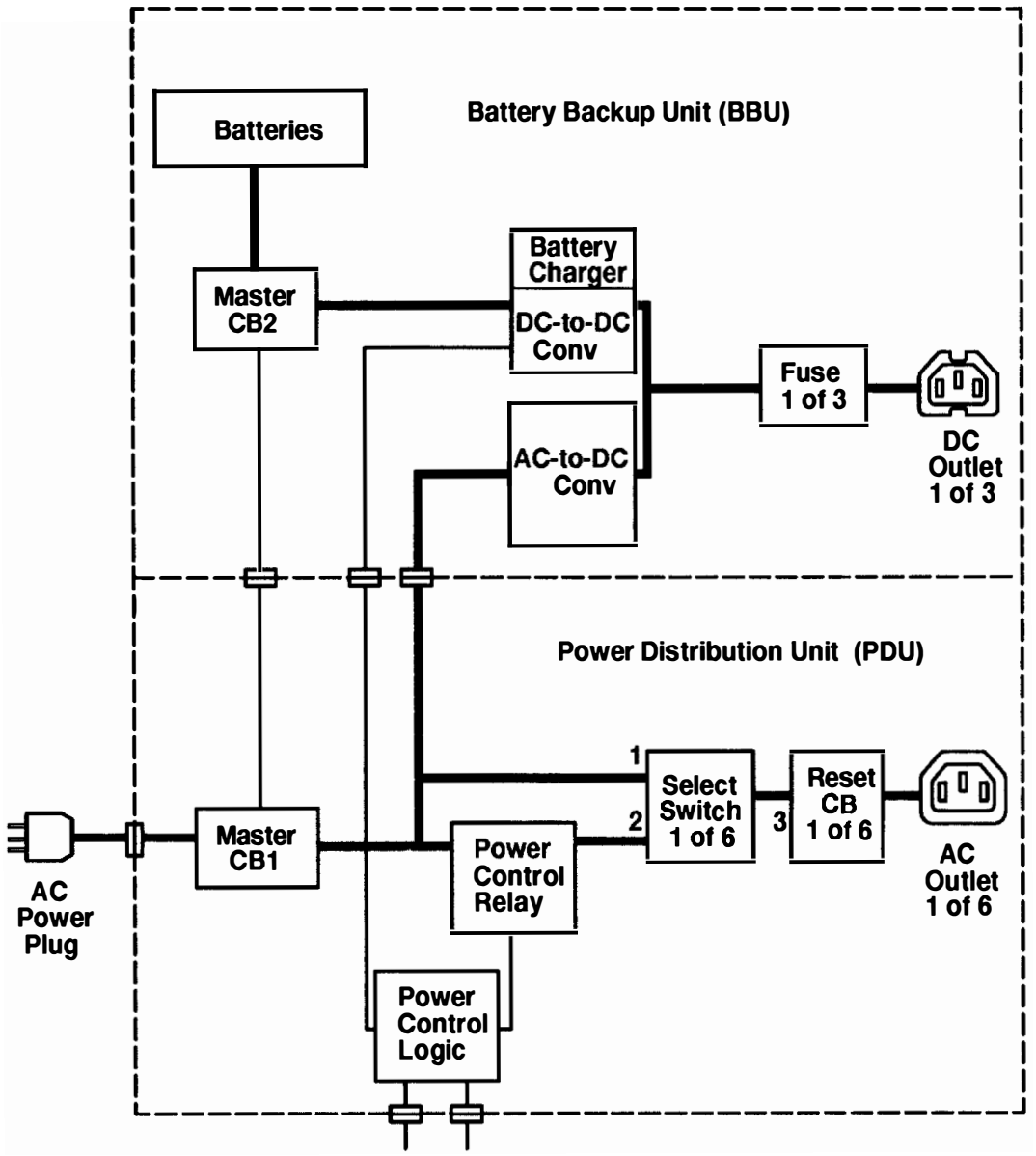
Rear View of Battery Backup Unit



Rear View of Battery Backup Unit



Power Distribution with the PDU and BBU



Power Control with Power Distribution Unit

Note: The PDU supplies power to the drawer. Additionally, if a drawer has a power control interface (PCI) connector, the PCI signal can control, within the drawer, the power supplied by the PDU.

The CPU is the source of the power control interface (PCI) signal that sets the status of power for all connected drawers. The CPU receives input signals from the operator panel, internal clock, EIA-232 interface, and battery backup unit. Depending on the signal received, power is either set to on or off for all drawers controlled by the PCI signal. The PCI signal is connected to the drawers by power control signal cables attached to the main PCI connectors on the rear of each drawer. The main PCI connectors on the 7015 CPU are output only; however, on other drawers, one of the main PCI connectors is common input and the remaining connector is an output that can supply the PCI signal to additional drawers.

Aux (auxiliary) PCI connectors are located on the rear of some drawers. Power to these drawers can be controlled from two different CPUs when a main PCI connector on the drawer is connected to one CPU and an auxiliary connector on the drawer is connected to another CPU. When PCI cables are connected to a drawer in this way, the drawer receives power when either CPU is on or when both CPUs are on. This configuration can be used to connect a drawer that is shared by two system units.

Power within the drawers in the system unit and the expansion rack can be controlled in one of the following ways:

Note: If your system is configured as follows:

- Each rack or expansion rack has a separate power source to ensure constant available power.
- The disk drive drawers are shared between CPUs in more than one rack.

It is recommended that all power control interface (PCI) cables be disconnected. This configuration is sometimes called high availability.

- Drawers with PCI connectors:

  Power within drawers with PCI connectors, such as the SCSI drawer, can be controlled by the PCI signal from the CPU; these drawers receive power from either the BBU or the PDU. The PDU contains six power outlets each having a power select switch that controls power from the PDU; when using PCI connectors, set the power select switch for a drawer power outlet on the PDU to 1 (always on).

  Depending on your rack configuration, one end of the PCI cable must be connected to either the main PCI connectors or the auxiliary PCI connectors on the PDU, and the other end must be connected to the drawer or CPU.

  When only the main PCI connector (on the PDU) is connected to the CPU, power to other drawers using PCI connectors is controlled by the CPU. When the main PCI connector is connected to a CPU and the auxiliary PCI connector (on the PDU) is connected to a different CPU, the drawer is powered on when either CPU is powered on and is powered off only when both CPUs are powered off.

- Optional drawers without PCI connectors:

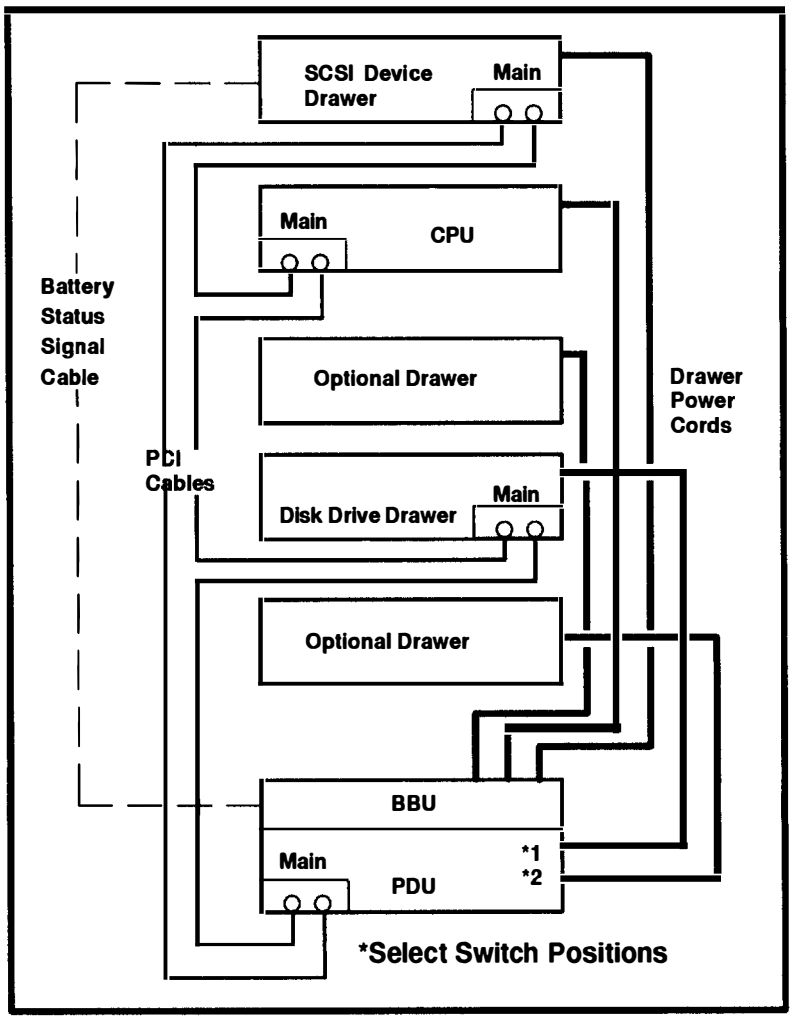
  If the system has a horizontally mounted PDU,

  – then the power select switch for the outlet on the PDU used by the drawer can be set to "2" (switched) so that the CPU will control the power to the drawer, or

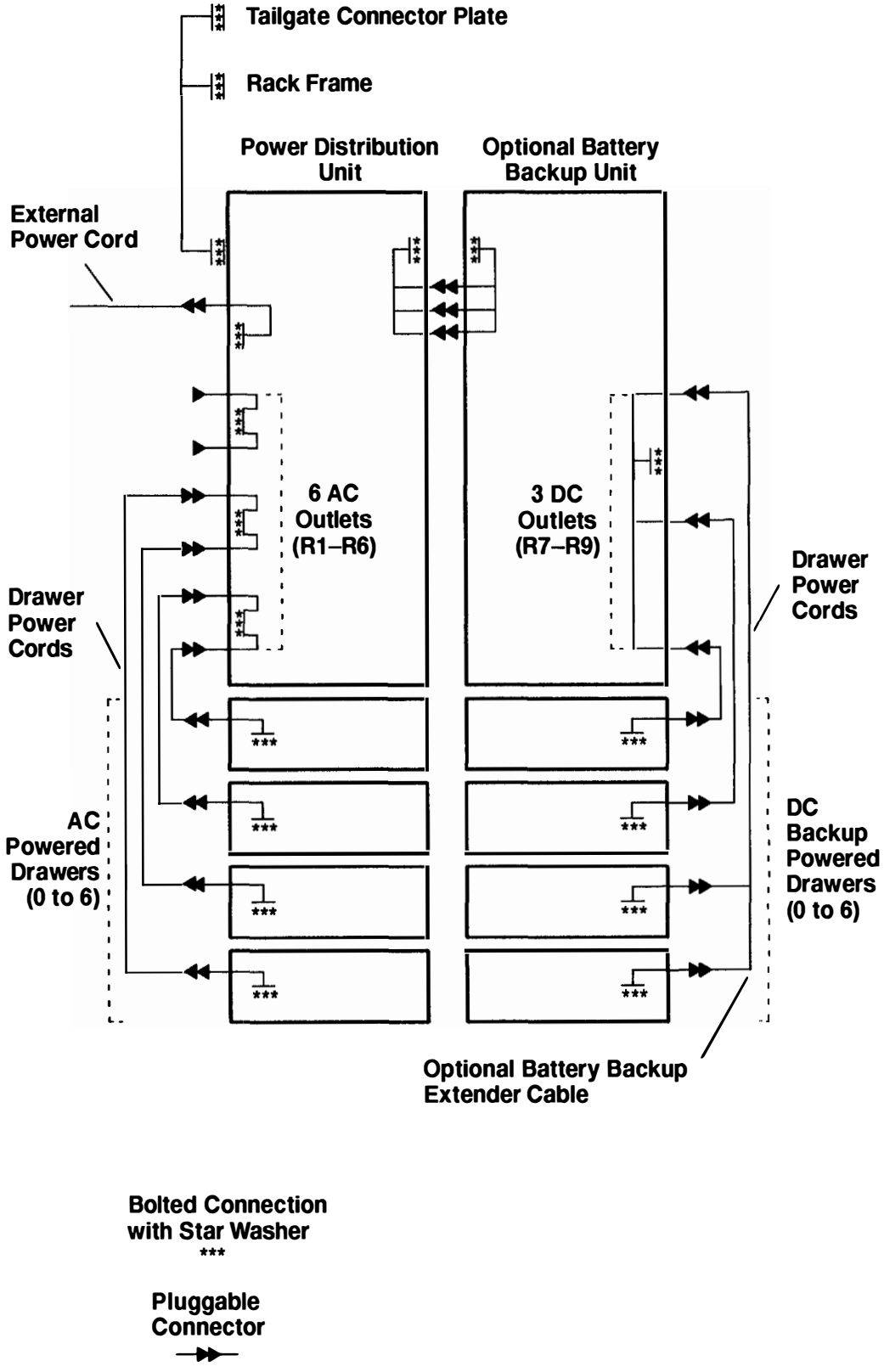
  – the power select switch for the outlet on the PDU used by the drawer can be set to "1" (unswitched) so that the drawer has power whenever the master circuit breaker on the PDU is on.

  If the system has a vertically mounted PDB, then the power to the drawer will be on whenever the customer source at the wall is on.

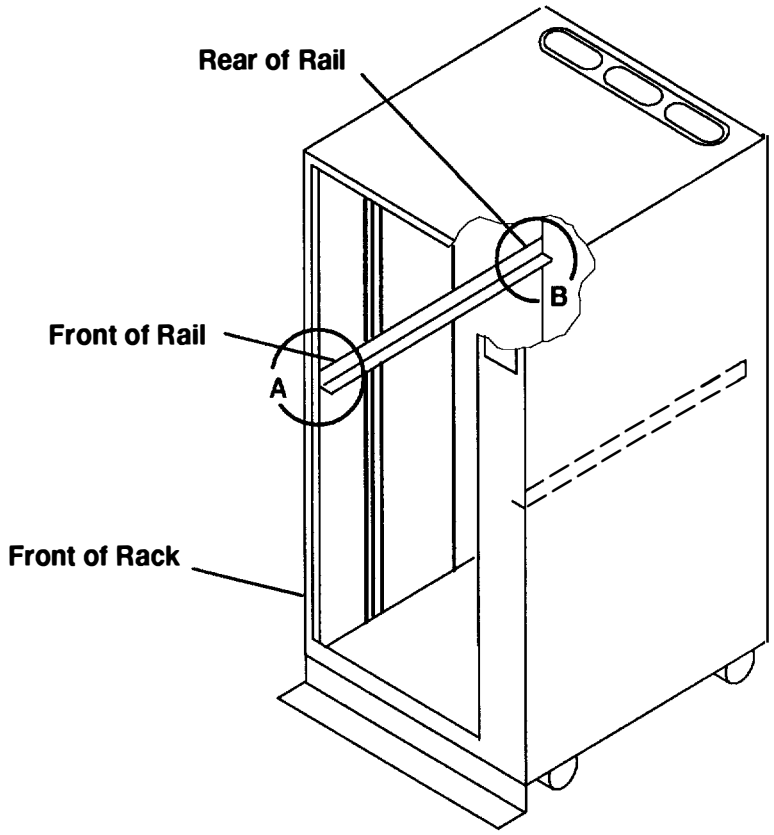
Power Control Diagram with Power Distribution Unit



Grounding Diagram – Power Distribution Unit and Battery Backup Unit

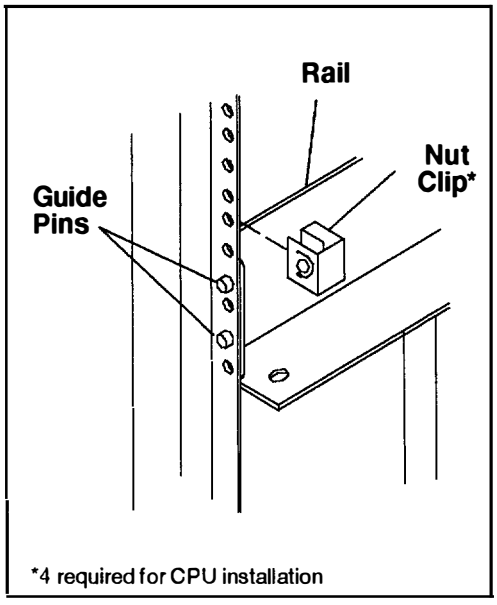


Typical Rail Installation

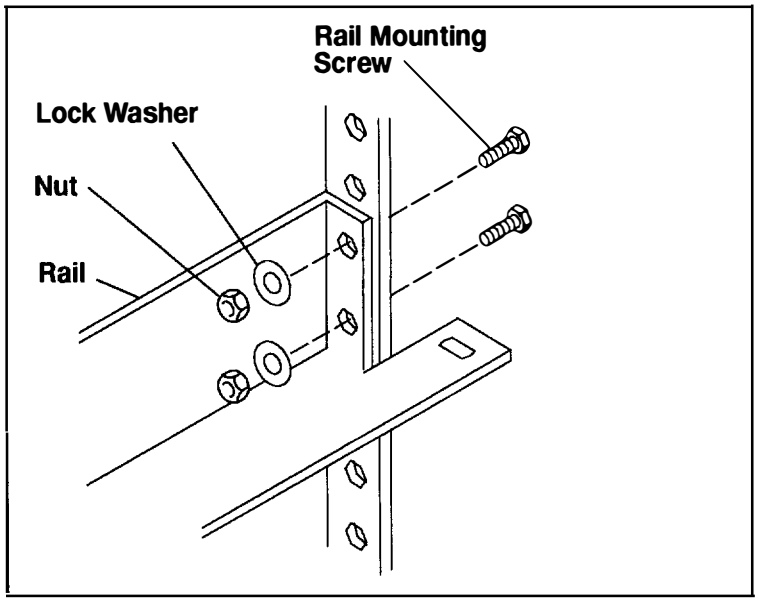


Mounting Hardware For CPU Enclosure

Detail A – Front of Rail



Detail B – Rear of Rail



Rack Configurations

This section shows various configurations of multiple attached racks.

Note: Because some racks are connected for high availability, PCI cables might not be installed in your rack.

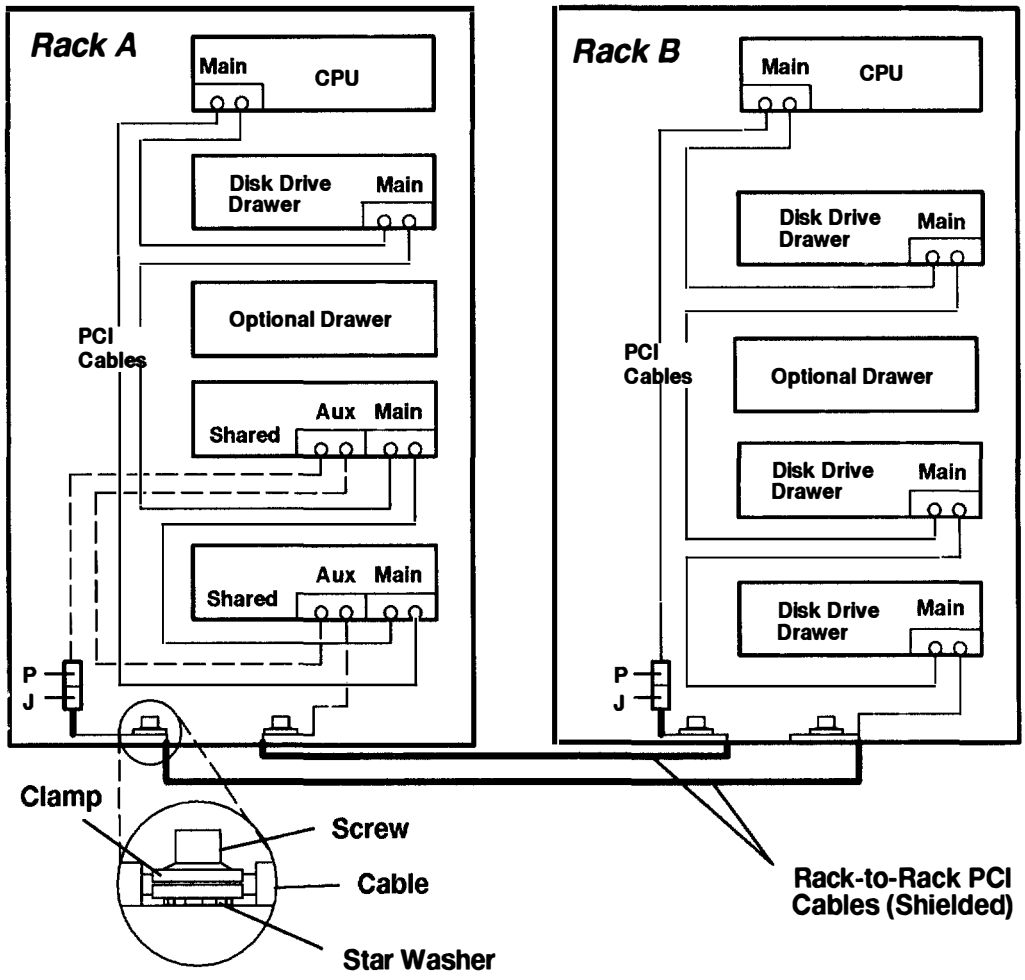
Two 7015 Model R00 Racks with Power Distribution Buses

The following diagram shows a typical way to connect PCI cables between two 7015 Model R00 racks each containing a power distribution bus (not shown).

In this configuration, the CPU in rack A (rack on the left) controls power to the disk drive drawer in rack A. The CPU in rack B (rack on the right) controls power to the three disk drive drawers in rack B.

The two shared drawers in rack A are powered on when the CPU of either rack is powered on, and the shared drawers in rack A are powered off only when the CPUs in both racks are powered off.

The optional drawers in both racks are always powered on.

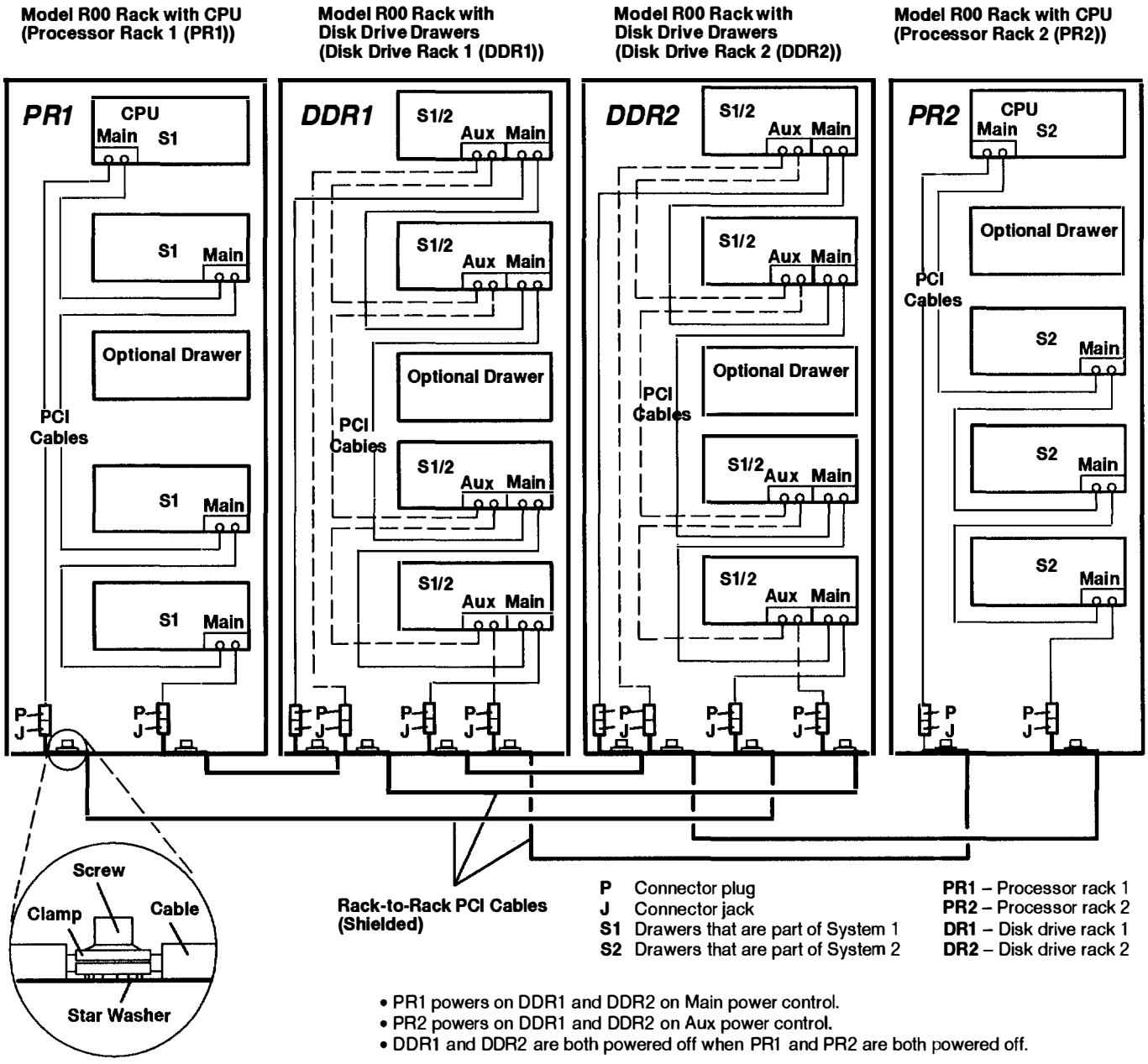


Two Independent Systems Sharing Two Racks Containing Disk Drive Drawers

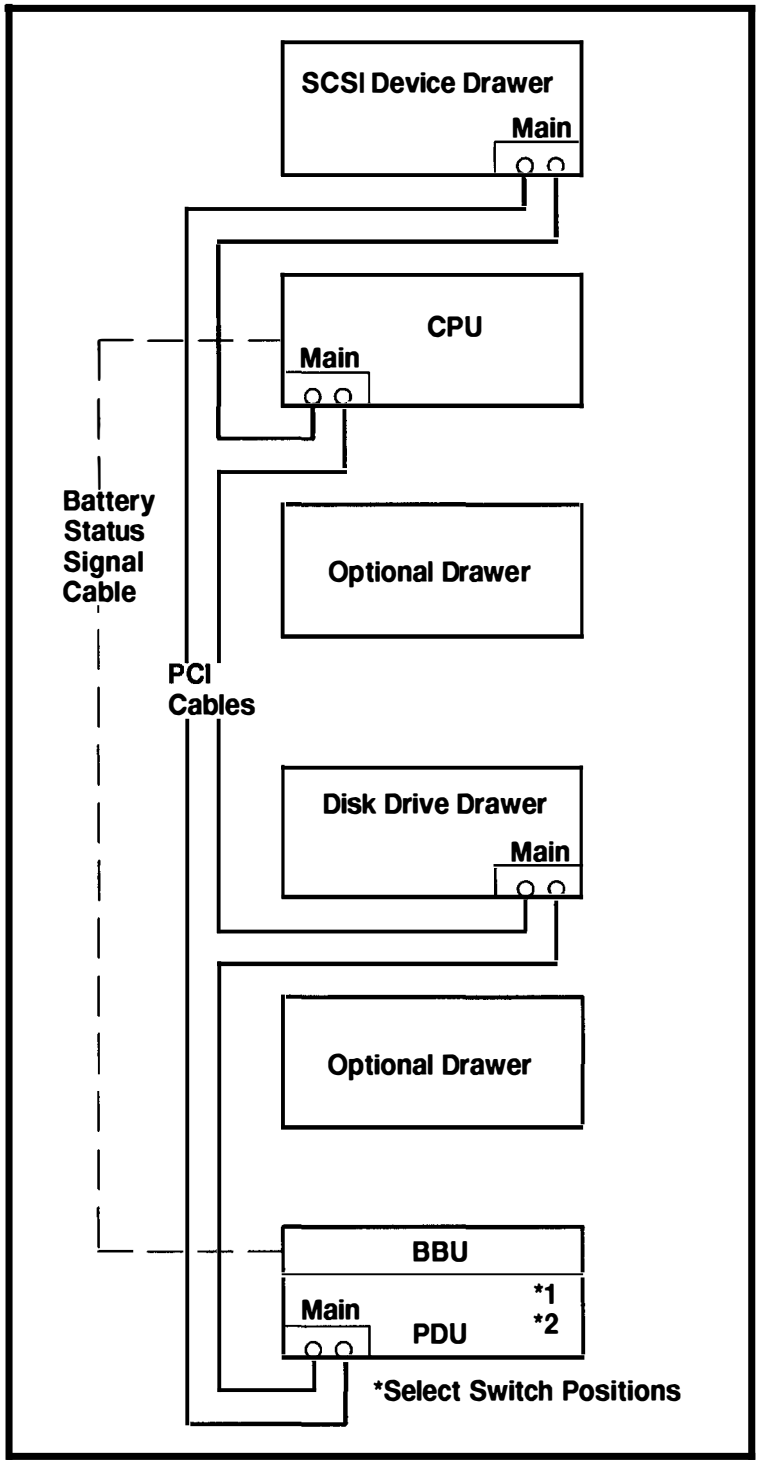
Note: Because some racks are connected for high availability, PCI cables might not be installed in your rack.

The following diagram shows a typical way to connect PCI cables between two 7015 Model R00 racks each containing a CPU and power distribution bus (not shown) and two Model R00 racks containing disk drive drawers. In this configuration, the CPU in rack PR1 controls power to the three S1 drawers in rack PR1. The CPU in rack PR2 controls power to the three S2 drawers in rack PR2.

The CPUs in racks PR1 and PR2 control power to the eight S1/2 drawers in racks DDR1 and DDR2 (center racks). The S1/2 drawers are powered on when either CPU is powered on, and are powered off only when both CPUs are powered off. The optional drawers in racks DDR1 and DDR2 (center racks) are always powered on.



One 7015 Model R00 Rack with Power Distribution Unit



Two 7015 Model R00 Racks with Power Distribution Unit

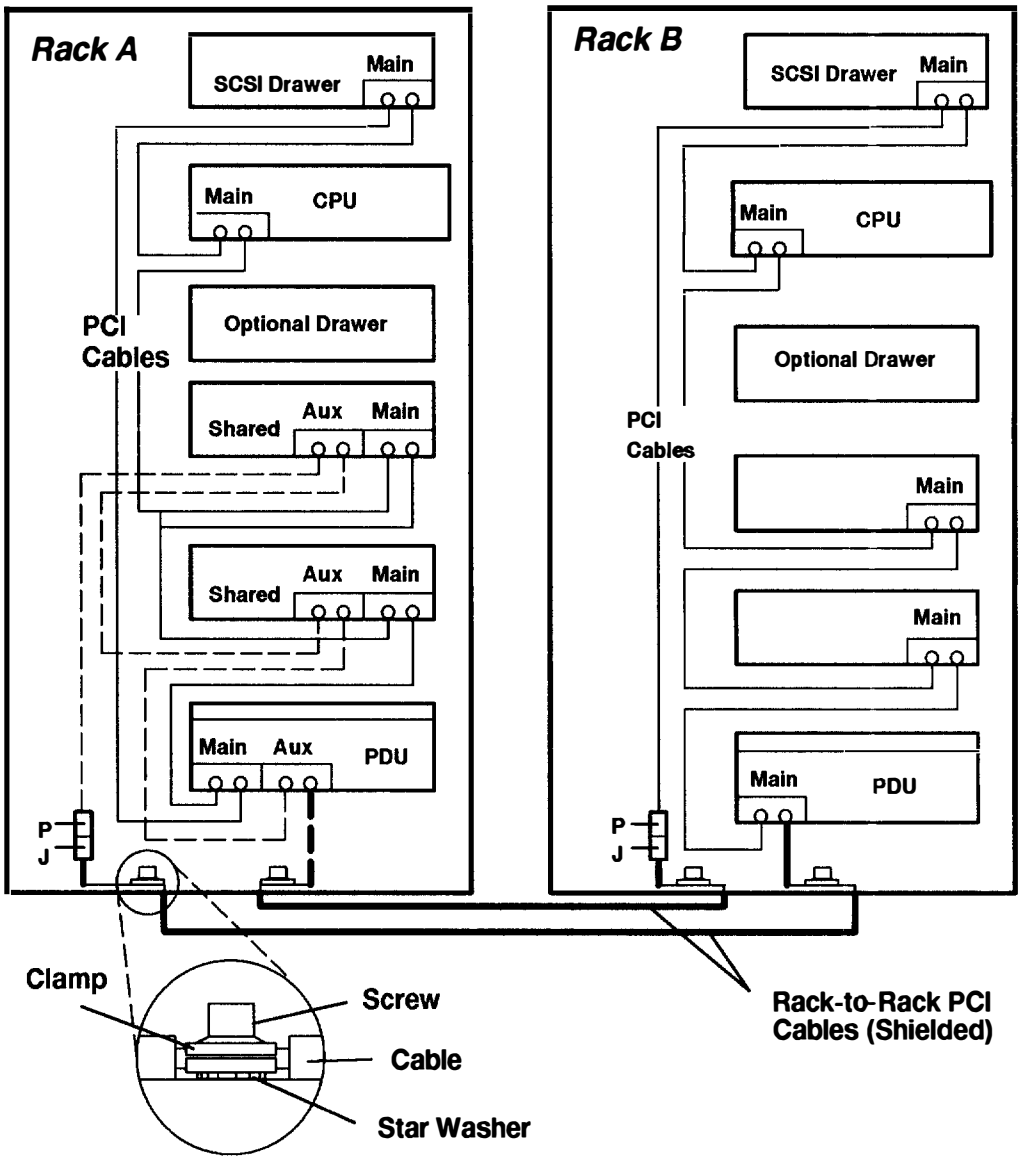
Note: Because some racks are connected for high availability, PCI cables might not be installed in your rack.

The following diagram shows a typical way to connect PCI cables between two 7015 Model R00 racks each containing a CPU and a power distribution unit (PDU). In this configuration, the CPU in rack A (rack on the left) controls power to the SCSI drawer in rack A, and the CPU in rack B (rack on the right) controls power to the SCSI drawer in rack B.

The shared disk drive drawers in rack A are powered on when the CPU of either rack is powered on, and the shared disk drive drawers in rack A are powered off only when the CPUs in both racks are powered off.

The CPU in rack A controls power to the optional drawer in rack A when the power control switch on the PDU is set to 2 (switched). When the power control switch on the PDU is set to 1 (always on), the optional drawer remains powered on.

The CPU and PDU switches in rack B control the optional drawer in rack B in the same manner as with the optional drawer in rack A.



Specifications

Dimensions

Height: 1575 mm (62 inches)

Depth (with standard door): 914 mm (36 inches)

Depth (with deep door): 1041 mm (41 inches)

Width: 648 mm (25.5 inches)

Weight

Standard Configuration: 205 kg (450 pounds)

Maximum Configuration: 455 kg (1000 pounds)

Power

Standard Configuration: 0.6 kVA

Maximum Configuration: 2.2 kVA

System Limit: 4.8 kVA

Operating Voltage

200 to 240 V ac (with AC power source)

-48 V dc (with -48 V dc power source)

Frequency

50 or 60 Hz (with power supply other than -48 V power source)

Temperature Requirements

Operating: 10 to 40°C (50 to 104°F)

Nonoperating: 10 to 52°C (50 to 126°F)

Relative Humidity Requirements (Noncondensing)

8 to 80%

External AC Power Cables

To avoid electrical shock, the manufacturer provides a power cable with a grounded attachment plug. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of the following:

- Electrical cables, type ST
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) L6-30P
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheets C13 and C14.

Power cables used in other countries consist of the following:

- Electrical cables, type HD21 or HD22
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13 and C14.

Refer to Chapter 4 and Chapter 5 in this book to find the power cables that are available for the AC rack and the –48 V dc rack, respectively.

Service Inspection Guide – Rack with Power Distribution Unit or Power Distribution Bus

Perform a service inspection on the system when the following conditions occur:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations-and-attachments review is performed.
- Changes have been made to the equipment that might affect the safe operation of the equipment.
- External devices with an attached power cord are connected to the system unit.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before representatives service the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

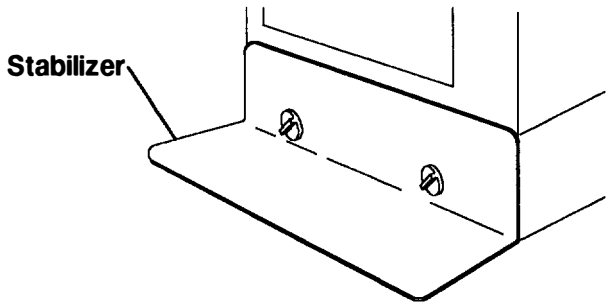
Do the following checks:

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

Note: The rack must be either secured to the floor or the stabilizer must be firmly attached to the bottom-front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the rack is not secured to the floor or the stabilizer is not attached to the rack.

1. Ensure that either the stabilizer is firmly attached to the bottom front of the rack or the rack is firmly secured to the floor.

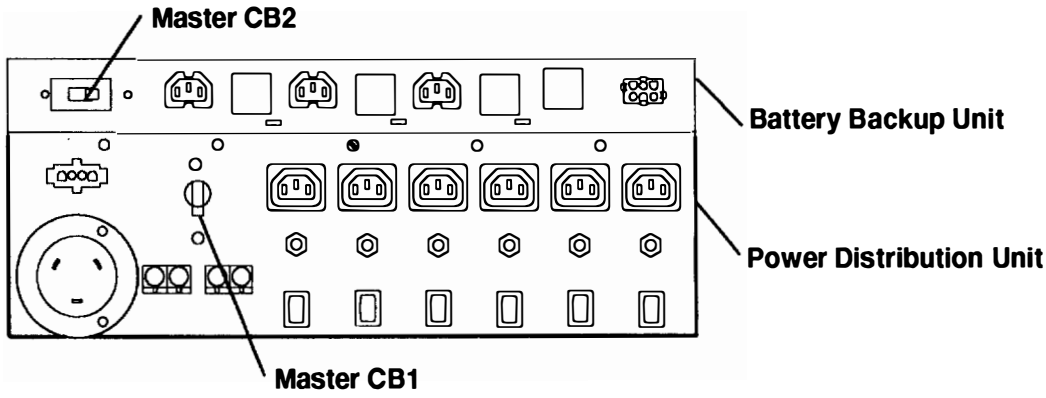


2. Check the covers for sharp edges and for damages or alterations that expose the internal parts of the system unit.
3. Check the covers for a proper fit to the system unit. They should be in place and secure.

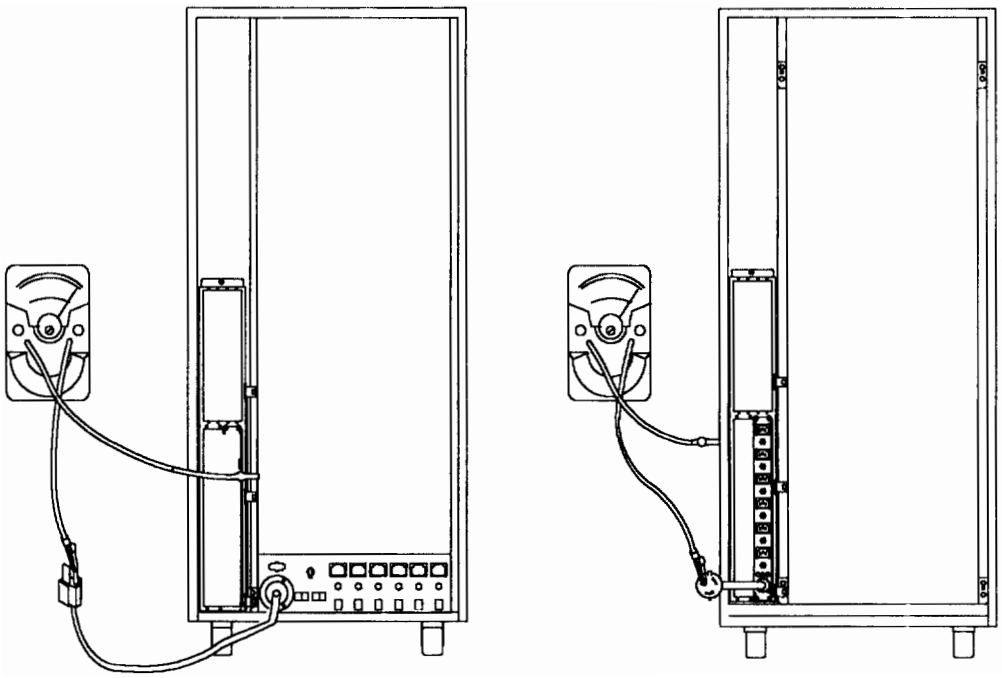
Note: All four batteries must be installed in the battery backup unit for Master CB2 to function.

4. Open the back cover.

5. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
6. Check the internal cables for damage.
7. Check for dirt, water, and any other contamination within the system unit.
8. Check the voltage label on the back of the system unit to ensure that it matches the voltage at the outlet.
9. Check the external power cable for damage.
10. Set the Master CB1 circuit breaker on the power distribution unit to Off.
11. If the battery backup unit is installed, set the Master CB2 circuit breaker to Off.

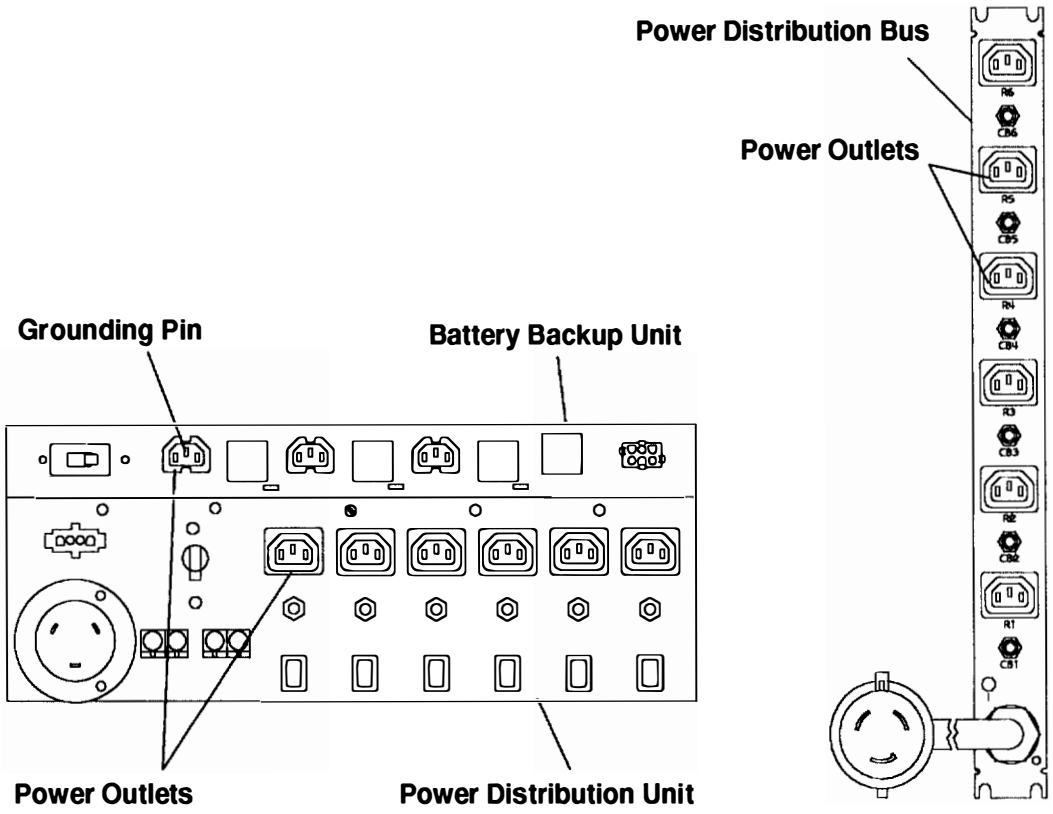


12. With the external power cable connected to the system unit, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.



Note: If your rack contains a power distribution bus (PDB), substitute the PDB in place of the PDU when performing step 13.

13. Using the appropriate probe, check for 0.1 ohm or less resistance between the metal frame and the grounding pin on each of the power outlets on the power distribution bus or power distribution unit and the battery backup unit (R1, R2, R3, . . .).



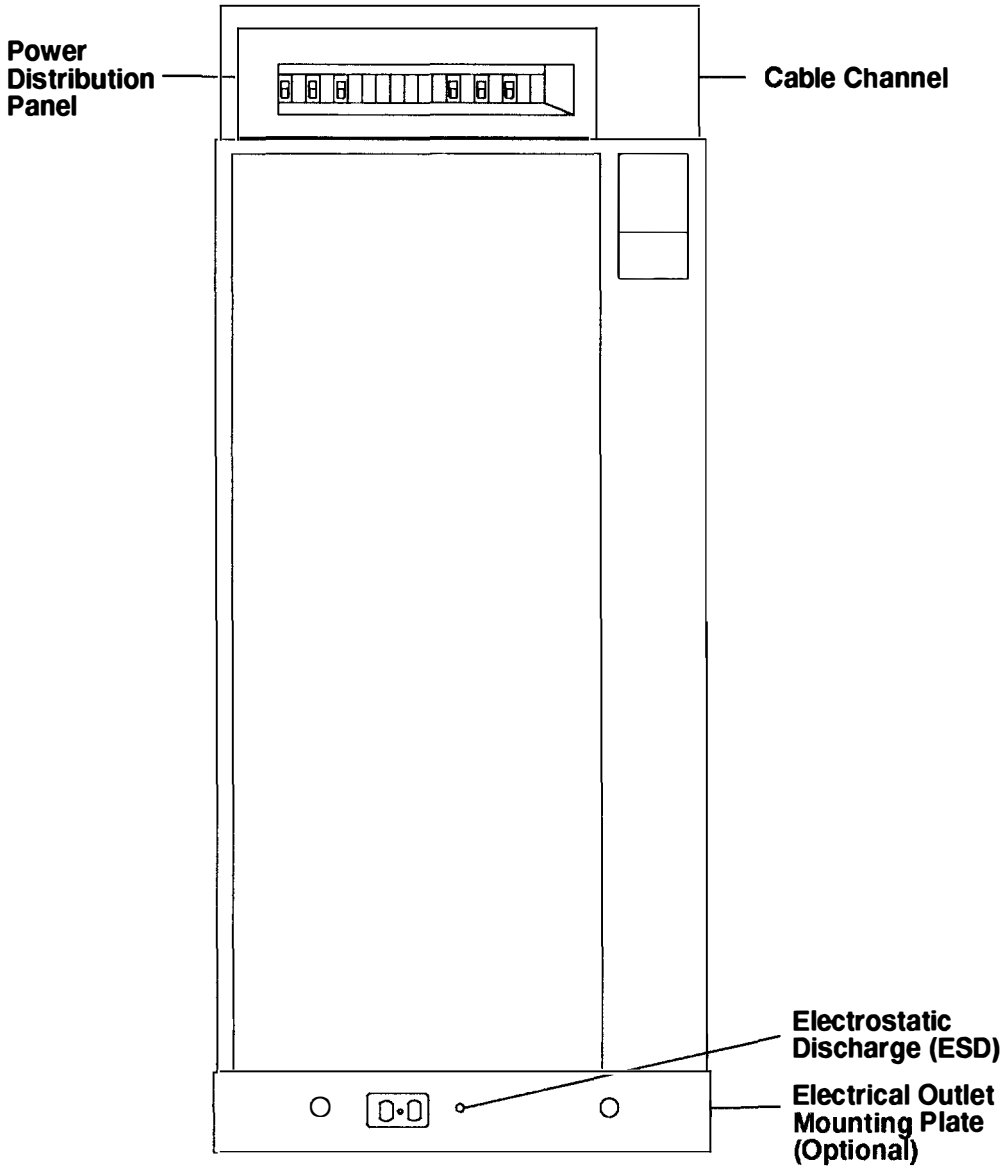
14. Check the following conditions for each external device that has an attached power cord:
    a. Damage to the power cord.
    b. The correct grounded power cord.
    c. With the external power cord connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cord plug and the metal frame of the device.
15. Close the rear cover of the rack.

Chapter 2. Reference Information (-48 V dc Rack)

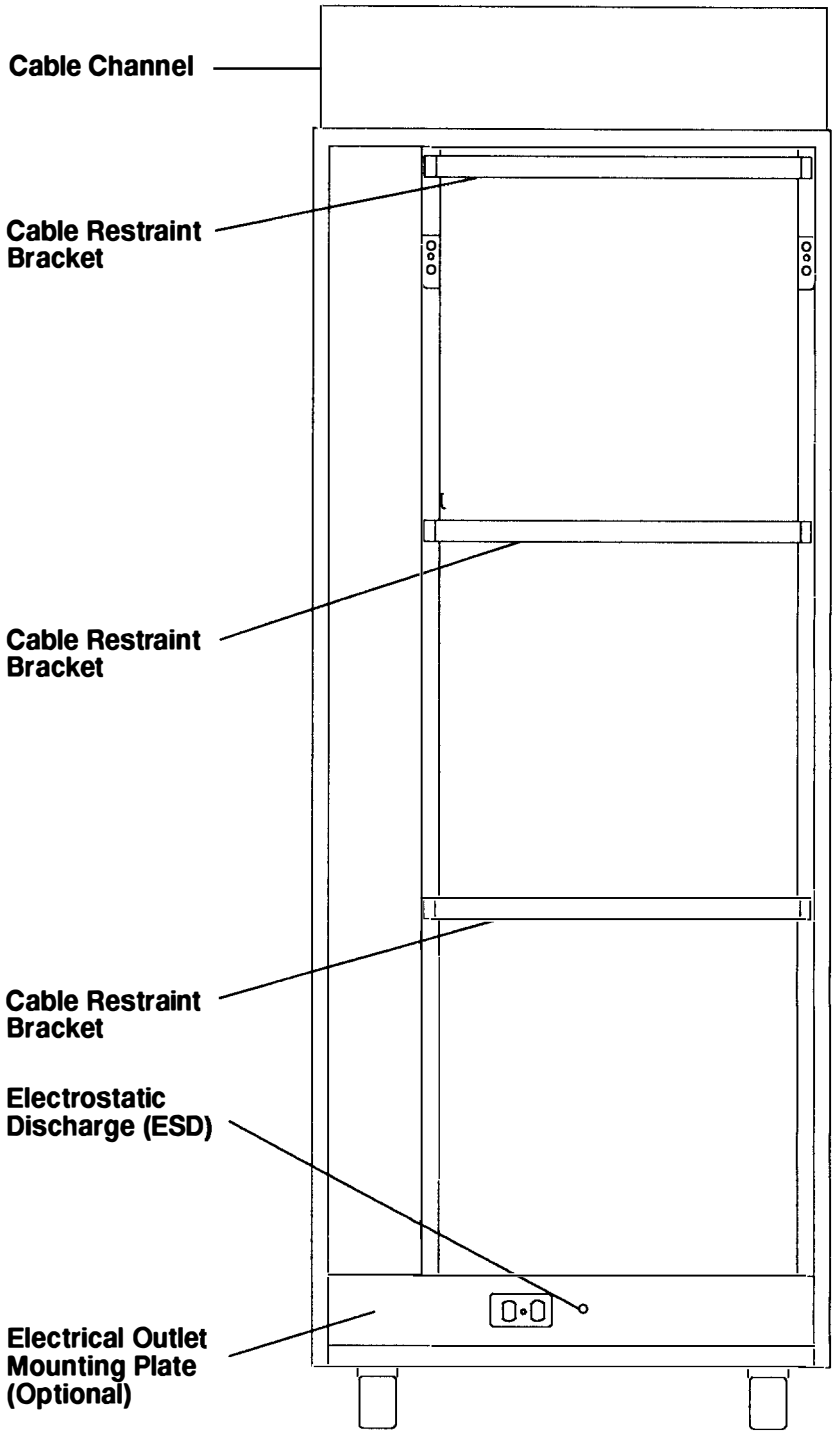
This chapter contains reference information about a -48 V dc rack.

For reference information about an AC rack, see Chapter 1.

-48 V dc Rack (Front View)

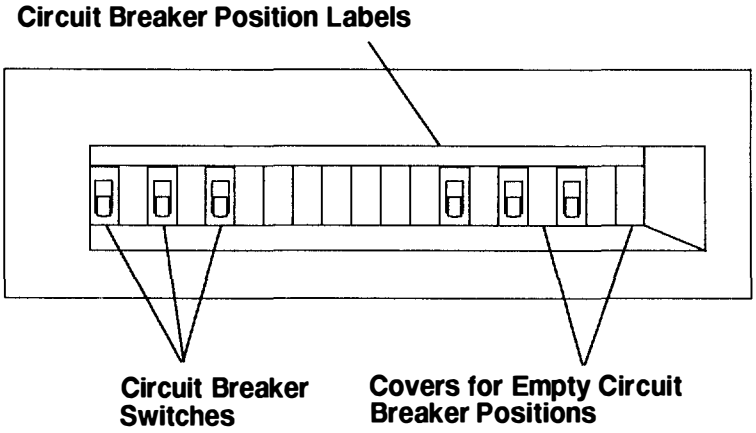


-48 V dc Rack (Rear View)

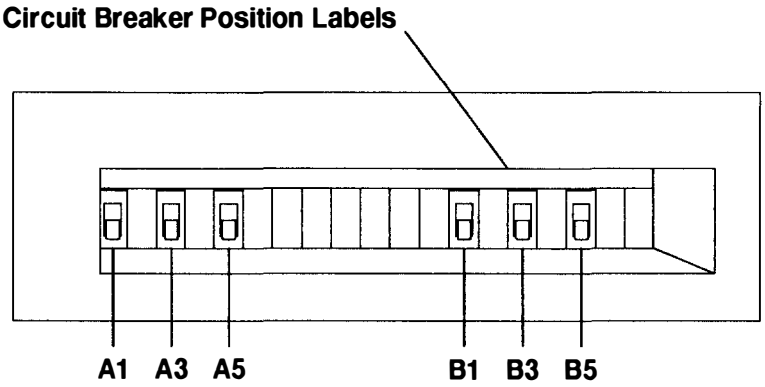


Power Distribution Panel

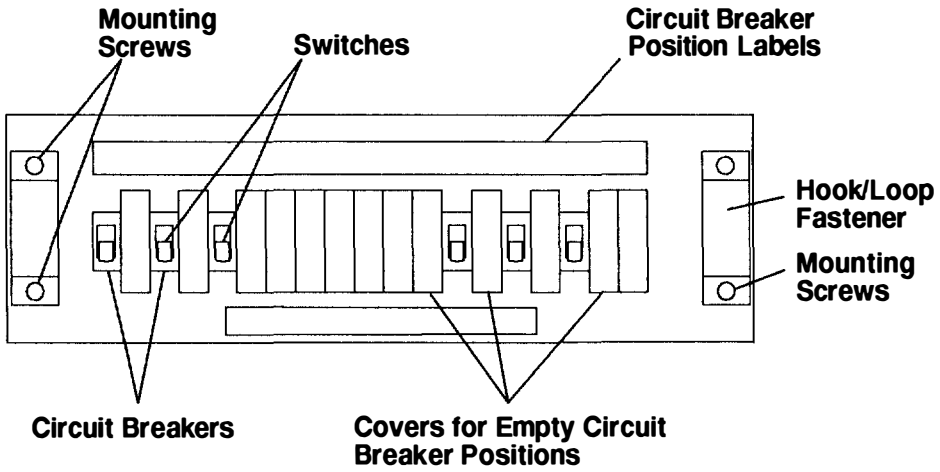
Power Distribution Panel with Bezel (Front View)



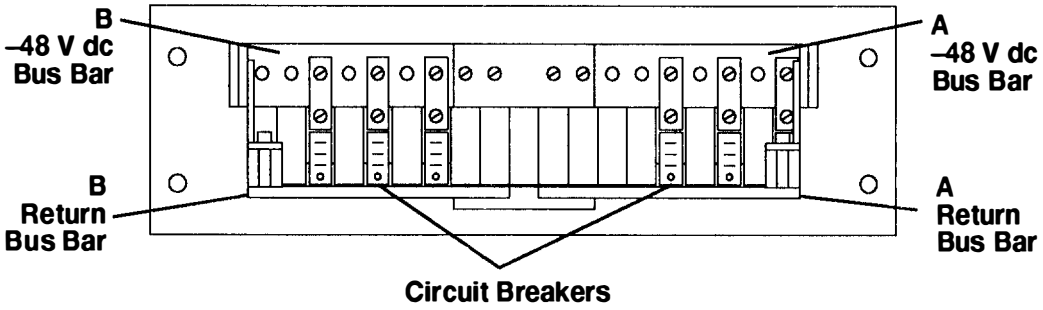
Circuit Breaker Locations and Labels



Power Distribution Panel without Bezel (Front View)



Power Distribution Panel (Rear View)



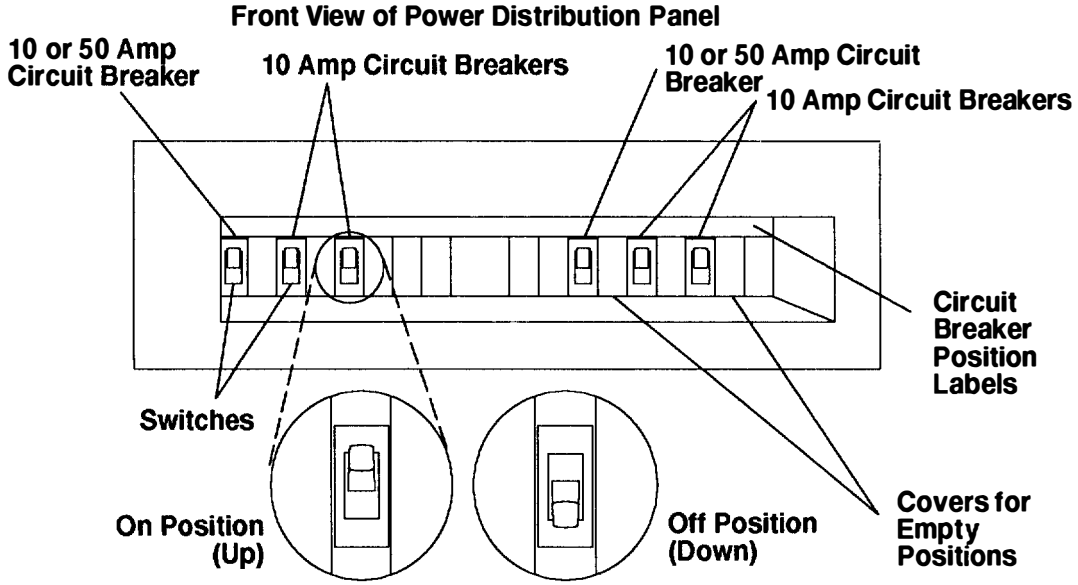
Power Distribution Panel

The power distribution panel (PDP) is installed in a 7015 Model R00 rack when the drawers contain a -48 V dc power supply. The PDP provides circuit breakers that protect each drawer in the rack from excess currents and functions as a DC power switch for switching off power to the rack before servicing.

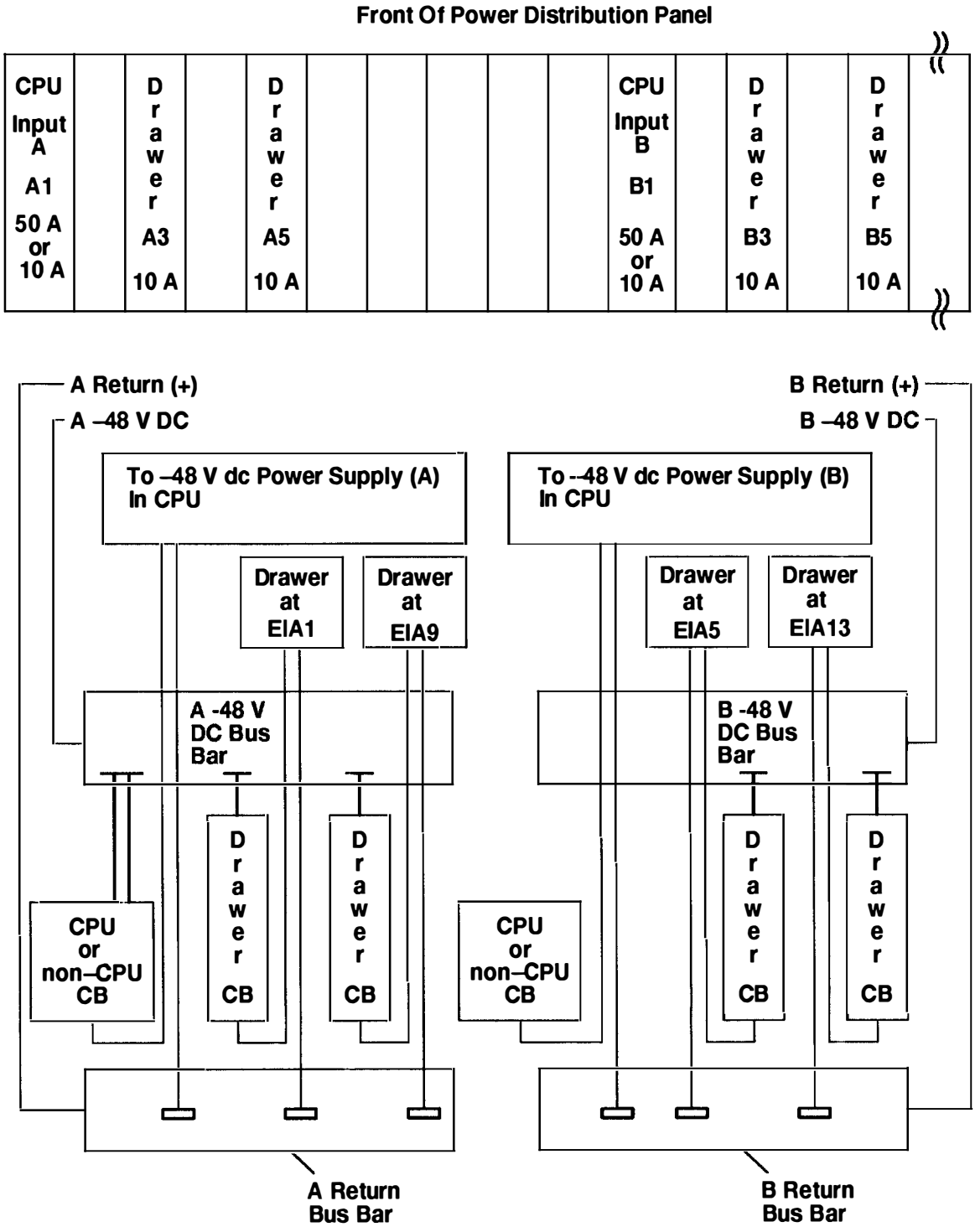
The PDP for a CPU enclosure contains six circuit breakers consisting of two 50-amp circuit breakers and four 10-amp circuit breakers. One of the 50-amp circuit breakers is used to send power to the -48 V dc power supply in the CPU, and the other 50-amp circuit breaker is used to send power to the other -48 V dc power supply in the CPU (when two power supplies are installed). The four 10-amp circuit breakers control power to the disk drive drawers in the rack. If the rack contains no CPU enclosures, then two 10–amp circuit breakers are installed in place of the 50–amp circuit breakers.

The PDP can receive power from a customer's two separate power sources. With this arrangement, three circuit breakers receive power from one power source, and the remaining three circuit breakers receive power from a separate power source. The two 10-amp circuit breakers receiving power from a separate power source can control power to disk drive drawers in an attached rack.

The PDP contains a connection location on the rear cover for attaching a circuit-breaker alarm that indicates when any circuit breaker is switched to the off position; the alarm is provided by the customer. The circuit breaker switch is on when it is in the up position, and the switch is off when it is in the down position.



Power Distribution with the Power Distribution Panel



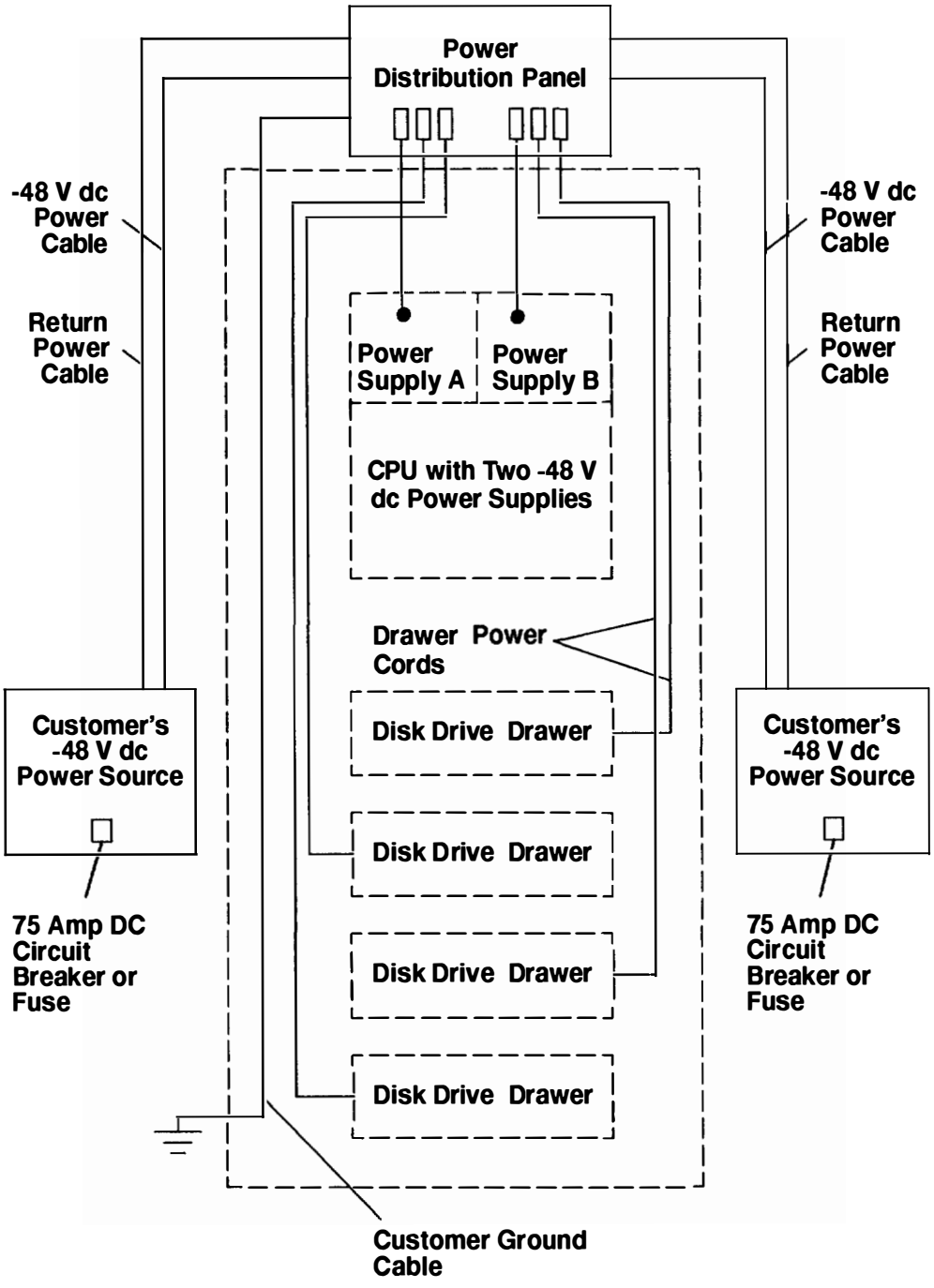
Power Control

A 7015 Model R00 rack containing a CPU with two -48 V dc power supplies, and a -48 V dc power distribution panel (PDP) is a high availability system unit. Power control interface (PCI) cables are not installed in this -48 V dc system unit.

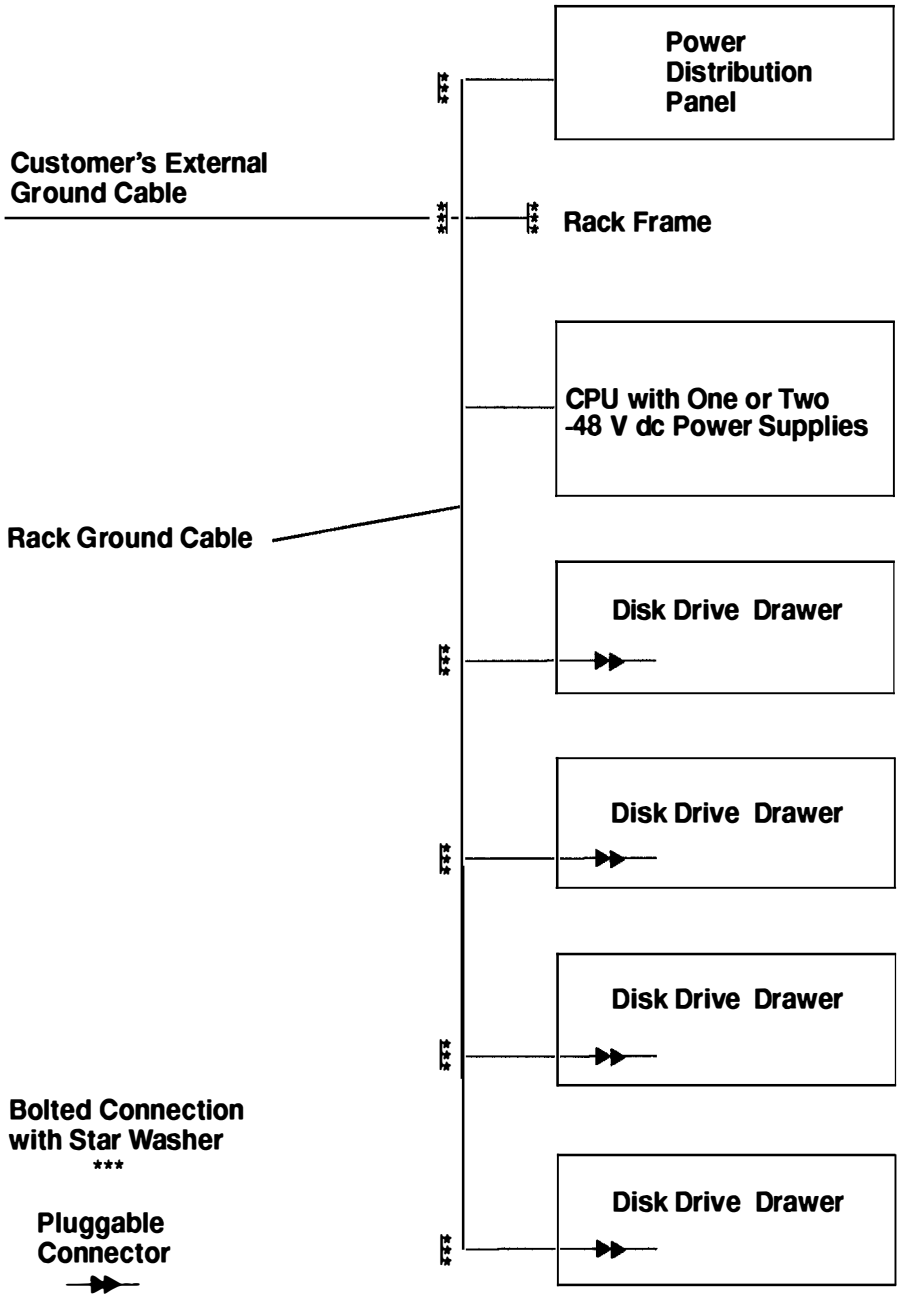
Power is supplied to the PDP from one or two of the customer's external -48 V dc power sources. The -48 V dc power is distributed from the PDP to power supply A and power supply B of the CPU and to a maximum of four disk drive drawers in the rack. The PDP of a 7015 rack can control power to disk drive drawers on an attached 7015 rack or a 7202 rack. The illustration on page 2-5 shows how the power is distributed from the PDP to all drawers in the rack.

Power supply A of the CPU receives power from the A1 circuit breaker and power supply B of the CPU receives power from the B1 circuit breaker.

Note: The 7015 rack is to be connected to a -48 V dc supply source which is electrically isolated from its AC power source. In addition, the -48 V dc supply source is to be reliably connected to a ground.



Grounding Diagram – Power Distribution Panel (-48 V dc)



Specifications

Dimensions

Height: 1746 mm (68 3/4 inches)

Depth with standard door: 914 mm (36 inches)

Depth with deep door: 1041 mm (41 inches)

Width: 648 mm (25.5 inches)

Weight

Standard Configuration: 205 kg (450 pounds)

Maximum Configuration: 455 kg (1000 pounds)

Power

Standard Configuration: 1.5 kVA

Maximum Configuration: 2.0 kVA

System Limit: 4.5 kVA

Operating Voltage

–48 V dc (-40 V dc to -60 V dc for -48 V dc power supply)

Temperature Requirements

Operating: 10 to 40°C (50 to 104°F)

Nonoperating: 10 to 52°C (50 to 126°F)

Relative Humidity Requirements (Noncondensing)

8 to 80%

-48 V dc Power Cables

Note: The customer is responsible for providing power cables from the customer's power source to the power distribution panel (PDP).

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cables have the following characteristics:

- Power cables and ground cables must be a minimum of 6 AWG stranded copper (or equivalent) for lengths up to 50 feet from the power source.
- All connectors must be the copper crimp type (compression). Connector metal must be compatible with the cable metal.

Service Inspection Guide (With Power Distribution Panel)

Perform a service inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations-and-attachments review is performed.
- Changes have been made to the equipment that might affect the safe operation of the equipment.
- External devices with an attached power cord are connected to the system unit.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before representatives service the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

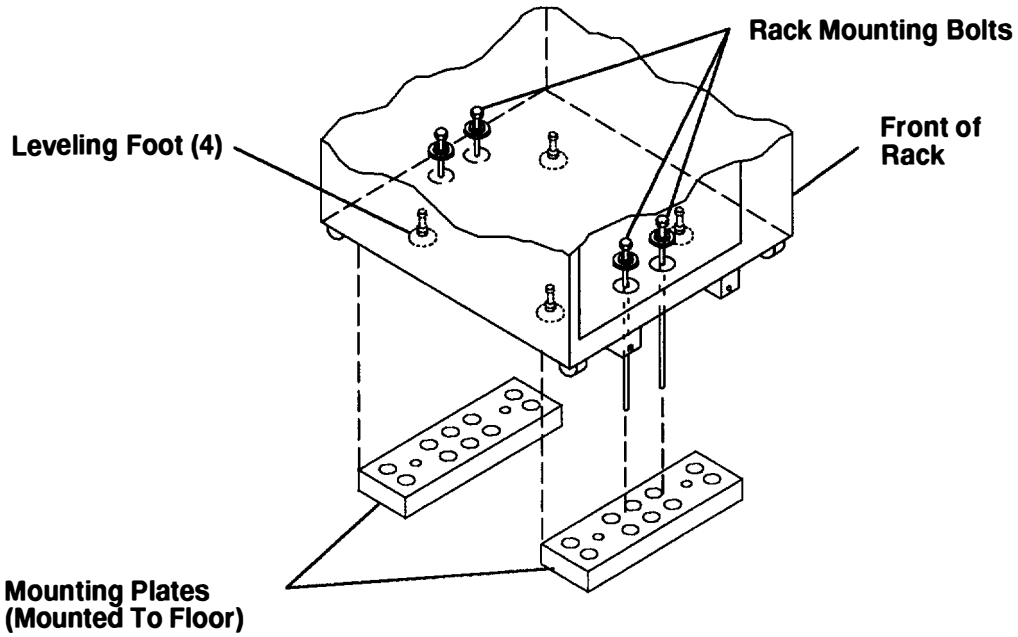
Do the following checks:

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

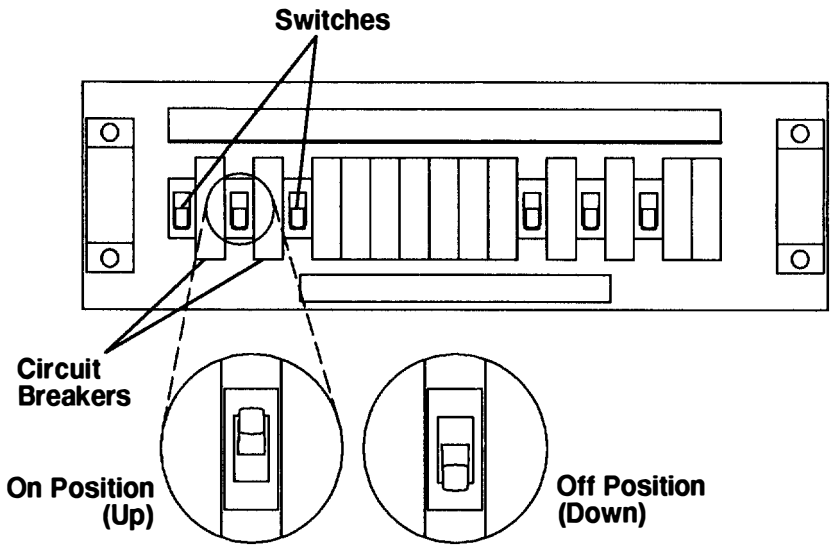
Note: The rack must be either secured to the floor or the stabilizer must be firmly attached to the bottom-front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the rack is not secured to the floor or the stabilizer is not attached to the rack.

1. Ensure that either the rack is level and firmly attached to the floor, or the stabilizer is firmly attached to the bottom-front of the rack.
2. Ensure that the four plastic isolator pads are under the four leveling feet.



3. Check the covers for sharp edges and for damages or alterations that expose the internal parts of the system unit.
4. Check the covers for a proper fit to the system unit. They should be in place and secure.
5. Set all the circuit breaker switches on the PDP to off (switches in the down position).
6. Open the rear door of the rack.
7. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
8. Check the internal cables for damage.
9. Check for dirt, water, and any other contamination within the system unit.
10. Check the voltage label on the back of the system unit to ensure that it matches the voltage at the customer source.
11. Check the external power cable for damage.

Front View of Power Distribution Panel (Without Bezel)



Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

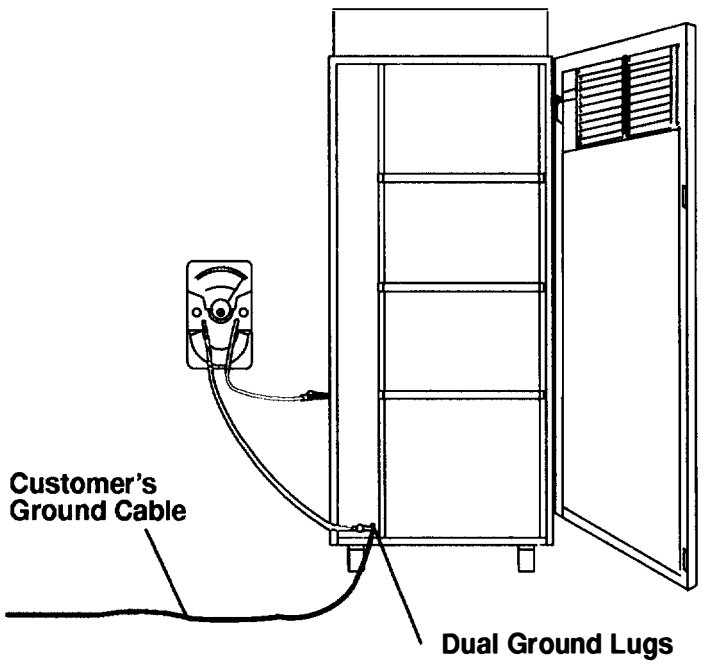
Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

12. With the customer's ground cable connected to the system unit, check for 0.1 ohm or less resistance between the metal frame and the dual ground lugs on the rack.

13. Close the rear cover of the rack.



Chapter 3. Maintenance Analysis Procedures (MAPs)

This chapter provides diagnostic steps for detecting power problems in the rack.

Note: If your system is a 240 V ac system with a battery backup unit, perform the following MAP.

If your system is a –48 V dc system, perform "MAP 1530: Power Distribution Panel – Power MAP" on page 3-1530-1.

If your system is a 240 V ac system and contains a power distribution bus, perform "MAP 1550: Power Distribution Bus – Power MAP" on page 3-1550-1.

MAP 1520: Power Distribution Unit – Power MAP

Note: This MAP is not a start of call MAP. Use this power MAP only if you are directed here from a MAP step in the *POWERstation and POWERserver Common Diagnostics Information Manual.*

This procedure is used to locate power problems in the power distribution unit. If a problem is detected, this procedure will help you to isolate the problem to the failing field replaceable unit (FRU).

If the problem is in the battery backup unit, go to Step 22. Otherwise, go to Step 1.

Observe the following safety notices during service procedures.

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

Attention: This unit may have more than one power supply cord. To completely remove power, you must disconnect all power supply cords.

Step 1

1. Ensure that the Master CB1 circuit breaker (located on the power distribution unit) is set to the On position.
2. If your rack has a battery backup unit, ensure that the Master CB2 circuit breaker is set to the On position.

Did the Master CB1 and Master CB2 circuit breakers go off?

NO Go to Step 25.

YES Go to Step 2.

Step 2

(from Step 1)

1. Set the Master CB1 circuit breaker to Off.
2. Set the Master CB2 circuit breaker to Off.
3. Record the locations of the drawer power cords that are plugged into the power distribution and battery backup units, and then unplug these power cords from the units.
4. Press all of the drawer power reset CBs to ensure that they are set to the On position. Refer to page 1-12.
5. Record the position of each power select switch on the power distribution unit, and then set all of these switches to 1 (always on). Refer to page 1-12.
6. Record and label the power control interface (PCI) cables, and then disconnect them from all the drawers. Refer to page 1-15.
7. Set the Master CB1 circuit breaker to the On position.

Did the Master CB1 circuit breaker stay on?

NO Go to Step 25.

YES Go to Step 3.

Step 3

(from Step 2)

1. Set the Master CB1 circuit breaker to the Off position.
2. Plug the CPU enclosure power cable into an outlet on the power distribution unit.
3. Set the Master CB1 circuit breaker to the On position.
4. Set the key mode switch to the Service position.
5. Set the power button located on the CPU enclosure to on (button pushed in).

Did the CPU enclosure Power light come on and stay on?

NO Go to Step 4.

YES Go to Step 8.

Step 4

(from Step 3)

Did the drawer power reset CB on the power distribution unit go to the Off position (pop out)?

NO Go to Step 5.

YES Go to Step 7.

Step 5

(from Step 4)

1. Set the Master CB1 circuit breaker to the Off position.
2. Plug the CPU enclosure power cable into another outlet on the power distribution unit.
3. Set the Master CB1 circuit breaker to the On position.
4. Set the power button located on the CPU enclosure to on (button pushed in).

Did the CPU enclosure Power light come on and stay on?

NO Go to Step 6.

YES The first outlet is defective. Use the second outlet, or exchange the power distribution unit, and then go to Step 25.

Step 6

(from Step 5)

1. Set the Master CB1 circuit breaker to the Off position.
2. Plug the power cable of another drawer into the same outlet.
3. Set the Master CB1 circuit breaker to the On position.
4. Switch on power to the drawer.

The green light near the AC plug on the rear of some drawers indicates only that power is reaching the drawer and not that the power supply is operating.

Did the drawer Power light come on and stay on, or are the fans operating?

NO Exchange the power distribution unit, and then go to Step 25.

YES Depending on the system unit installed in your rack, go to "MAP 1520: Power MAP" in either the *7015 POWERserver CPU Drawer Service Guide* or the *7015 POWERserver CPU Enclosure Service Guide*.

Step 7

(from Step 4)

1. Set the Master CB1 circuit breaker to the Off position.
2. Plug the CPU enclosure power cable into another outlet on the power distribution unit.
3. Set the Master CB1 circuit breaker to the On position.
4. Press the Power On button.

Did the circuit breaker go to the Off position (pop out)?

NO The first circuit breaker is probably defective. Use the second outlet, or exchange the power distribution unit, and then go to Step 25.

YES The drawer is overloading the circuit breaker. Exchange the CPU drawer power cable or power supply, and then go to Step 25.

Step 8

(from Step 3)

1. Set the Master CB1 circuit breaker to the Off position.
2. Plug the power cable of another drawer into an outlet on the power distribution unit.
3. Set the Master CB1 circuit breaker to the On position.
4. Switch on power to the drawer.

Did the Power light come on and stay on, or are the fans operating?

NO Go to Step 9.

YES Repeat this step until power is on in all of the drawers, and then continue with Step 10.

Step 9

(from Step 8)

1. Switch off power to the drawer.
2. Plug the power cable into another outlet on the power distribution unit.
3. Switch on power to the drawer.

Did the Power light come on and stay on, or are the fans operating?

NO Go to the power MAP for this drawer (located in the service guide for the drawer).

YES The first circuit breaker is probably defective. Use the second outlet, or exchange the power distribution unit, and then go to Step 25.

Step 10

(from Step 8)

Note: If your system is a high availability system, all PCI cables going to the CPU enclosure must be disconnected.

All of the drawers are working correctly. Use the following steps to check the network that controls power to the drawers.

The power button on the CPU enclosure can be used to control power at the AC power outlets of the power distribution unit (PDU) or at the drawer power supplies.

The power control system uses power control interface (PCI) cables (connected in series between the drawers) to control power to the drawers or at the drawers.

Relays inside the PDU can be switched at each AC power outlet to send power to each drawer. Power control switches located below each AC power outlet on the PDU can be used to bypass the relays to send power directly to selected drawers.

The DC output at each drawer power supply can be switched on and off if power is available at the drawer power input.

To control power at a selected drawer, set the power control switch on the PDU for that drawer to 1 (always on). To control power at the PDU, set the power control switch for that drawer to 2 (switched). Combinations of these settings may be used at the same time.

The power control switch to the CPU enclosure must always be set to 1 (always on).

Attention: You will switch off power to a drawer that is operating if you connect a PCI cable to that drawer.

1. Set the power button to off (button in the out position).
2. On the 7015 CPU Enclosure, connect a PCI cable from connector J210 or J211 to connector J19 or J20 of a disk drive drawer.
3. Ensure that the power select switches are set to 1 (always on).
4. Set the power button to on (button pushed in), and then set the power button to off (button pushed in and then released into the out position).

Did the drawer that you connected switch on and off?

NO Go to Step 11.

YES Repeat this step for all of the drawers that have PCI cables connected to them, and then go to Step 13.

Step 11

(from Step 10)

1. Use a different PCI cable to connect the CPU enclosure to the async or a disk drive drawer used in Step 10.
2. Set the power button to on (button pushed in), and then set the power button to off (button pushed in and then released into the out position).

Did the drawer that you connected switch on and off?

NO Go to Step 12.

YES Exchange the defective PCI cable, and then go to Step 17.

Step 12

(from Step 11)

1. Set the power select switch of the power connector for the drawer that you connected to 2 (switched).
2. Disconnect the PCI cable from the async or SCSI device drawer, and then connect the cable to connector J3 or J4 on the power distribution unit.
3. Set the power button to on (button pushed in), and then set the power button to off (button pushed in and then released into the out position).

Did the drawer that you disconnected switch on and off?

NO The CPU enclosure is not producing a power control signal. Exchange the CPU enclosure operator panel or power supply, and then go to Step 17.

YES The drawer did not detect the power control signal. Exchange the drawer power supply, and then go to Step 17.

Step 13

(from Step 10)

Does the system contain any drawers that do not have PCI connectors?

NO All of the drawers are operating correctly. This completes the repair. Go to Step 17.

YES Go to Step 14.

Step 14

(from Step 13)

1. Press the Power On button.
2. Connect a PCI cable from connector J3 or J4 on the CPU drawer to connector J3 or J4 on the power distribution unit.
3. Set the power select switch of the power connector for one of these drawers to 2 (switched).
4. If available, switch on the power switch of the drawer.
5. Press the Power On button, and then press the Power Off button.

Did the drawer switch on and off?

NO Go to Step 15.

YES Repeat this step until all of the drawers without PCI cables are operating correctly, and then go to Step 17.

Step 15

(from Step 14)

1. Use a different PCI cable to connect the CPU enclosure to the power distribution unit.
2. Set the power button to on (button pushed in), and then set the power button to off (button pushed in and then released into the out position).

Did the drawer switch on and off?

NO Go to Step 16.

YES Go to Step 25.

Step 16

(from Step 15)

1. Disconnect the power cable of the drawer you are checking from the outlet on the power distribution unit, and then connect the cable to another outlet on the PDU.
2. Set the power select switch of the power connector for the drawer to 2 (switched).
3. Set the power button to on (button pushed in), and then set the power button to off (button pushed in and then released into the out position).

Did the drawer switch on and off?

NO Exchange the power distribution unit, and then go to Step 25.

YES The circuit breaker of the first outlet that the drawer was connected to is probably defective. Use the second outlet, or exchange the power distribution unit, and then go to Step 25.

Step 17

(from Steps 11, 12, 13, and 14)

1. Set the power button to on (button pushed in).
2. Reconnect all of the PCI cables to the connectors from which they were disconnected.
3. Ensure that the power select switch for the CPU drawer or CPU enclosure is set to 1 (always on). Except for the CPU drawer, set the power select switches for the drawers using PCI cables to 2 (switched).
4. Set the power button to off (button pushed and released in the out position).

Did all of the drawers switch on?

NO Go to Step 18.

YES Go to Step 19.

Step 18

(from Step 17)

Did some of the drawers switch on?

NO Exchange the operator panel, PCI cables, or power distribution unit, and then go to Step 25.

YES Exchange the PCI cable or power supply of the drawer that did not switch on, or exchange the power distribution unit. After you exchange the part, go to Step 25.

Step 19

(from Step 17)

1. Set the power button to on (button pushed in).
2. Set the Master CB1 circuit breaker to the Off position.
3. Set all of the power select switches to the 1 position.
4. Set the Master CB1 circuit breaker to the On position.
5. Set the power button to off (button pushed and released in the out position).

Did all of the drawers switch on?

NO Exchange the CPU enclosure control panel, PCI cables, power supply of the drawer that did not switch on, or exchange the power distribution unit, and then go to Step 25.

YES If a battery backup unit is installed, go to Step 20.

If a battery backup unit is not installed, go to Step 25.

Step 20

(from Step 19)

Measure the battery voltage between pins 3 and 4 on connector JD2. Pin 1 is on the left.

If the battery voltage is less than 48 V dc, allow the batteries to be charged to 50 V dc before continuing with this step.

To become fully charged, batteries must be charged at a rate of one hour for each minute they are discharged.

To charge the batteries, set the Master CB1 and Master CB2 circuit breakers to the On position.

1. Set the key mode switch to the Service position.
2. Set the power button to off (button pushed and released in the out position).
3. Set the Master CB2 circuit breaker to Off.
4. Set the Master CB1 circuit breaker to Off.
5. Set all power select switches to their original positions.
6. Connect all PCI cables to their original connectors.
7. Connect all drawer power cables to their original power outlets on the power distribution unit and battery backup unit.
8. Set the Master CB2 circuit breaker to On.
9. Set the Master CB1 circuit breaker to On.
10. Set the power button to on (button pushed in).

Did the power indicator light of the drawers attached to the battery backup unit come on and stay on?

NO	Go to Step 21.
YES	Go to Step 22.

Step 21

(from Step 20)

1. Set the Master CB2 circuit breaker to Off.
2. Set the Master CB1 circuit breaker to Off.
3. To check the three fuses for continuity, disconnect all power cables from the DC power outlets located at the rear of the battery backup unit.
4. Move the three fuse safety covers to the left to expose the fuse caps.
5. To remove each fuse cap, push the fuse cap in while turning it counterclockwise.
6. Verify that the three fuses have continuity.

Do the three fuses have continuity?

NO	Replace the failing fuses. Note that the drawer connected to the outlet with the failed fuse may be defective. Go to Step 25.
YES	Replace the battery backup unit. Go to Step 25.

Step 22

(from Step 20)

1. Set the power button to off (button pushed and released in the out position).
2. Set the Master CB2 circuit breaker to Off.
3. Set the Master CB1 circuit breaker to Off.
4. Set the Master CB2 circuit breaker to On.
5. Measure and record the battery voltage between pins 3 and 4 on connector JD2. Pin 1 is on the left. Do not remove your meter from pins 3 and 4 on connector JD2.
6. Set the Master CB1 circuit breaker to On.

If the battery charger is working correctly, the battery voltage will increase by 0.1 V or more.

Did the voltage increase?

NO	Replace the battery backup unit, and then go to Step 25.
YES	Go to Step 23.

Step 23

(from Step 22)

1. Set the Master CB2 circuit breaker to On.
2. Set the Master CB1 circuit breaker to On.
3. Set the power button to on (button pushed in).
4. Set the Master CB1 circuit breaker to the Off position. This causes the batteries to supply power to the drawers that are plugged into the battery backup unit.
5. If the battery backup unit is working correctly, the following conditions will occur:
   a. The In Use light on the front of the battery backup unit is on.
   b. The cooling fan in the battery backup unit is running.
   c. The power indicator lights on the drawers that are plugged into the battery backup unit are on.

Did all the conditions in substep 5 occur?

NO Do the following:

1. Set the power button to off (button pushed and released in the out position).
2. Set the Master CB2 circuit breaker to Off.
3. Exchange a battery with an operational battery, and then repeat Step 23. If the batteries are more than 5 years old, exchange all of the batteries.
4. If all the batteries have been exchanged, replace the battery backup unit, and then go to Step 25.

YES Go to Step 24.

Step 24

(from Step 23)

1. Set the Master CB2 circuit breaker to the Off position.
2. Set the Master CB1 circuit breaker to the Off position.
3. Disconnect the four batteries from the connectors on the right side of the battery backup unit.
4. Measure and record the voltage of each battery.
5. Reconnect the batteries into the connectors on the right side of the battery backup unit.
6. Set the Master CB2 circuit breaker to the On position.
7. Set the Master CB1 circuit breaker to the On position.
8. Set the power button to on (button pushed in).
9. Set the Master CB1 circuit breaker to Off. This causes the batteries to supply power to the drawers that are plugged into the battery backup unit.

   If the batteries are working correctly, the drawers plugged into the battery backup unit should continue to run for at least 3 minutes.

Did the drawers that are plugged into the battery backup unit continue to run for at least 3 minutes?

NO Do the following:

1. Set the power button to off (button pushed and released in the out position).
2. Set the Master CB2 circuit breaker to the Off position.
3. Beginning with the battery with the lowest voltage, exchange a battery with an operational one, and then repeat Step 23 starting with substep 4. If the batteries are more than 5 years old, exchange all four batteries.
4. If all the batteries have been exchanged, replace the battery backup unit, and then go to Step 25.

YES Go to Step 25.

Step 25

(from Steps 1, 2, 5, 6, 7, 9, 15, 16, 18, 19, 21, 22, 23, and 24)

1. Set the power button to off (button pushed and released in the out position).
2. Set the Master CB2 circuit breaker to the Off position.
3. Set the Master CB1 circuit breaker to the Off position.
4. Set all power select switches to their original positions.
5. Connect all PCI cables to their original connectors.
6. Connect all drawer power cables to their original power outlets on the power distribution unit and battery backup unit.
7. Set the Master CB2 circuit breaker to the On position.
8. Set the Master CB1 circuit breaker to the On position.
9. This completes the repair. Go to "MAP 0410: Repair Checkout" in the *POWERstation and POWERserver Common Diagnostics Information Manual*.

Note: If your system is a –48 V dc system, perform the following MAP.

If your system is a 240 V ac system, perform "MAP 1520: Power Distribution Unit – Power MAP" on page 3-1520-1.

If your system is a 240 V ac system and contains a power distribution bus, perform "MAP 1550: Power Distribution Bus – Power MAP" on page 3-1550-1.

MAP 1530: Power Distribution Panel – Power MAP

Note: This MAP is not a start of call MAP. Use this power MAP only if you are directed here from a MAP step in the *POWERstation and POWERserver Common Diagnostics Information Manual.*

This procedure is used to locate power problems in the power distribution panel (PDP). If a problem is detected, this procedure will help you to isolate the problem to the failing field replaceable unit (FRU).

Observe the following safety notices during service procedures.

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Note: An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.

Step 1

1. Turn the key mode switch to the Service position.
2. Set the power button located on the CPU enclosure to off (button in the out position).
3. Set the drawer power switch on all of the disk-drive-subsystem drawers to the Off position.
4. Remove the six screws attaching the PDP top cover to the PDP, and then remove the top cover.
5. Using a multimeter, attach the black multimeter cable lead to the return bus bar (+), and then attach the red multimeter cable lead to the –48 V dc bus bar (–).
6. Measure for -40 to -60 V dc between the –48 V dc bus bar (upper bar) and the return bus bar (lower bar) in the power distribution panel.

Was the correct voltage present?

NO Check the customer power source for the correct voltage, and check the external power cables (from customer's power source) for continuity.

YES Go to Step 2.

Step 2

(from Step 1)

1. Except for the 50-amp circuit breaker in the first position (first circuit breaker from your left facing the front), set all of the circuit breaker switches to the Off position (switches in the down position).
2. Label and record the locations of the power cords from the CPU enclosure and the disk-drive-subsystem drawers.
3. Disconnect the power cables from the CPU enclosure.
4. Disconnect the power cables from the disk drive subsystem drawers.
5. Set all of the circuit breaker switches of the power distribution panel to the On position.
6. Measure for -40 to -60 V dc on terminal board 2 (TB2) between positions one and two (side A circuit breakers) and between positions five and six (side B circuit breakers).

Is the voltage between -40 and -60 V dc?

NO Go to Step 3.

YES Before removing any circuit breakers, ensure that external power is not present in the rack.

Exchange each circuit breaker until all of the circuit breakers are exchanged or until -40 to -60 V dc is available. For information about removing circuit breakers, refer to the "Circuit Breaker" removal and replacement procedure on page 5-9.

If the symptom did not change and all of the circuit breakers are exchanged, replace the power distribution panel.

Go to Step 7.

Step 3

(from Step 2)

1. Set the 50-amp circuit breaker switch (labeled A1) of the power distribution panel to the Off position.
2. Plug the power cord into the CPU enclosure.
3. Set the 50 amp circuit breaker switch (A1) of the power distribution panel to On position.
4. Measure for -40 to -60 V dc on TB2 between positions one and two (side A circuit breakers) and between positions five and six (side B circuit breakers).

Is the voltage between -40 and -60 V dc?

NO Go to Step 4.

YES To test each FRU, exchange the FRUs in the following order:

Before removing a circuit breaker, ensure that external power is not present in the rack.

1. Circuit breaker A1. For information about removing circuit breakers, refer to the "Circuit Breaker" removal and replacement procedure beginning on page 5-9.
2. CPU Enclosure -48 V dc power supply. For information about removing the power supply, refer to *7015 Model R30 CPU Enclosure Installation and Service Guide*.

If the symptom did not change and all the FRUs are exchanged, go to "MAP 1520: CPU Enclosure – Power MAP" in the *7015 Model R30 CPU Enclosure Installation and Service Guide*.

Go to Step 7.

Step 4

(from Step 3)

1. Set the power button located on the CPU Enclosure to on (button pushed in).
2. Measure for -40 to -60 V dc on TB2 between positions one and two (side A circuit breakers) and between positions five and six (side B circuit breakers).

Is the voltage between -40 and -60 V dc?

NO Go to Step 5.

YES Go to "MAP 1520: CPU Enclosure – Power MAP" in the *7015 Model R30 CPU Enclosure Installation and Service Guide*.

Step 5

(from Step 4)

1. Starting with the circuit breaker labeled A5, set a10-amp circuit breaker switch to the Off position.
2. From the same circuit breaker, plug the power cord into the correct disk-drive-subsystem drawer.
3. Set the circuit breaker switch to the On position.
4. Measure for -40 to -60 V dc on TB2 between positions one and two (side A circuit breakers) and between positions five and six (side B circuit breakers).

Is the voltage between -40 and -60 V dc?

NO Repeat this step until all of the power cords are reconnected to the disk–drive-subsystem drawers.

Go to Step 6.

YES To test each FRU, exchange the FRUs in the following order:

Before removing a circuit breaker, ensure that external power is not present in the rack.

1. 10-amp circuit breaker (last one set to On). For information about removing circuit breakers, refer to the "Circuit Breaker" removal and replacement procedure beginning on page 5-9.
2. Power supply for disk-drive-subsystem drawer. For information about removing the power supply, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*.

If the symptom did not change and all the FRUs are exchanged, go to "MAP2010: 9333 Model 010 – Start" in the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*.

Go to Step 7.

Step 6

(from Step 5)

1. Set the drawer power switch of one of the disk-drive-subsystem drawers to the On position.
2. Measure for -40 to -60 V dc on TB2 between positions one and two (side A circuit breakers) and between positions five and six (side B circuit breakers).

Is the voltage between -40 and -60 V dc?

NO Repeat this step until the drawer power switch of all the disk–drive–subsystem drawers are set to the On position.

Go to Step 7.

YES Go to "MAP 2010: 9333 Model 010 – Start" in the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*.

Step 7

(from Steps 2, 3, 5 and 6)

1. Set the power button to off (button in the out position).
2. Set all the circuit breaker switches on the power distribution panel to Off.
3. Connect the power cables from the CPU enclosure and the disk drive subsystem drives.
4. Set all of the circuit breaker switches on the power distribution panel to On.
5. This completes the repair. Go to "MAP 0410: Repair Checkout" in the *POWERstation and POWERserver Common Diagnostics Information Manual*.

Note: If your system is a 240 V ac system and contains a power distribution bus, perform the following MAP.

If your system is a 240 V ac system with a battery backup unit, perform "MAP 1520: Power Distribution Unit – Power MAP" on page 3-1520-1.

If your system is a –48 V dc system, perform "MAP 1530: Power Distribution Panel – Power MAP" on page 3-1530-1.

MAP 1550: Power Distribution Bus – Power MAP

Notes:

This MAP is not a start of call MAP. Use this power MAP only if you are directed here from a MAP step in the *POWERstation and POWERserver Common Diagnostics Information Manual*.

If the rack contains more than one PDB, use this MAP to test the PDB that is connected to the failing drawer. If you cannot determine which PDB is connected to the failing drawer, use this MAP to test the first PDB, and then test the other PDB until the problem is determined.

This procedure is used to locate power problems in the power distribution bus (PDB). If a problem is detected, this procedure will help you to isolate the problem to the failing field replaceable unit (FRU).

Observe the following safety notices during service procedures.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

Attention: This unit may have more than one power supply cord. To completely remove power, you must disconnect all power supply cords.

Step 1

If an uninterruptible power source (UPS) is installed, the power is off, and the LEDs on the power distribution bus (PDB) are off, unplug the customer's power cord from the UPS, and then plug the customer's power cord into the PDB.

Are the LEDs on the PDB on?

NO Check the customer's power cord for continuity from the wall outlet to the PDB or UPS, and then go to Step 2.

YES Refer to the maintenance and diagnostic information in the UPS service documentation (provided with the UPS), and then replace the UPS if necessary; go to Step 17.

Step 2

(from Step 1)

The green LEDs located on the power distribution bus indicate that power is supplied from the customer's outlet, through the customer's power cable, and to the power distribution bus.

Are all of the LEDs on the power distribution bus on?

NO Check the customer's outlet for the correct voltage, and then check the customer's power cord for continuity. If both are correct, exchange the power distribution bus, and then go to Step 15.

YES Go to Step 3.

Step 3

(from Step 2)

1. Record the locations of all drawer power cords that are plugged into the power distribution bus, and then unplug all of the power cords from the PDB.
2. Plug the CPU Enclosure power cable into the original outlet on the power distribution bus.
3. Set the key mode switch to the Service position.
4. Set the power button located on the CPU enclosure to on (button pushed in).

Did the CPU Enclosure Power light come on and stay on?

NO Go to Step 4.

YES Go to Step 8.

Step 4

(from Step 3)

Did the drawer power reset CB on the power distribution bus go to the Off position (pop out)?

NO Go to Step 5.

YES Go to Step 7.

Step 5

(from Step 4)

1. Plug the CPU Enclosure power cable into another outlet on the power distribution bus.
2. Set the power button located on the CPU enclosure to on (button pushed in).

Did the CPU Enclosure Power light come on and stay on?

NO Go to Step 6.

YES The first outlet is defective. Use the second outlet, or exchange the power distribution bus, and then go to Step 17.

Step 6

(from Step 5)

1. Plug the power cable of another drawer into the same outlet.
2. Switch on power to the drawer.

The green light near the AC plug on the rear of some drawers indicates only that power is reaching the drawer and not that the power supply is operating.

Did the drawer Power light come on and stay on, or are the fans operating?

NO Exchange the power distribution bus, and then go to Step 17.

YES Depending on the system unit installed in your rack, go to "MAP 1520: Power MAP" in either the *7015 POWERserver CPU Drawer Service Guide* or the *7015 POWERserver CPU Enclosure Service Guide*.

Step 7

(from Step 4)

1. Plug the CPU Enclosure power cable into another outlet on the power distribution bus.
2. Set the power button to on (button pushed in).

Did the circuit breaker go to the Off position (pop out)?

NO The first circuit breaker is probably defective. Use the second outlet, or exchange the power distribution bus, and then go to Step 17.

YES The drawer is overloading the circuit breaker. Exchange the CPU Enclosure power cable or power supply, and then go to Step 17.

Step 8

(from Step 3)

1. Plug the power cable of another drawer into an outlet on the power distribution bus.
2. Switch on power to the drawer.

Did the Power light come on and stay on, or are the fans operating?

NO	Go to Step 9.
YES	Repeat this step until power is on in all of the drawers, and then continue with Step 10.

Step 9

(from Step 8)

1. Switch off power to the drawer.
2. Plug the power cable into another outlet on the power distribution bus.
3. Switch on power to the drawer.

Did the Power light come on and stay on, or are the fans operating?

NO	Go to the power MAP for this drawer (located in the service guide for the drawer).
YES	The first circuit breaker is probably defective. Use the second outlet, or exchange the power distribution bus, and then go to Step 17.

Step 10

(from Step 8)

Note: If your system is a high availability system, all PCI cables going to the CPU Enclosure must be disconnected.

All of the drawers are working correctly. Use the following steps to check the network that controls power to the drawers.

The power control system uses power control interface (PCI) cables (connected in series between the drawers) to control power to the drawers or at the drawers.

The DC output at each drawer power supply can be switched on and off if power is available at the drawer power input.

Attention: You will switch off power to a drawer that is operating if you connect a PCI cable to that drawer.

1. Press the Power Off button.
2. On the 7015 CPU Enclosure, connect a PCI cable from connector J210 or J211 to connector J19 or J20 of a disk drive drawer.
3. Press the Power On button, and then press the Power Off button.

Did the drawer that you connected switch on and off?

NO Go to Step 11.

YES Repeat this step for all of the drawers that have PCI cables connected to them, and then go to Step 15.

Step 11

(from Step 10)

1. Use a different PCI cable to connect the CPU Enclosure to the async or a disk drive drawer used in Step 10.
2. Press the Power On button, and then press the Power Off button.

Did the drawer that you connected switch on and off?

NO Go to Step 12.

YES Exchange the defective PCI cable, and then go to Step 15.

Step 12

(from Step 11)

Is there another SCSI device or async drawer installed that has a PCI connector?

NO Go to Step 13.

YES Go to Step 14.

Step 13

(from Step 12)

There is a problem with either the CPU Enclosure or the drawer. Exchange the following FRUs in the order listed below:

- Drawer power supply
- CPU Enclosure operator panel
- CPU Enclosure power supply

1. After exchanging each of the FRUs, reconnect all power and PCI cables to the connectors from which they were disconnected.
2. Power-on the system, and then power-off the system.

Did all of the drawers switch on and off?

NO	Repeat this step using the next FRU.
YES	Go to Step 17.

Step 14

(from Step 12)

1. Disconnect the PCI cable from the async or SCSI device drawer, and then connect it to the drawer you identified in Step 12.
2. Power on the system, and then power off the system.

Did the drawer switch on and then switch off?

NO	The CPU Enclosure is not producing a power control signal. Exchange the CPU Enclosure operator panel or power supply, and then go to Step 15.
YES	The async or SCSI device drawer you were using in Step 11 did not detect the power control signal. Exchange the power supply of the drawer, and then go to Step 15.

Step 15

(from Steps 2, 10, 11 and 14)

1. Press the Power Off button.
2. Reconnect all of the PCI cables to the connectors from which they were disconnected.
3. Press the Power On button.

Did all of the drawers switch on?

NO	Go to Step 16.
YES	Go to Step 17.

Step 16

(from Step 15)

Did some of the drawers switch on?

NO Exchange the CPU Enclosure operator panel, PCI cables, or power distribution bus, and then go to Step 17.

YES Exchange the PCI cable or power supply of the drawer that did not switch on, or exchange the power distribution bus. After you exchange the part, go to Step 17.

Step 17

(from Steps 1, 5, 6, 7, 9, 13, 15, and 16)

1. Press the Power Off button.
2. Connect all PCI cables to their original connectors.
3. Connect all drawer power cables to their original power outlets on the power distribution bus.
4. This completes the repair. Go to "MAP 0410: Repair Checkout" in the *POWERstation and POWERserver Common Diagnostics Information Manual*.

Chapter 4. Removal and Replacement (AC Rack)

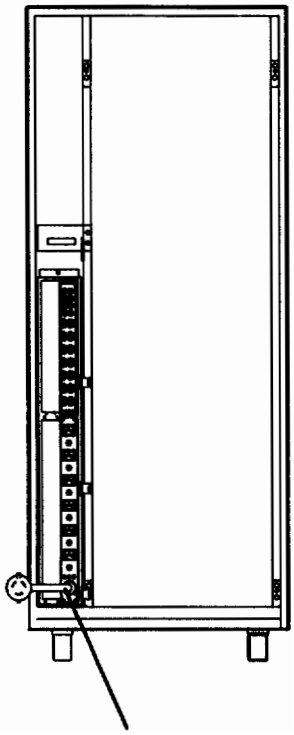
This chapter contains information about powering the system on and off, and removing and replacing devices.

The information contained in this chapter explains how to perform removal and replacement procedures with an AC rack.

For information about removal and replacement procedures with a –48 V dc rack, refer to Chapter 5.

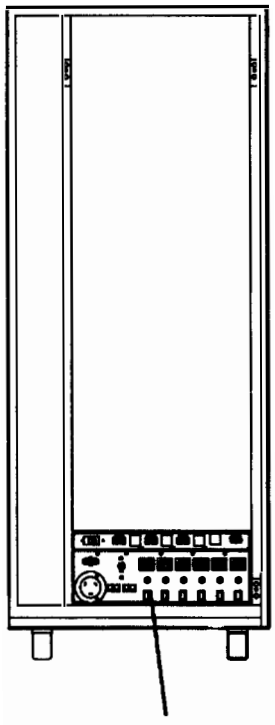
The following illustration shows the two types of power distribution systems available in the Model R00 rack. Use the correct power-on and power-off procedure for the power distribution system in your rack.

Rear View of Rack with Power Distribution Bus



Power Distribution Bus (In AC Rack)

Rear View of Rack with Power Distribution Unit

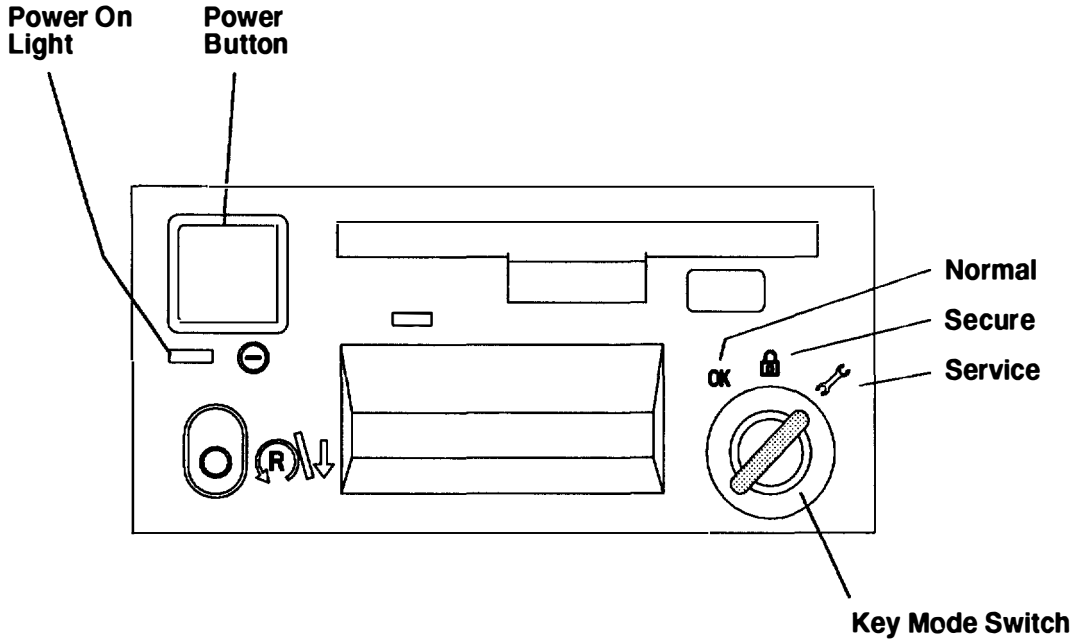


Power Distribution Unit (In AC Rack)

Power-On Procedure with Power Distribution Bus

Note: Ensure that the key mode switch is set to the Service position to prevent system unit power from being switched on unexpectedly.

1. Set the key mode switch to the Service position.



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

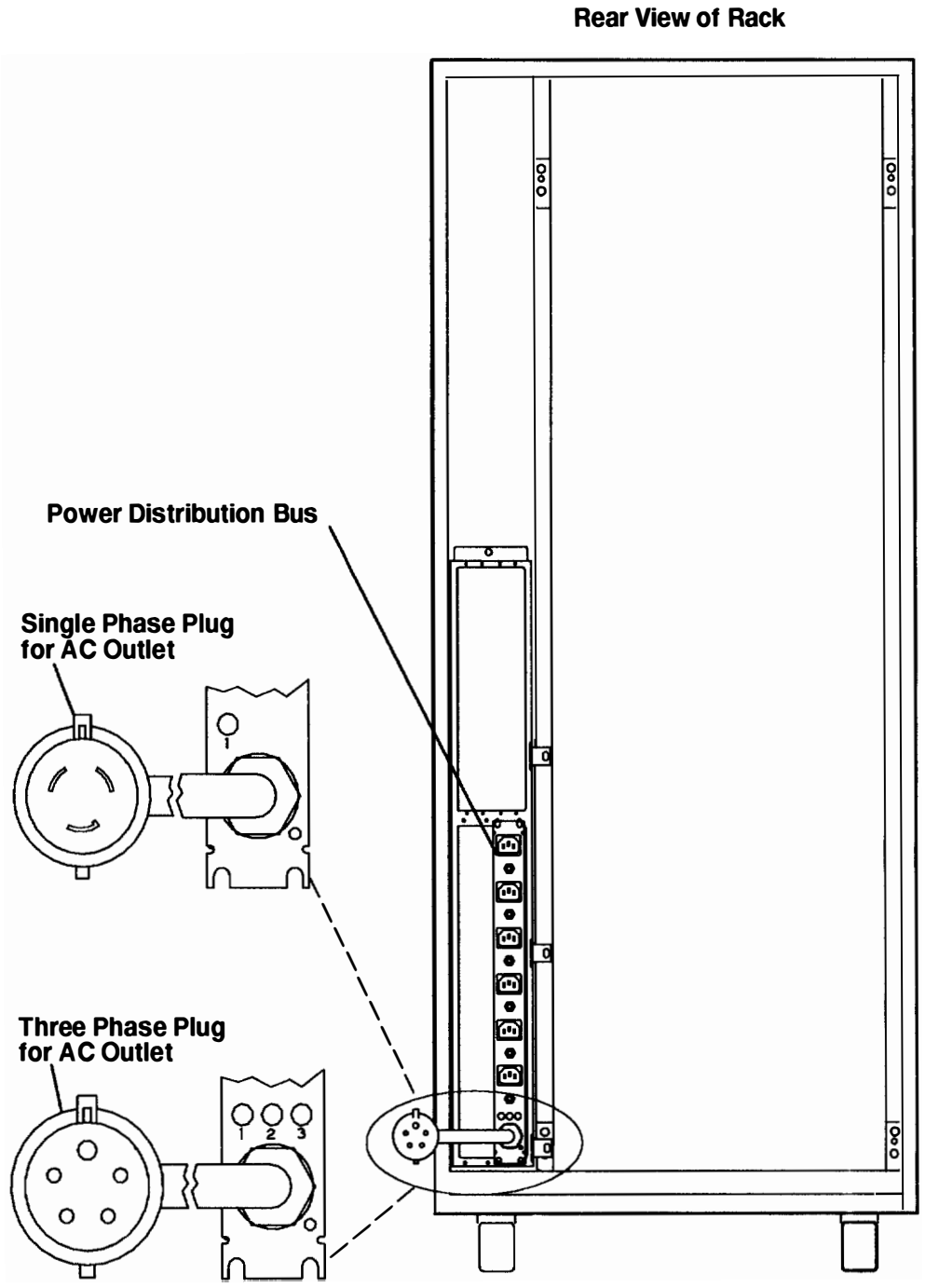
Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors, for communications lines.

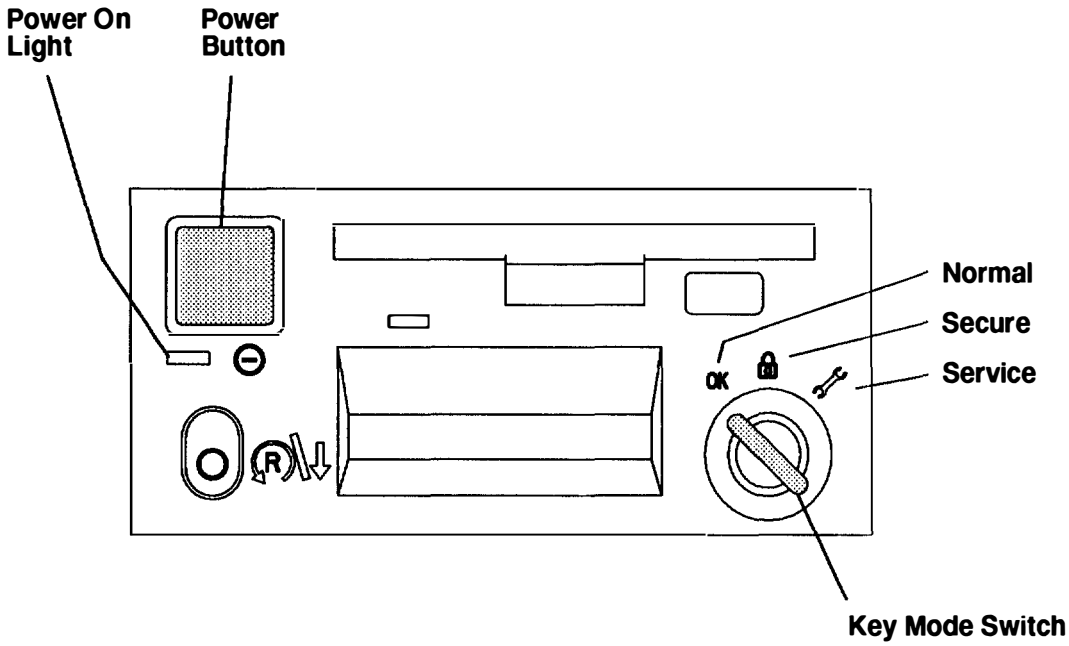
CAUTION:
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Note: If two PDBs are installed in the rack, plug the power cords of both PDBs into the electrical outlets.

2. Plug the power cord for the power distribution bus into the electrical wall outlet.



3. Plug all drawer power cords into the outlets on the PDB.
4. Switch on power to all drawers connected to the PDB.
5. Close the back door of the rack.
6. Set the key mode switch to the Normal position.
7. Set the Power button to on (button pushed in).

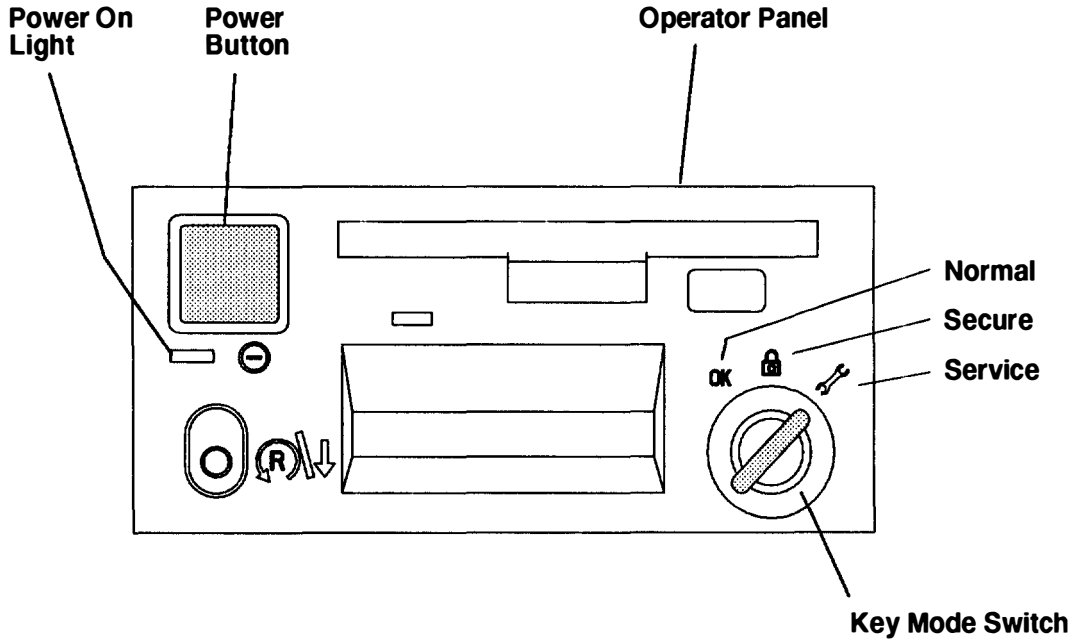


Power-Off Procedure with Power Distribution Bus

Note: Before powering off the drawers or external devices, ask the customer about their system high availability requirements.

Attention: Use the appropriate **shutdown** command before you stop the system unit; failure to do so may result in the loss of data. See your operating system documentation for information about the **shutdown** command.

1. Set the key mode switch to the Service position.
2. Set the Power button on the operator panel to off (button in the out position).



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or stations protectors, for communications lines.

CAUTION:
This unit has more than one power supply cord. To completely remove power, you must disconnect two power supply cords.

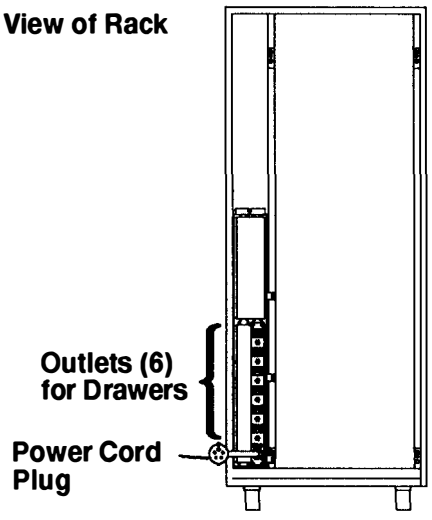
Note: Because many drawers or external devices can be connected to the system unit, it may be impractical for you to switch off power to all the drawers or devices and unplug their power cords.

3. Open the rear door of the rack.

Note: If two power distribution buses (PDB) are installed in your rack and you are servicing only one of the PDBs, power-off the drawers connected to the PDB you are servicing, and then connect those drawer power cords to the second PDB. If the second PDB is not being serviced, you may want to power-on the drawers that you just connected to the second PDB.

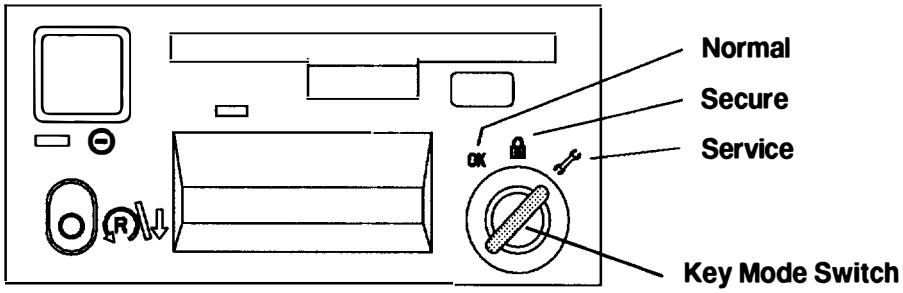
4. Switch off power to all drawers or external devices that are connected to the power distribution bus (PDB) you are servicing.
5. Unplug the drawer or device power cords from the electrical outlets on the PDB you are servicing.
6. If drawer or device power cords are not connected to the PDB you are servicing, unplug the PDB power cord from the electrical line cord.

Rear View of Rack



Power-On Procedure with PDU

1. Set the key mode switch to the Service position.



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors, for communications lines.

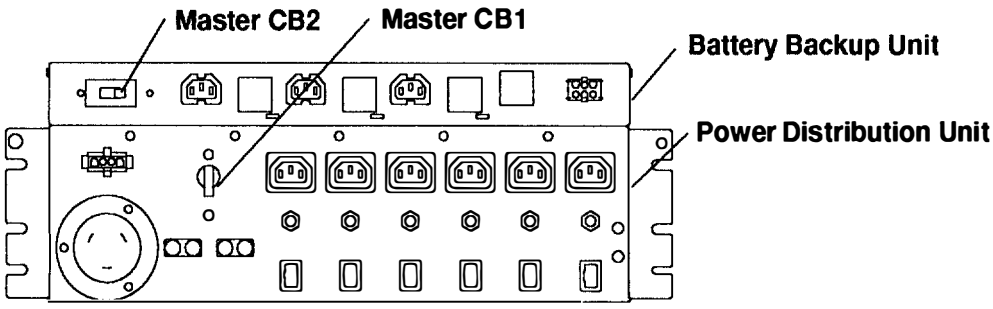
CAUTION:

This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

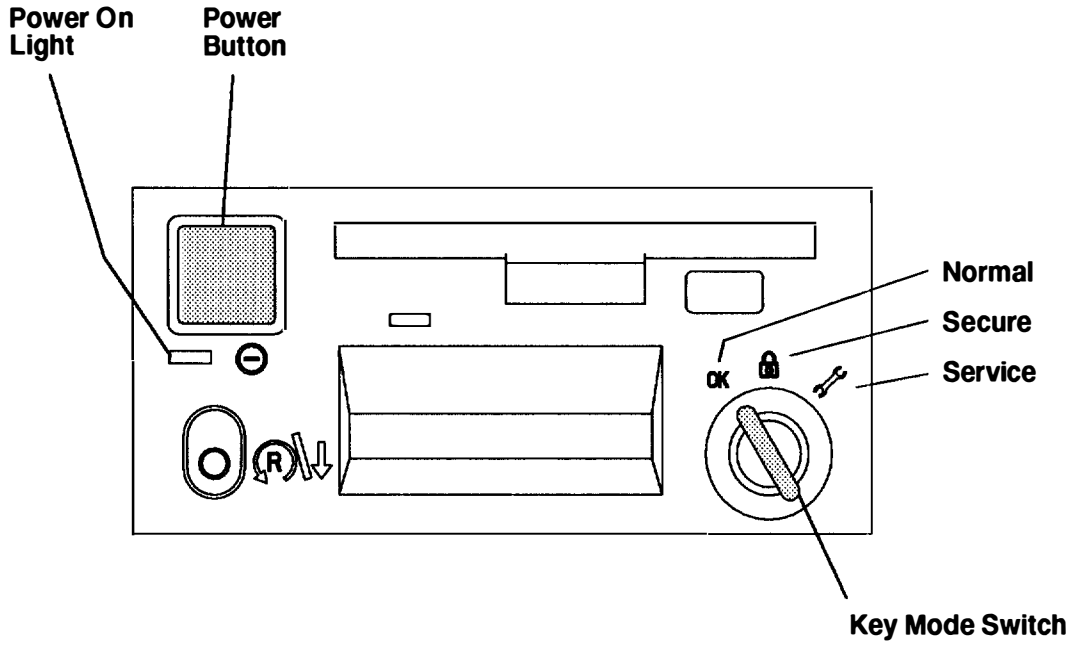
2. Plug the system-unit power cord into the electrical outlet.
3. If the battery backup unit is installed, set the Master CB2 circuit breaker to On.

Note: Ensure that the key mode switch is set to the Service position to prevent system unit power from being switched on unexpectedly.

4. Set the Master CB1 circuit breaker to On.



5. Close the back door of the system unit.
6. Plug all external device power cords into the electrical outlets.
7. Switch on power to all external devices attached to the system unit.
8. Set the key mode switch to the Normal position.
9. Set the Power button on the operator panel to on (button pushed in).

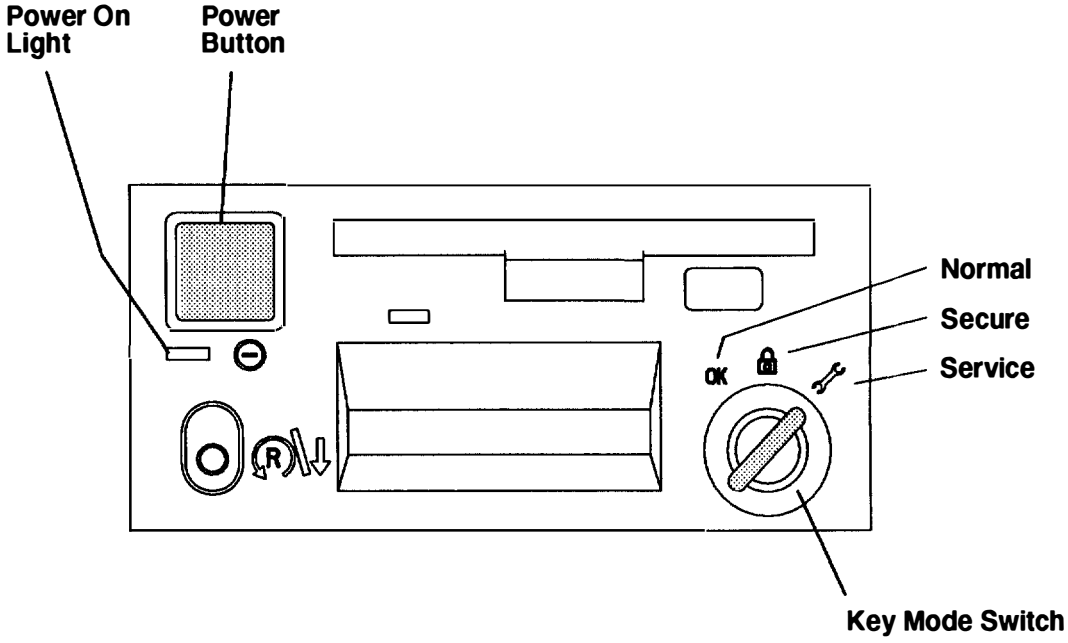


Power-Off Procedure with Power Distribution Unit

Note: Before stopping the system unit, you must first shut down the operating system to prevent losing data.

Attention: Use the appropriate **shutdown** command before you stop the system unit; failure to do so may result in the loss of data. See your operating system documentation for information about the **shutdown** command.

1. Set the key mode switch to the Service position.
2. Set the Power button to off (button in the out position).



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

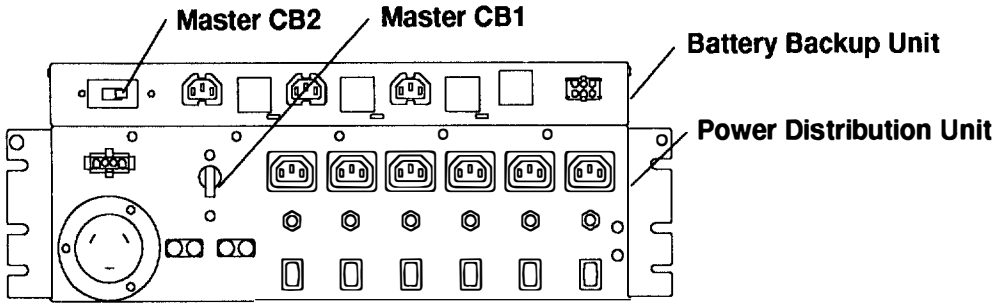
During an electrical storm, do not connect cables for display stations, printers, telephones, or stations protectors, for communications lines.

Attention: To completely remove power, you must disconnect all power supply cords.

3. Switch off power to all external devices attached to the system unit, and then unplug the device power cords from the electrical outlets.

Note: Because a large number of external devices can be connected to the system unit, it may be impractical for you to switch off power to all the devices and unplug their power cords.

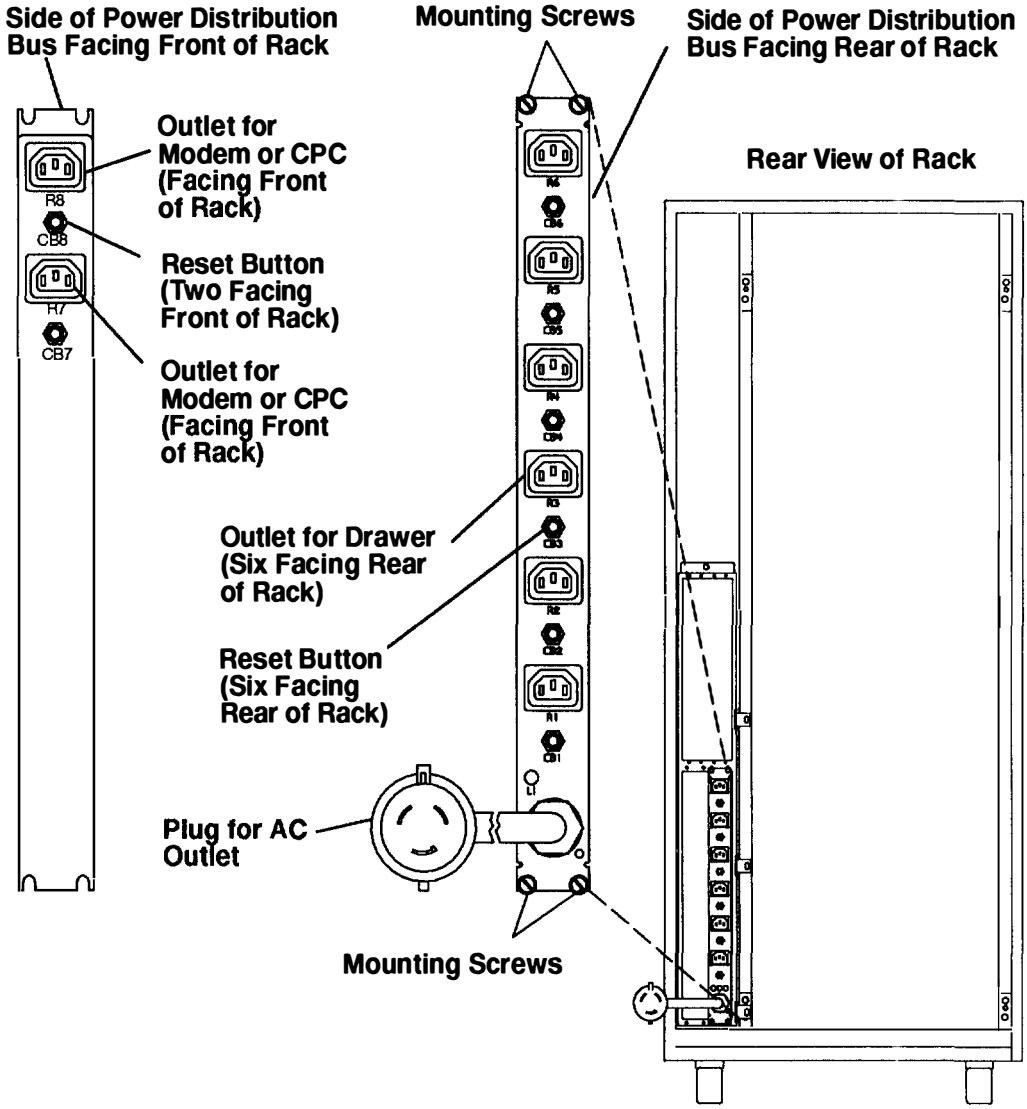
4. Open the rear door of the system unit.
5. Set the Master CB1 circuit breaker to Off.
6. If the battery backup unit is installed, set the Master CB2 circuit breaker to Off.
7. Unless you are servicing the system while signal cables or power cords are connected to external devices, unplug the system unit power cord from the electrical outlet.



Power Distribution Bus

Removal

1. Do the "Power-Off Procedure with Power Distribution Bus" on page 4-6.
2. Record the locations of the drawer power cords plugged into the power connectors on the power distribution bus, and then unplug the drawer power cords.
3. Remove the four mounting screws from the PDB, and then pull the PDB toward you to access the modem and cluster power control (CPC) power cords plugged into the two power connectors on the other side of the PDB.
4. Unplug the modem and CPC power cords from the two power connectors on the side of the PDB facing the front of the rack, and then remove the PDB.



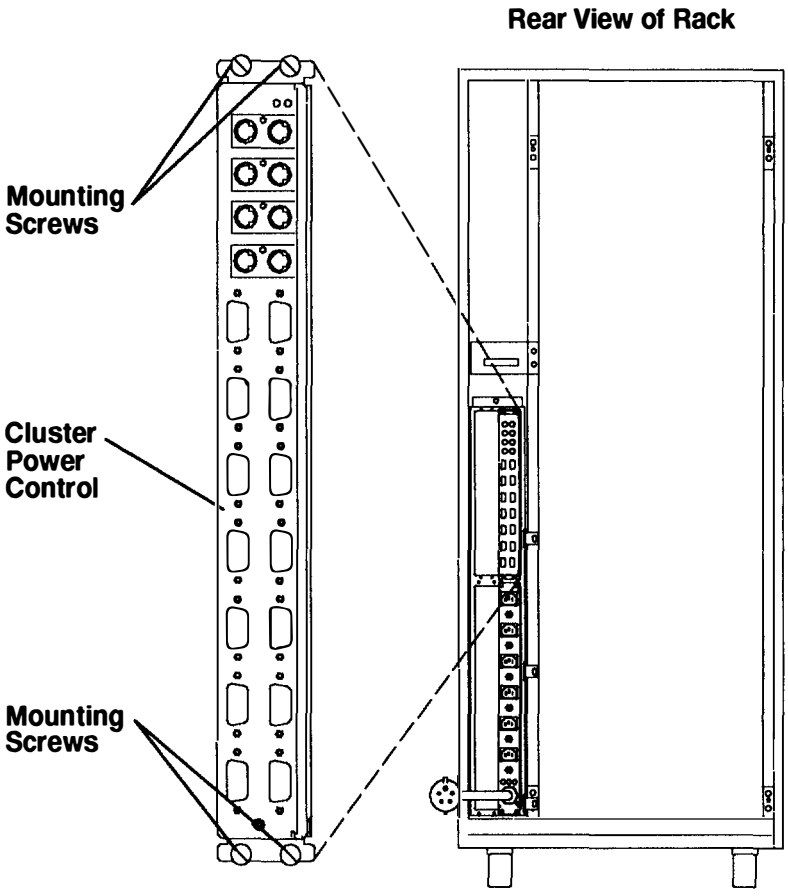
Replacement

Replace in the reverse order. Be sure to set the switches and plug the power cords into the locations that you recorded during the removal procedure, and then do the "Power-On Procedure with Power Distribution Bus" on page 4-2.

Cluster Power Control

Removal

1. Do the "Power-Off Procedure with Power Distribution Bus" on page 4-6.
2. Disconnect the power cord from the rear of the cluster power control (CPC).
3. Record the location of all cables attached to the CPC, and then disconnect all of the cables from the CPC.
4. Remove the four mounting screws, and then remove the CPC.



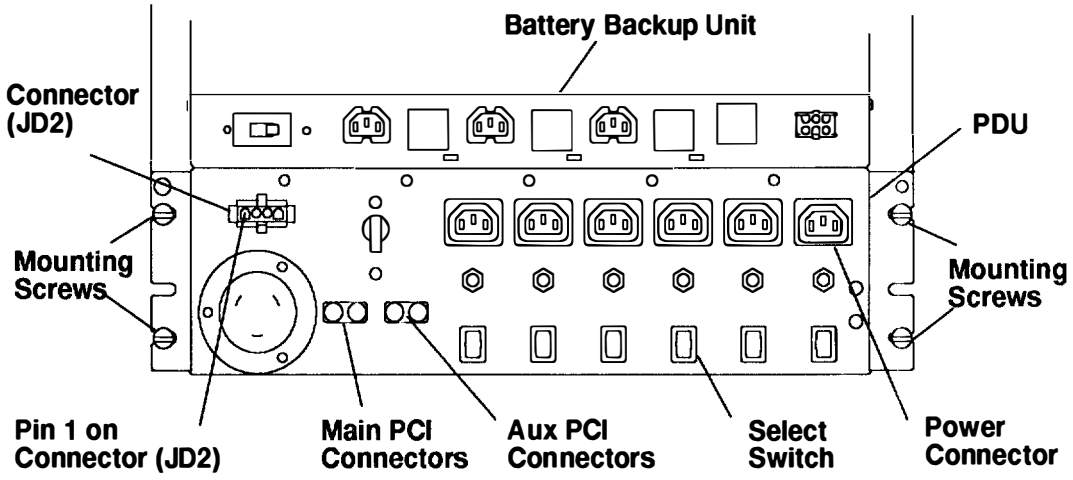
Replacement

Replace in the reverse order, and then do the "Power-On Procedure with Power Distribution Bus" on page 4-2.

Power Distribution Unit

Removal

1. Do the "Power-Off Procedure with Power Distribution Unit" on page 4-10.
2. Record the positions of the select switches.
3. Record the locations of the power cords plugged into the power connectors on the PDU, and then unplug the power cords.
4. Remove the power control cables from the main PCI connectors.
5. Remove the mounting screws from the PDU.
6. If the battery backup unit is installed, slide the BBU out 101 mm to 127 mm (4 to 5 inches) until it clears the PDU, and then remove the PDU. For information about sliding the BBU, refer to the "Battery and Battery Backup Unit" removal procedure on page 4-15.



Replacement

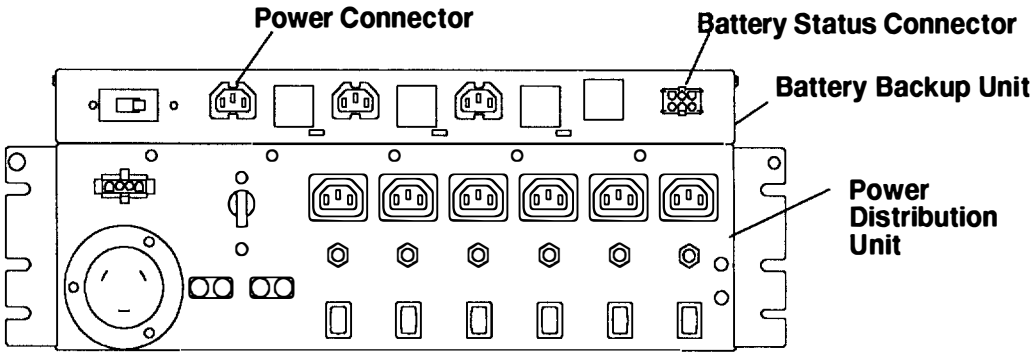
Replace in the reverse order. Be sure to set the switches and plug the power cords into the locations that you recorded during the removal procedure, and then do the "Power-On Procedure with PDU" on page 4-8.

Battery and Battery Backup Unit

Note: The battery backup unit is an optional device.

Removal

1. Do the "Power-Off Procedure with Power Distribution Unit" on page 4-10.
2. Unplug the battery status cable and all drawer power cords from the battery backup unit (BBU).



3. Grasp the sides of the BBU front cover, and then pull the cover away from the unit.
4. Remove the retaining screws from the front of the BBU.

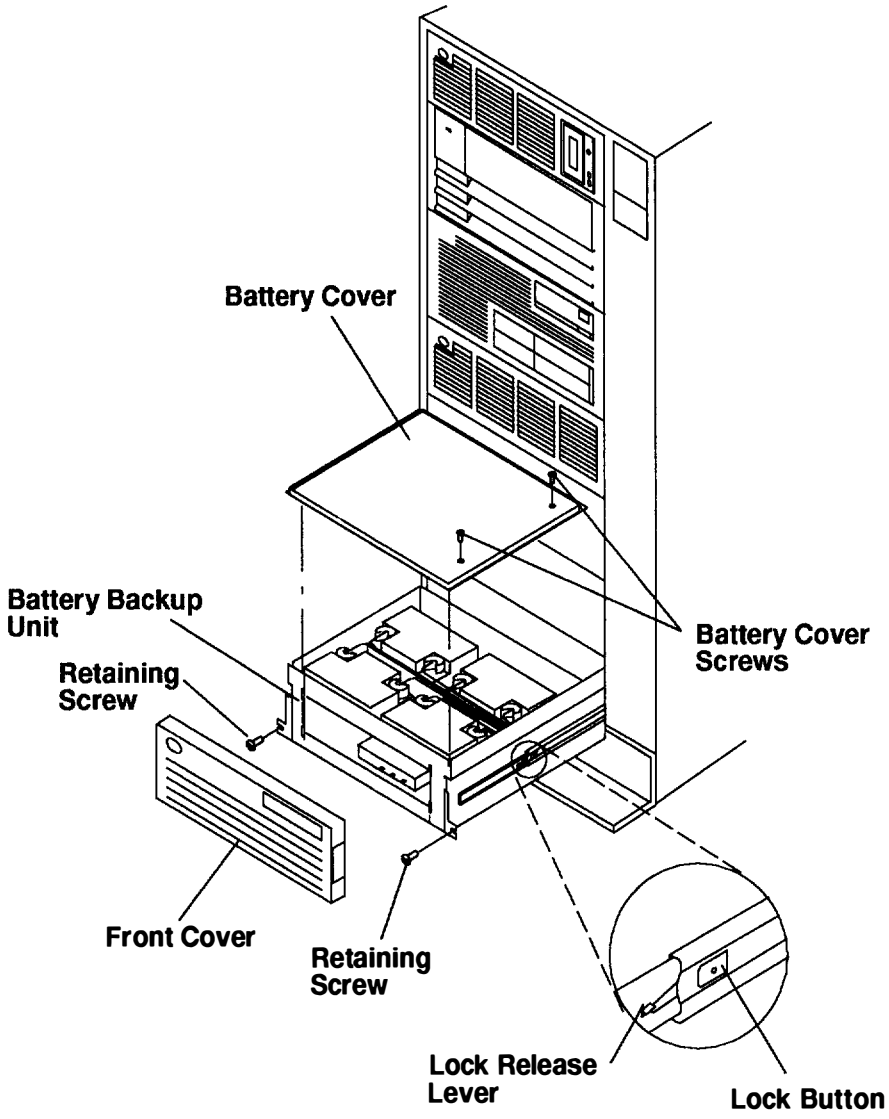
Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
When the drawer is extended, its weight can turn over a rack that is not steady. Before you pull the drawer out of the rack, ensure that a rack stabilizer is attached to the bottom front of the rack.

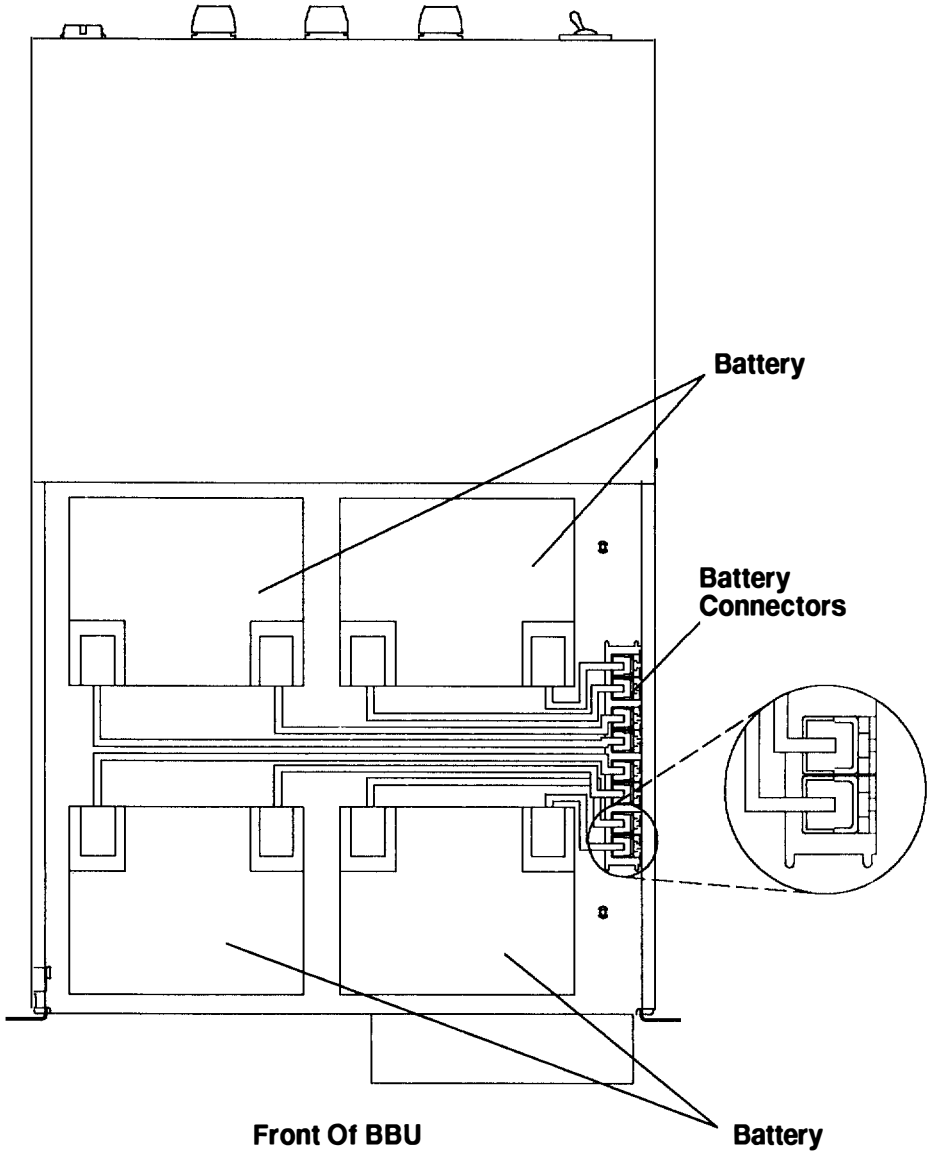
Do not pull out more than one drawer at a time. The rack can turn over if you pull out more than one drawer at a time.

Note: The rack must be either secured to the floor or the stabilizer must be firmly attached to the bottom-front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the rack is not secured to the floor or the stabilizer is not attached to the rack.

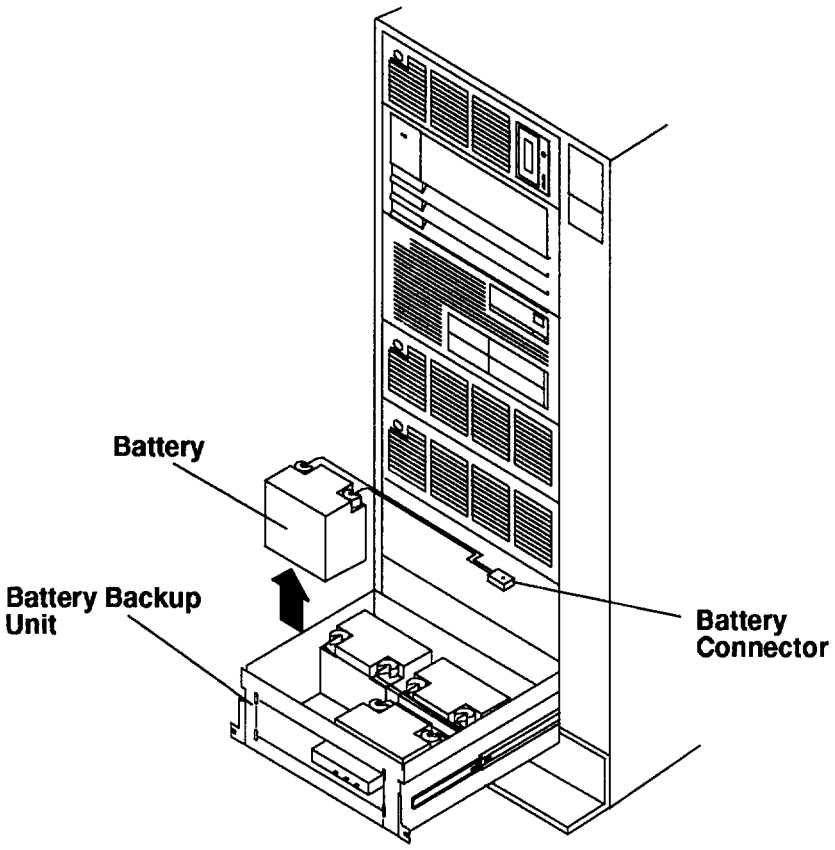
5. Pull the BBU out of the system unit until the lock buttons on the rails lock.
6. Remove the two battery cover screws, and then remove the battery cover.



7. Unplug the battery cables from the battery connectors in the BBU.



8. Remove the batteries one at a time.

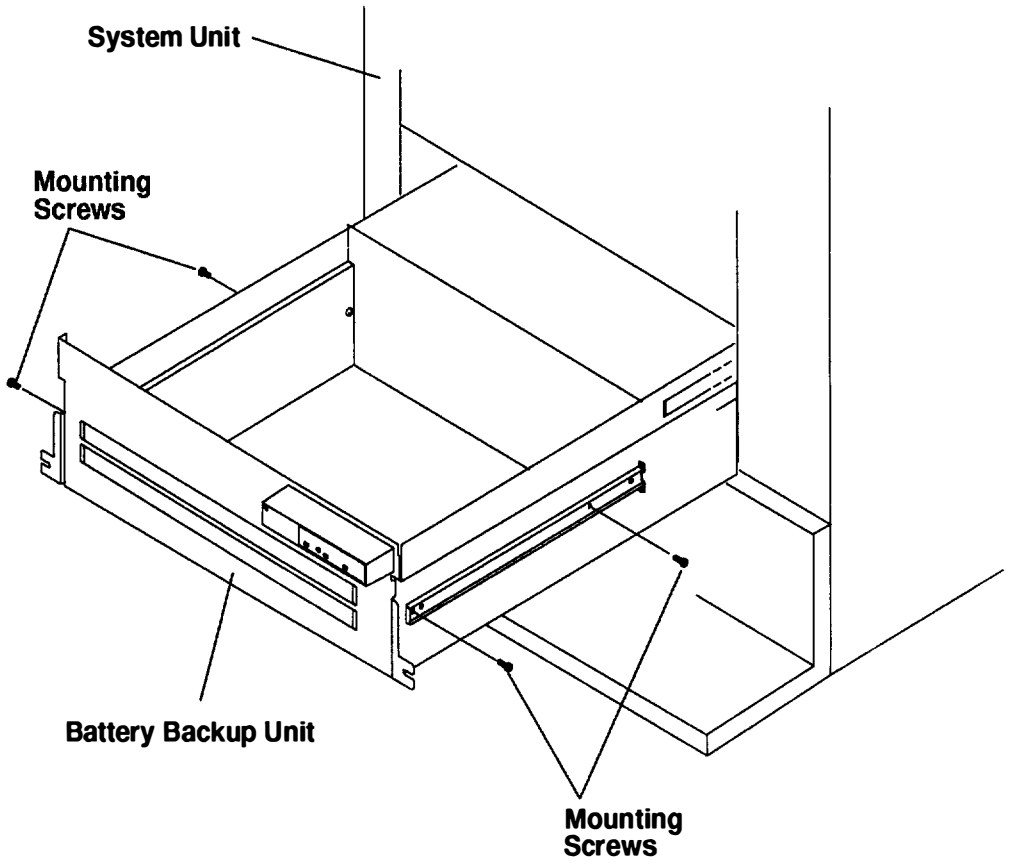


Note: For a translation of these notices, see the *System Unit Safety Information* manual.

CAUTION:
The battery connectors are polarized to prevent improper connection. Do not attempt to reverse the polarity. The connectors on the battery cables must be plugged only into the stationary receptacles provided. Plugging two battery cables together may cause sparking, overheating, or explosion.

CAUTION:
Do not incinerate. Dispose of the battery according to local regulations.

9. Remove the rail mounting screw from each side of the BBU, and then remove the BBU from the system unit.



Replacement

Replace in the reverse order. Make sure that the battery cables do not bind when they are plugged into the BBU. Do the "Power-On Procedure with Power Distribution Unit" on page 4-8.

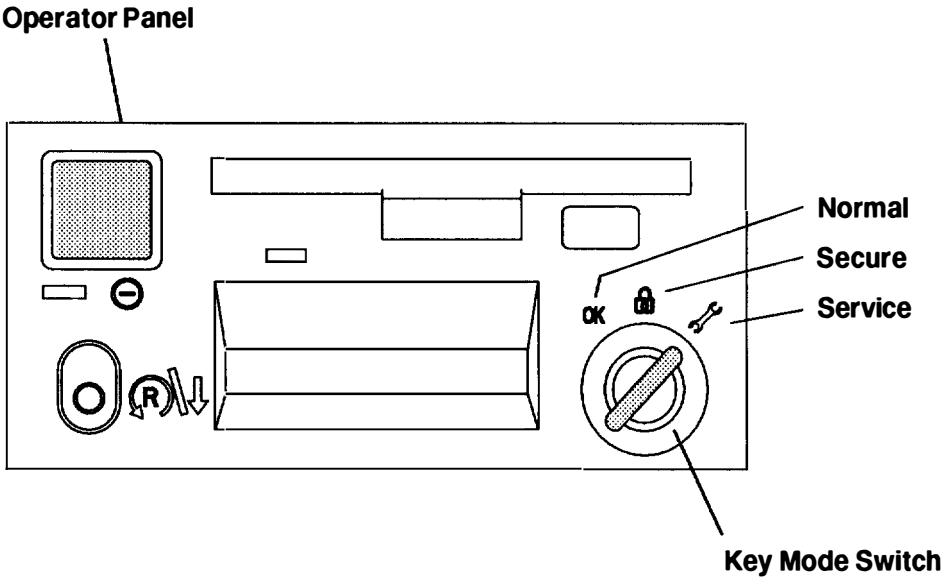
Chapter 5. Removal and Replacement (-48 V dc Rack)

This chapter contains information about removal and replacement procedures for the 7015 -48 V dc rack (containing a 7015 CPU-Media Enclosure).

For information about removal and replacement procedures for an AC 7015 rack, refer to Chapter 4.

Power-On Procedure with Power Distribution Panel

1. Set the key mode switch to the Service position.



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

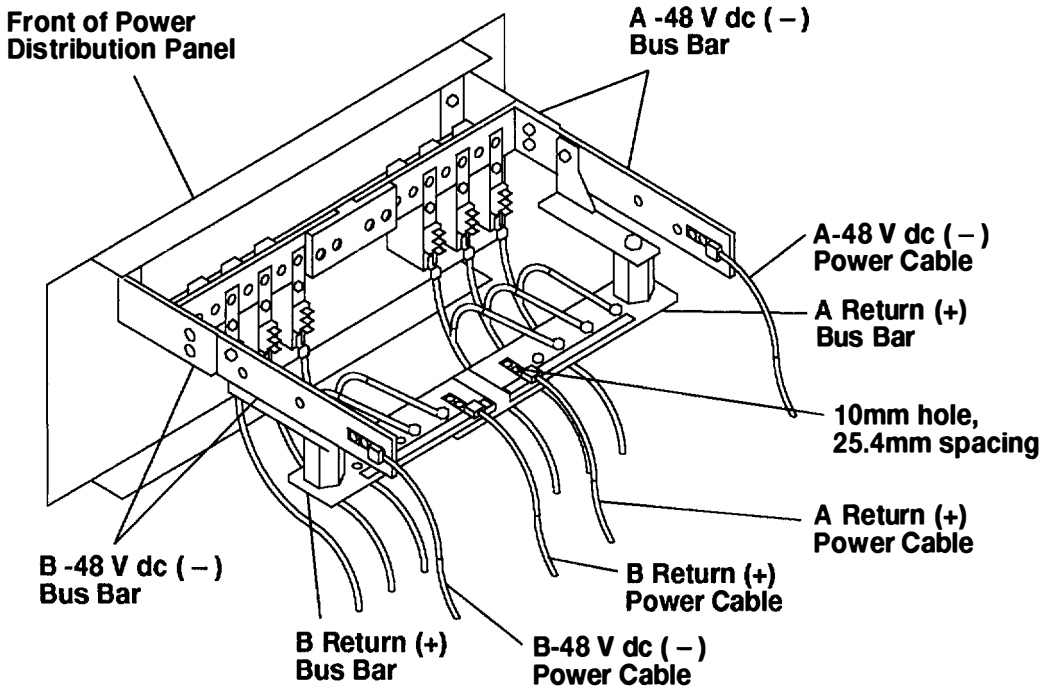
During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors, for communications lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

2. Ensure that the four power cables (-48 V dc (–) and return (+)) from each -48 V dc power source are connected to the power distribution panel.
3. Use a multimeter to ensure that -48 V dc power is entering the rack on both A & B side.

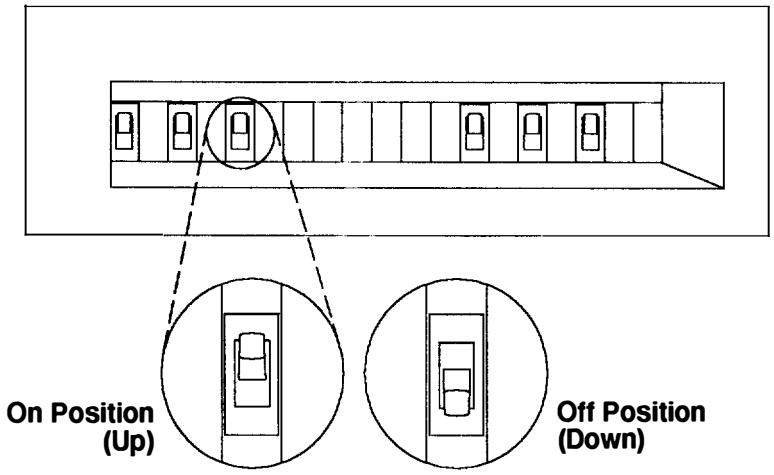
Notes:

1. An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.
2. The customer is responsible for providing and connecting power cables from the customer's -48 V dc power source to the power distribution panel.

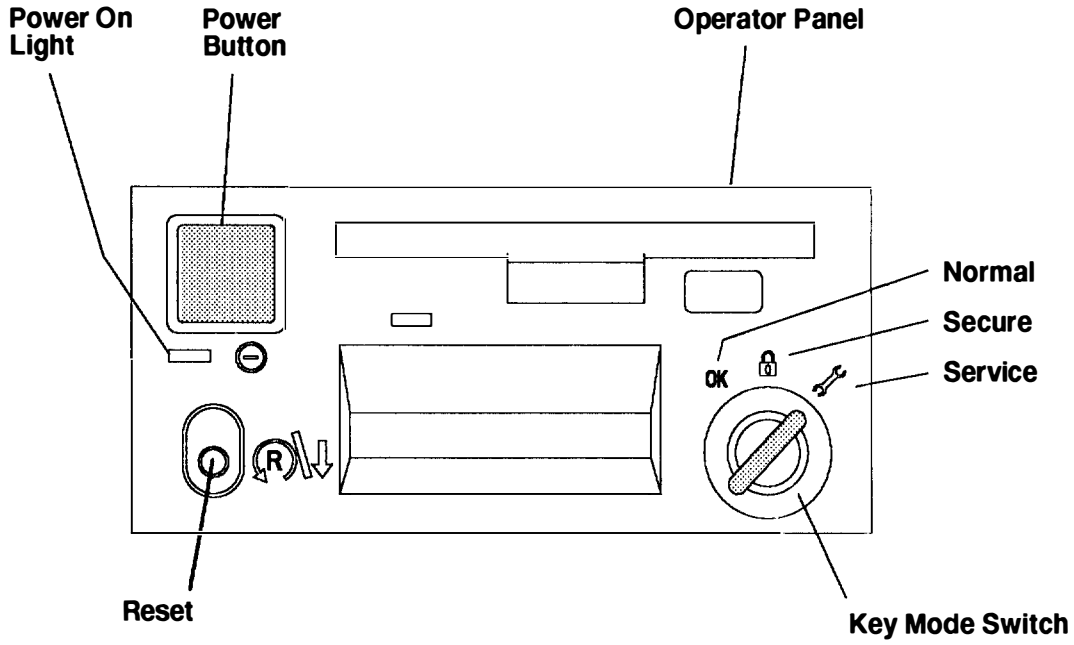


4. Ensure that all circuit breakers are on (circuit breaker switches in the up position).

Front View of Power Distribution Panel



5. Plug all external device power cords into the electrical outlets.
6. Switch on power to all external devices attached to the system unit.
7. Switch on power on all of the disk drive drawers.
8. Set the Power button to on (button pushed in).



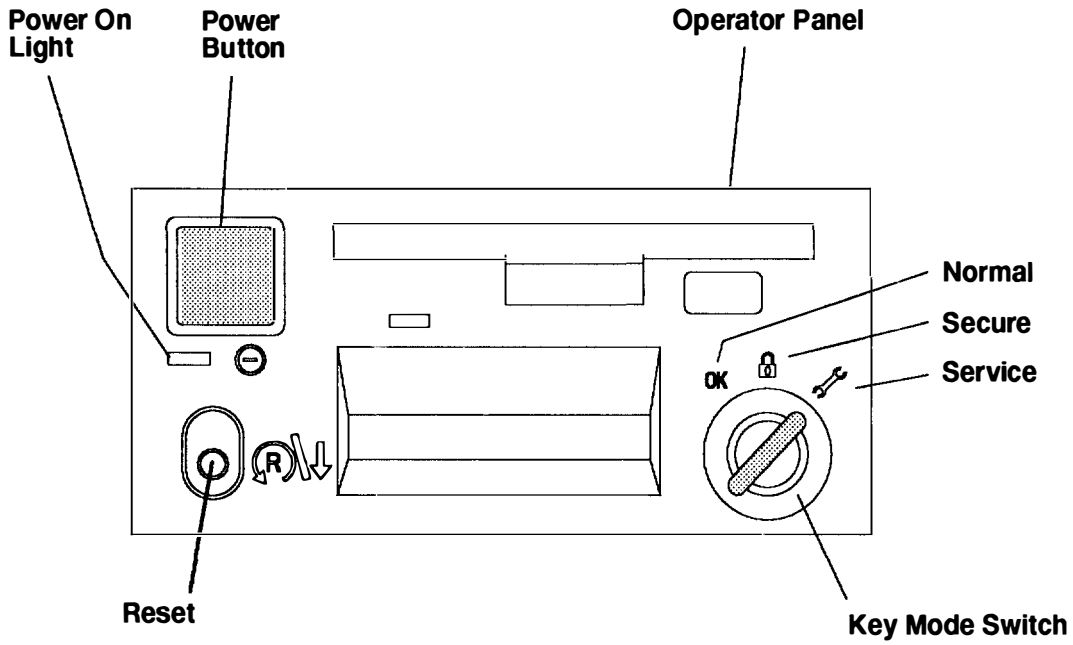
Power-Off Procedure with Power Distribution Panel

Note: Notify the customer if you are going to switch off power to any attached CPUs or drawers that are contained in this rack or any attached racks. Notify the customer that other attached systems might be affected by this procedure.

Note: Before stopping the system unit, you must first shut down the operating system to prevent losing data.

Attention: Use the appropriate **shutdown** command before you stop the system unit; failure to do so may result in the loss of data. See your operating system documentation for information about the **shutdown** command.

1. Set the key mode switch to the Service position.
2. Set the Power button to off (button in the out position).



Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or stations protectors, for communications lines.

3. Switch off power on all disk drive drawers in the rack.
4. Switch off power to all external devices attached to the system unit, and then unplug the device power cords from the electrical outlets.

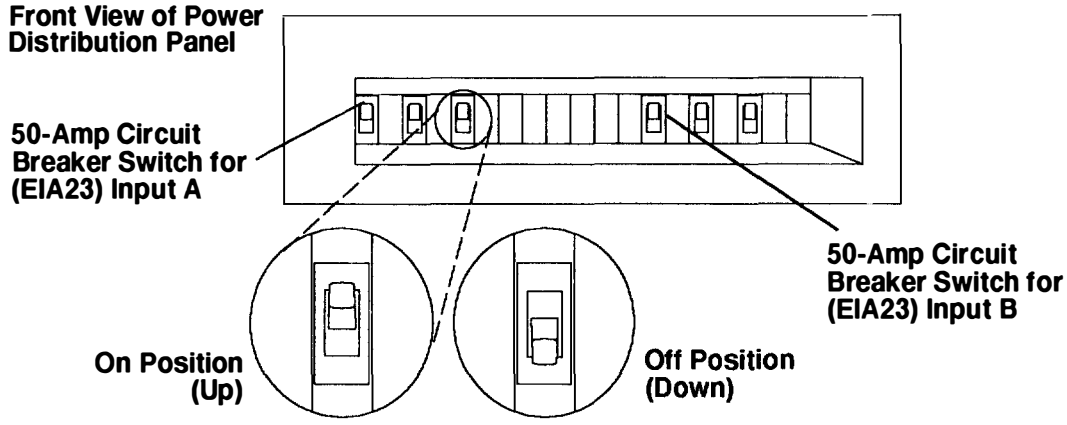
Note: If drawers in attached racks are connected to circuit breakers in this rack, power to the drawers in attached racks will be powered-off immediately when the controlling circuit breakers in this rack are set to off.

5. Except for circuit breakers in this rack that are connected to drawers in other racks, set all circuit breaker switches to the off position (down).

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Notes:

1. An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.
2. Because a large number of external devices can be connected to the system unit, it may be impractical for you to switch off power to all the devices and unplug their power cords.



Power Distribution Panel

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Note: An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.

Removal

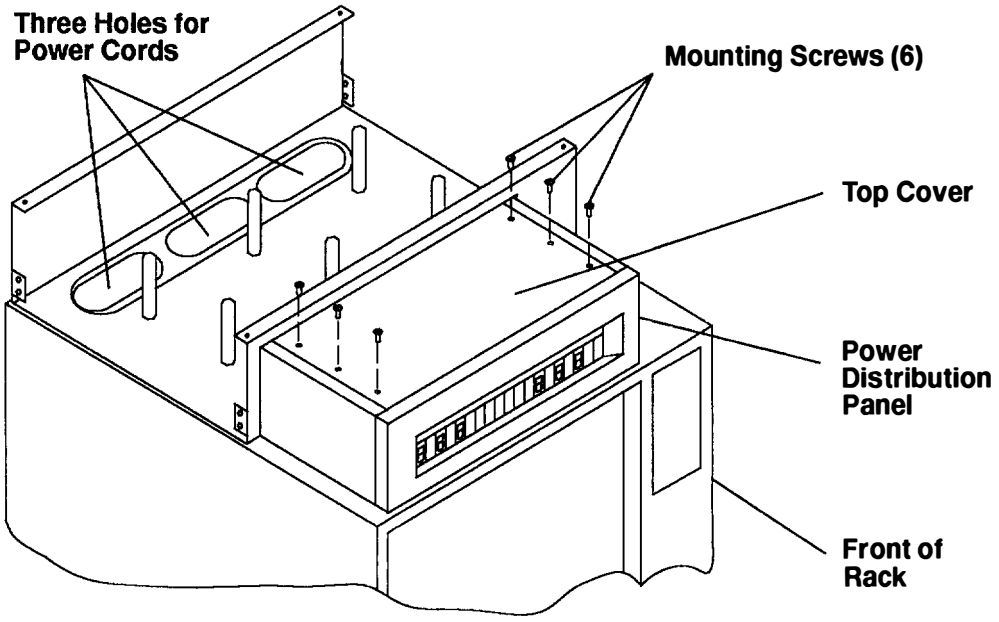
1. Do the "Power-Off Procedure With Power Distribution Panel" on page 5-4.

Note: Once the customer's -48 V dc power source is switched off, ensure that a tag or label is positioned over the switch to indicate that the power source is intended to be switched off.

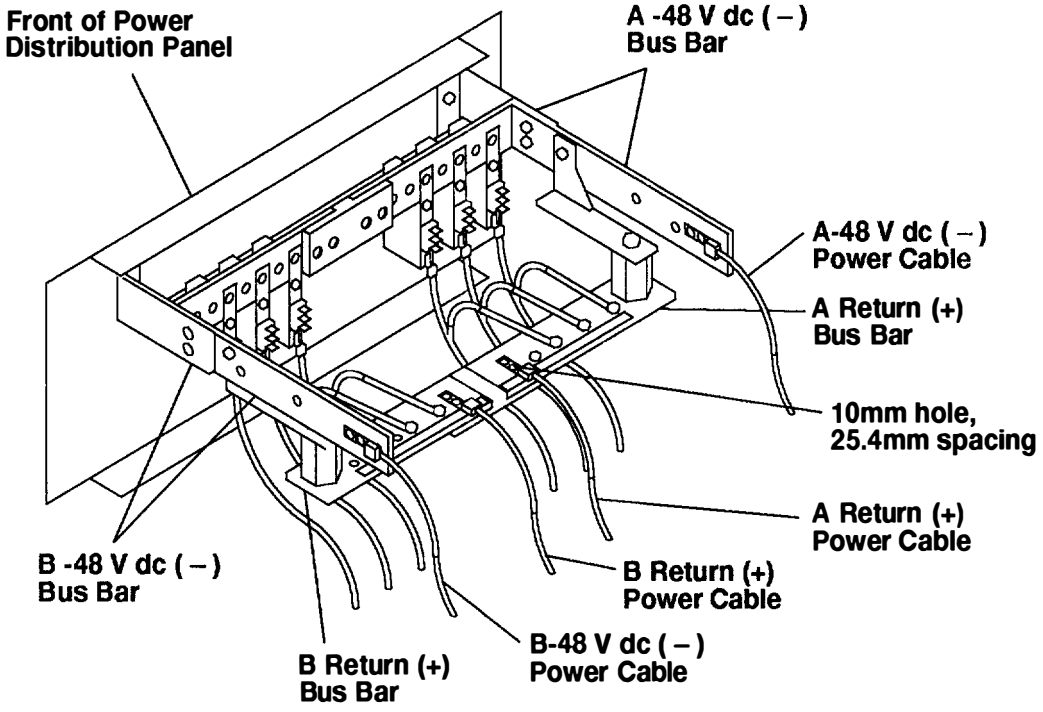
2. At the customer's -48 V dc power source, switch off power (from the -48 V dc power source to the power distribution panel (PDP)). Ensure that both power sources A and B are disconnected.

Note: Removing power to this PDP does not remove power to disk drive drawers in this rack that are being powered by a PDP of an attached rack.

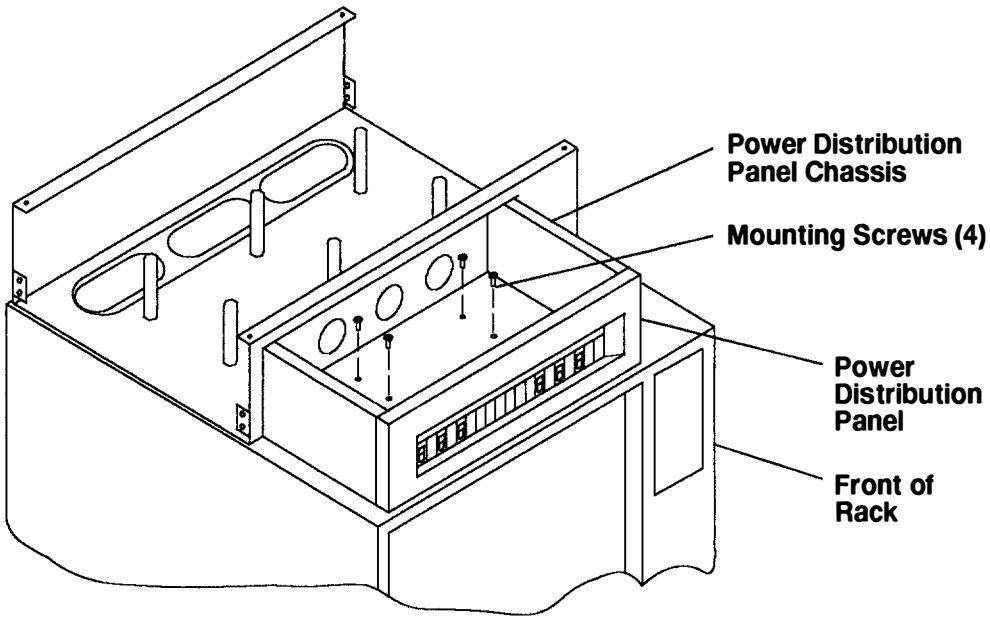
3. Disconnect all drawer power cords that are connected to the PDP, and then pull the power cords through the three holes in the top of the rack.
4. Remove the six mounting screws from the top cover of the PDP, and then remove the top cover.
5. Remove the insulator from the PDP.



6. With a multimeter, verify that no power exists between the two -48 V dc bus bars (–) and the two return bars (+).
7. Record the locations of the two -48 V dc power cables and the two return power cables.
8. Disconnect the two -48 V dc power cables from the two -48 V dc bus bars, and then remove cables from the PDP.
9. Disconnect the two return power cables, and then remove the cables from the PDP.



10. Remove the four mounting screws that attach the PDP chassis to the top of the rack.
11. Remove ground wire.
12. Remove the PDP and all of the attached drawer power cords from the top of the rack.



Replacement

Replace in the reverse order, and then do the "Power-On Procedure With Power Distribution Panel" on page 5-1.

Circuit Breaker

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Note: An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.

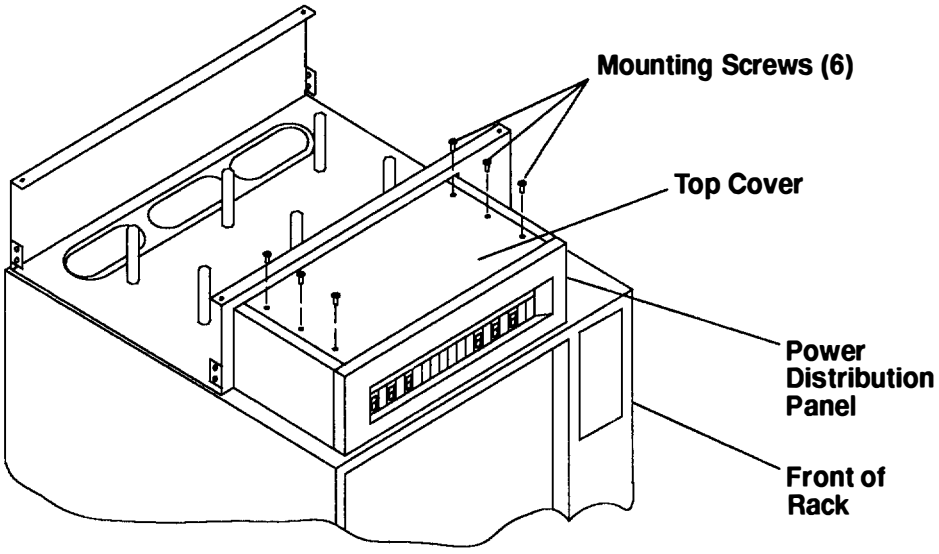
Removal

1. Do the "Power-Off Procedure With Power Distribution Panel" on page 5-4.

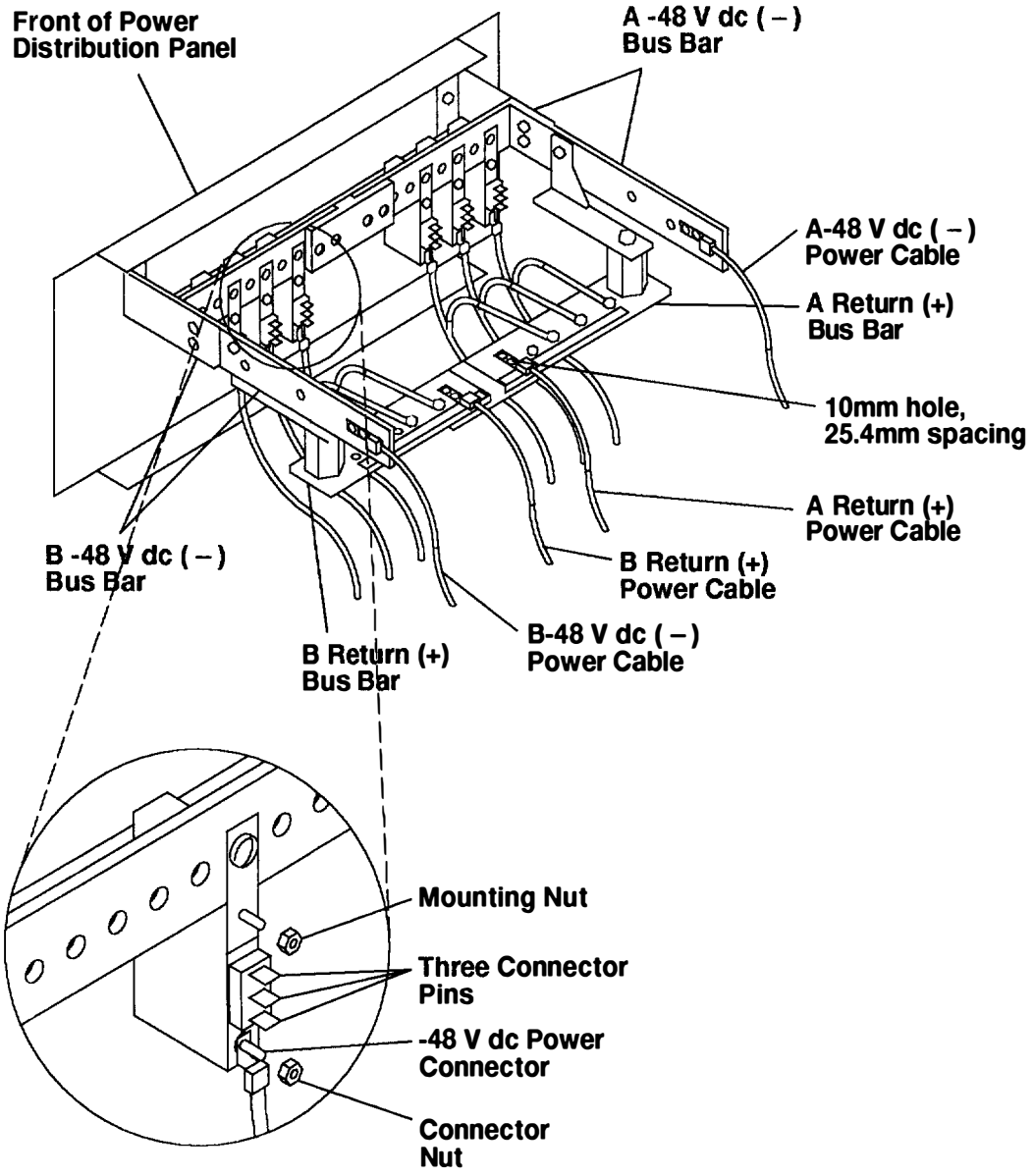
Note: Once the customer's -48 V dc power source is switched off, ensure that a tag or label is positioned over the switch to indicate that the power source is intended to be switched off.

2. At the customer's -48 V dc power source, switch off power (from the -48 V dc power source to the power distribution panel (PDP)). Ensure that both power sources A and B are disconnected.

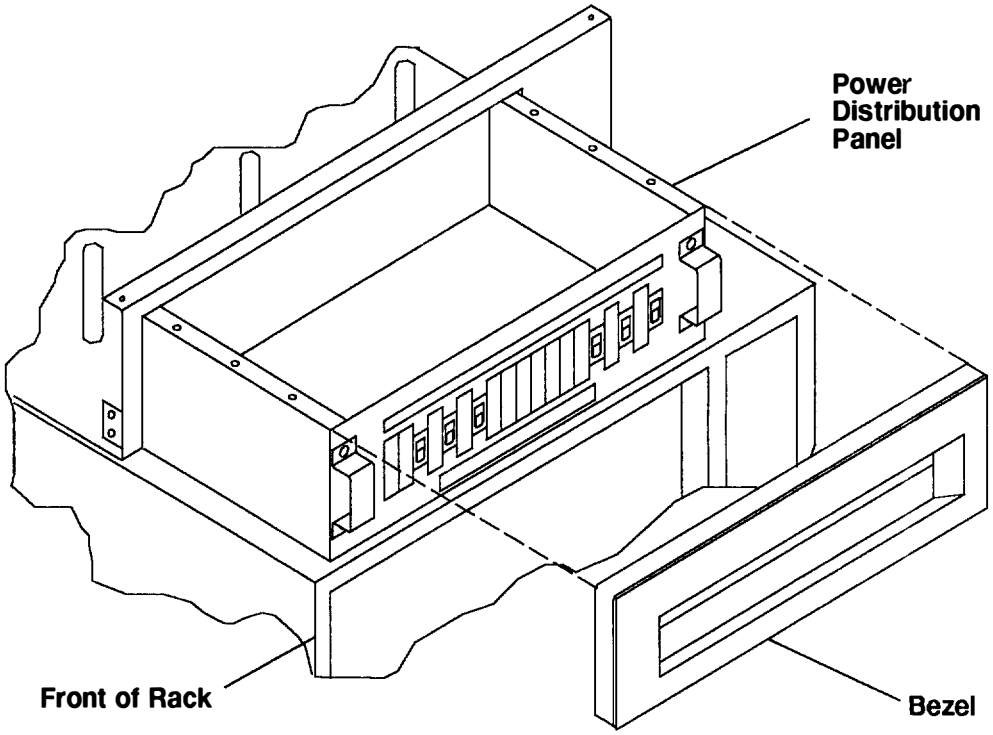
3. Remove the six mounting screws from the top cover of the PDP, and then remove the top cover.
4. Remove the insulator from the PDP.



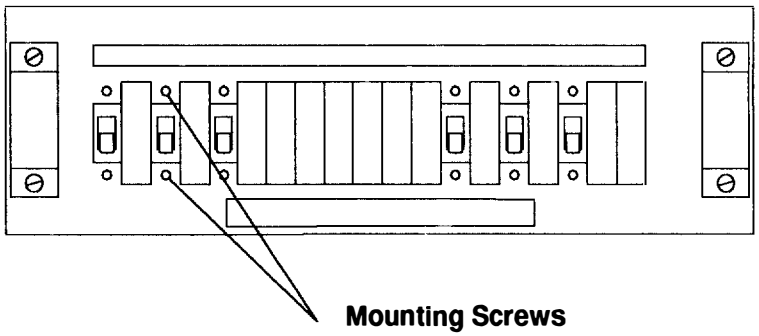
5. With a multimeter, verify that no power exists between each -48 V dc bus bar (–) and its return bar (+).
6. Record the locations of all cables or wires connected to the three connector pins on the circuit breaker and to the -48 V dc power connector.
7. Disconnect the three wires from the three connector pins.
8. Disconnect the -48 V dc power cable. To disconnect the -48 V dc power cable, remove the connector nut, and then remove the cable.
9. Disconnect the mounting nut attaching the rear of the circuit breaker in the PDP.



10. Remove the bezel by grasping the right and left side, and then firmly pulling the bezel away from the PDP.



11. Remove the two mounting screws holding the circuit breaker in the PDP, and then remove the circuit breaker from the inside of the PDP.



Front View of Power Distribution Panel (Without Bezel)

Replacement

Replace in the reverse order, and then do the "Power-On Procedure With Power Distribution Panel" on page 5-1.

Chapter 6. System Installation (AC Rack)

This chapter contains information about installing and preparing an AC 7015 rack for system operations.

For information about system installation on a –48 V dc rack, refer to Chapter 7.

Step 1. Inventory

Documentation

- ☐ The *About Your Machine* listing (In the plastic bag on the outside of the box)
- ☐ Labels for the Operator and Service Guides
- ☐ Operator Publications
  - *7015 Model R30 CPU Enclosure Operator Guide*
  - AIX Operating System publications
- ☐ Service Publications
  - *POWERstation and POWERserver Common Diagnostics Information Manual*
  - *7015 Model R30 CPU Enclosure Installation and Service Guide*

Miscellaneous Hardware and Diskettes

- ☐ Diagnostic CD-ROM Disc
- ☐ Microcode Diskettes (Quantity shipped may vary)
- ☐ Topology Diskettes (Quantity shipped may vary)
- ☐ Wrap Plugs and Container (Quantity shipped may vary)
- ☐ Cable Labeling Kit
- ☐ System Unit Power Cable
- ☐ Two 3-m (10-foot) 10-Pin to 25-Pin Converter Cables
- ☐ Two 3-m (10-foot) 25-Pin Serial Cables

Optional Items (Check if present)

- ☐ System Unit Keys

Step 2. Arranging the Books

__ The following items are related to the Operator Guide:

- All of the operator guides shipped for this system
- The problem solving guide
- The CD-ROM disc and microcode media (use holders as needed)
- Cable labeling kit.

__ The following items are related to the Service Guide:

- All of the service guides shipped for this system
- The common service information manual
- The topology diskettes (use holders as needed).

Step 3. Observe This Safety Notice during Installation

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Attention: This unit may have more than one power supply cord. To completely remove power, you must disconnect all power supply cords.

Step 4. Checking Customer Outlets

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
Do not touch the receptacle or the receptacle faceplate with anything other than your test probes before you have met the requirement in Step 8.

1. __ Have the customer locate and turn off the branch circuit CB (Circuit Breaker). (Attach tag S229-0237, which reads "Do Not Operate.")

Note: All measurements are made with the receptacle faceplate in the normal installed position.

2. __ Some receptacles are enclosed in metal housings. On receptacles of this type, perform the following steps:

   a. 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. Check for less than 1 volt from 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. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.

3. __ If any of the three checks made in substep 2 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.

Note: Do not use the digital multimeter to measure grounding resistance.

4. __ 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. __ Check for infinite resistance between the phase pins. This is a check for a wiring short.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
If the reading is other than infinity, do not proceed! Have the customer make necessary wiring corrections before continuing. Do not turn on the branch circuit CB until all the above steps are satisfactorily completed.

6. __ Have the customer turn on the branch circuit CB. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.

7. __ With an appropriate meter, verify that the voltage at the outlet is correct.

8. __ Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, C7106, or an appropriately approved ground impedance tester.

Note: Do not use the 120-volt convenience outlets inside a machine to power the tester.

Step 5. Setting Up the AC Rack

It is the customer's responsibility to unpack the system unit and place it where it is to be installed. If this has not been done, consult the customer and the marketing representative as necessary.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

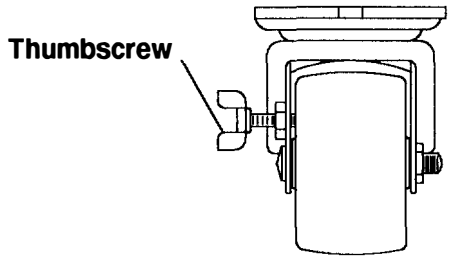
Note: The rack must be either secured to the floor or the stabilizer must be firmly attached to the bottom-front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the rack is not secured to the floor or the stabilizer is not attached to the rack.

1. Remove all packing and tape, if present, from the rack.
2. Position the rack according to the customer floor plan.

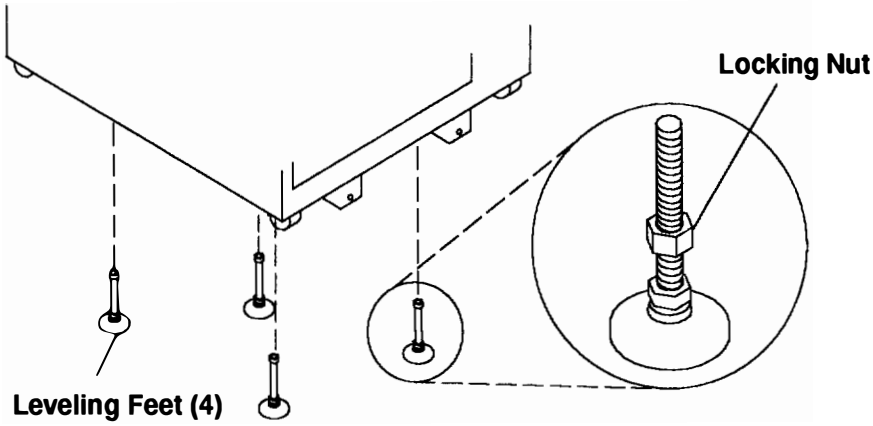
Notes:

If you are attaching the rack to a concrete floor or a raised floor, refer to Step 5 in Chapter 7.

3. ILock each caster wheel by tightening the thumbscrew on the caster.

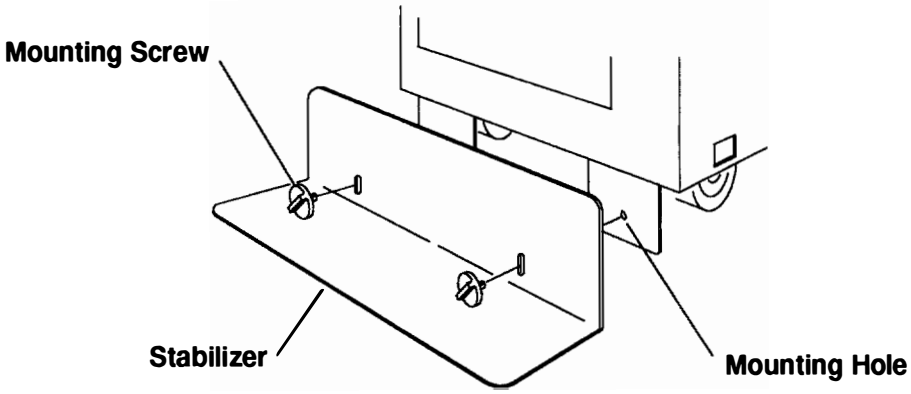


4. Adjust the leveling feet by doing the following:
   a. Loosen the locking nut by turning the locking nut counter-clockwise (away from the bottom of the rack).
   b. Adjust the height of the leveling feet by rotating the leveling feet either upward or downward according to the level of the surface on which the rack is placed. Repeat this for the remaining leveling feet as needed.
   c. When the rack is level, tighten the locking nuts on all of the leveling feet.

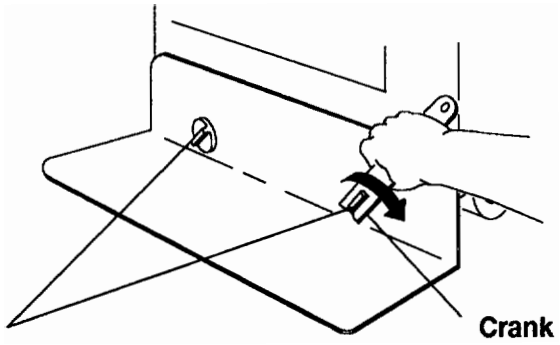


Note: If you are installing a front electrical mounting plate, refer to Step 5 .3 in Chapter 7.

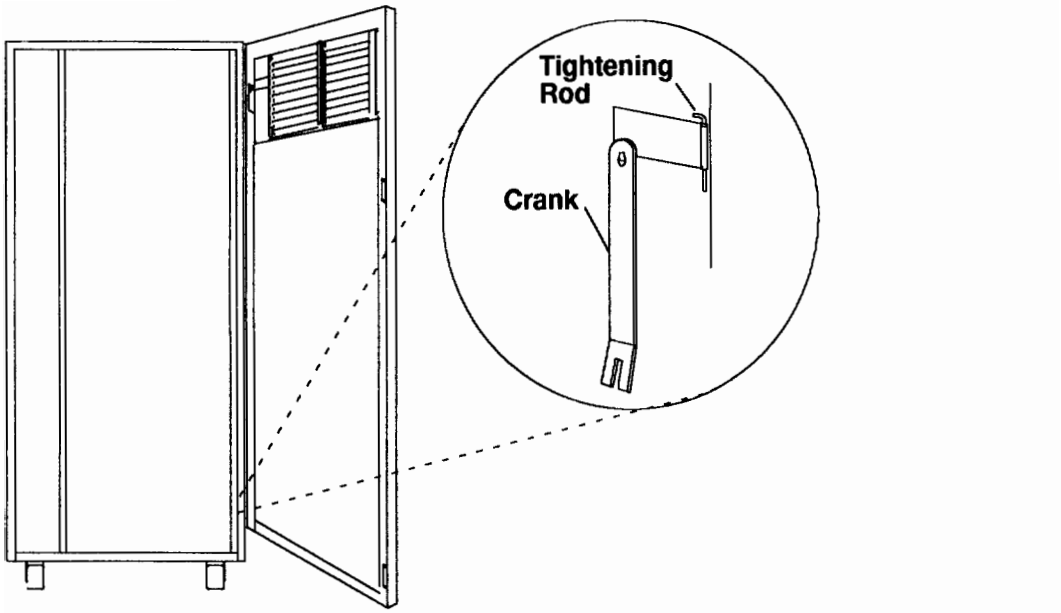
5. Align the slots in the stabilizer with the mounting holes in the bottom front of the rack.
6. Ensure that the base of the stabilizer rests firmly on the floor.
7. Install the two mounting screws and hand tighten.



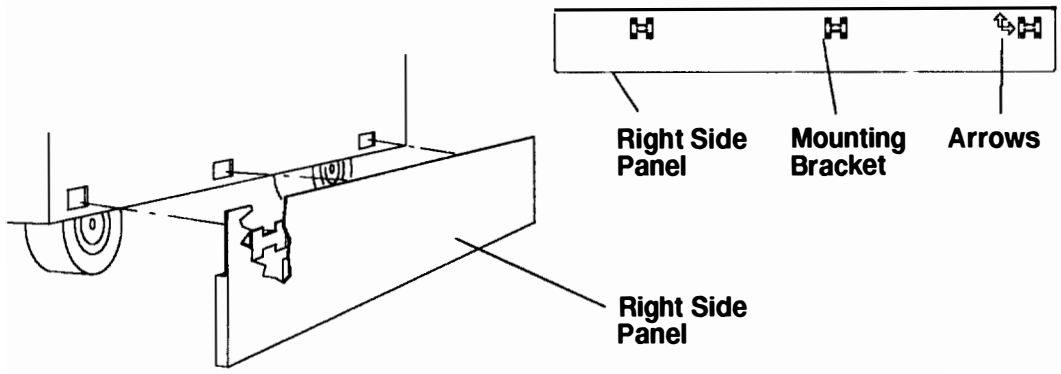
8. Use the crank supplied with the system unit to alternately tighten the mounting screws until they are firmly seated.



9. Hang the crank and tightening rod on the bracket near the bottom of the right wall inside the back of the rack.



10. Install the side panels so that the arrows inside the panels point forward and to the top.



11. If head protectors are installed, remove them from all diskette drives.

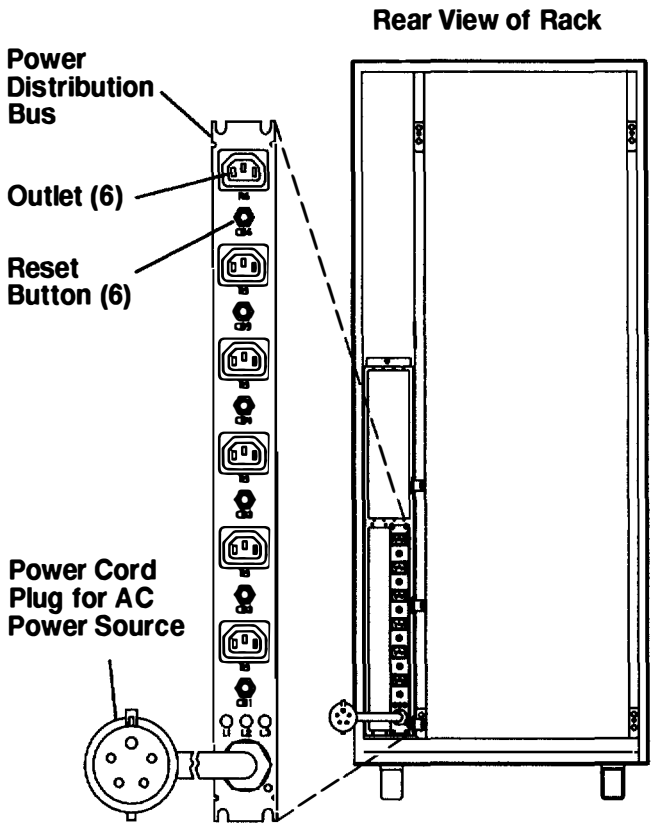
Notes:

If a power distribution bus (PDB) is installed in the rack, perform Step 6., and then continue to "Step 8 Set Up Each Device Being Attached" on page 6-12.

If a battery backup unit is installed in the rack perform Step 7.; otherwise, go to "Step 8. Set Up Each Device Being Attached" on page 6-12.

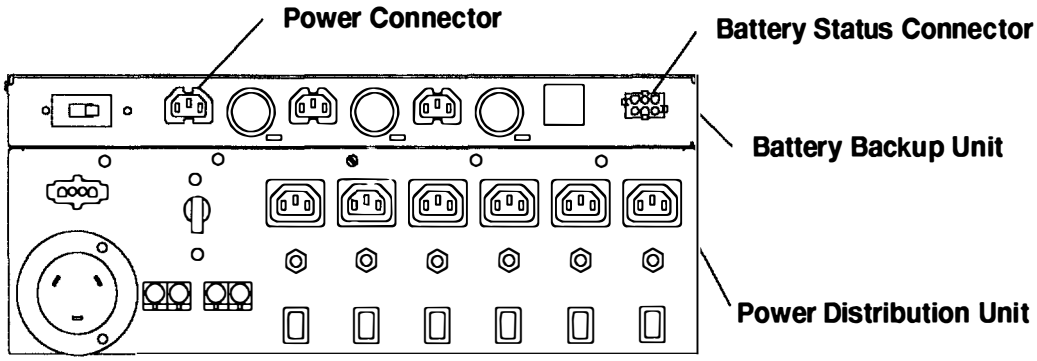
Step 6. Setting Up the Power Distribution Bus

1. Plug the drawer power cords into the PDB.
2. Plug the PDB power cord into the customer's electrical outlet or power cord.



Step 7. Setting Up the Battery Backup Unit

1. Unplug the battery status cable and all drawer power cables from the battery backup unit (BBU).



2. Grasp the sides of the BBU front cover, and then pull the cover away from the unit.
3. Remove the retaining screws from the front of the BBU.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

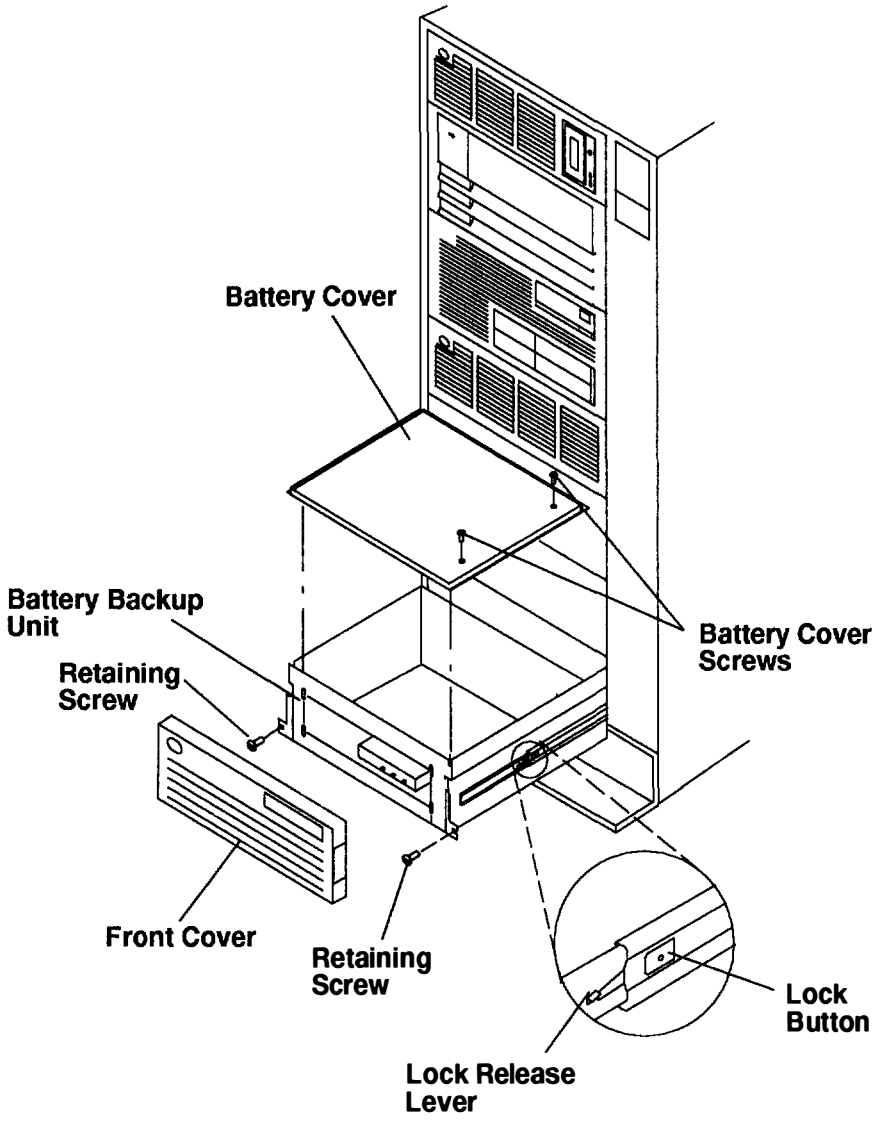
CAUTION:
When the drawer is extended, its weight can turn over a rack that is not steady. Before you pull the drawer out of the rack, ensure that a rack stabilizer is attached to the bottom front of the rack.

Do not pull out more than one drawer at a time. The rack can turn over if you pull out more than one drawer at a time.

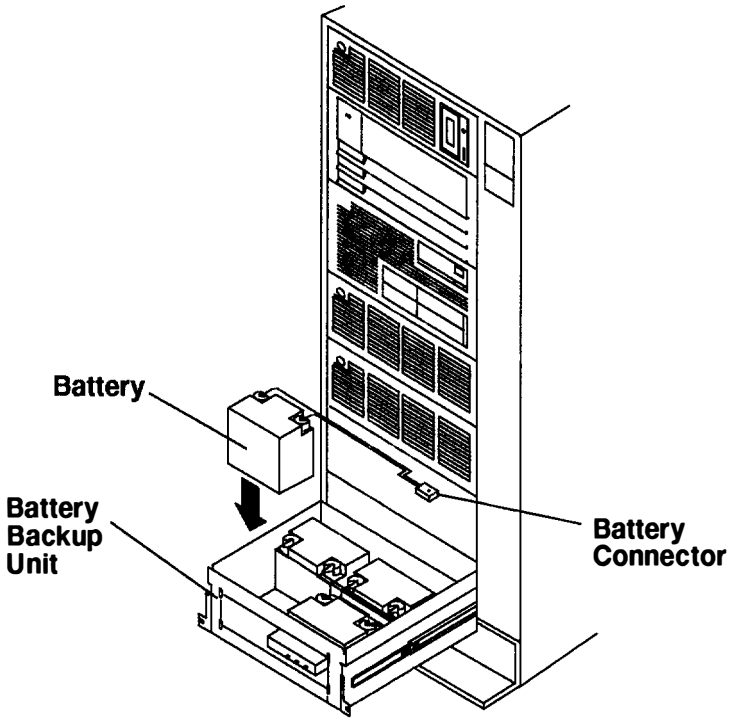
4. Pull the BBU out of the system unit until the lock buttons on the rails lock.

Note: The rack must be either secured to the floor or the stabilizer must be firmly attached to the bottom-front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the rack is not secured to the floor or the stabilizer is not attached to the rack.

5. Remove the two battery cover screws, and then remove the battery cover.



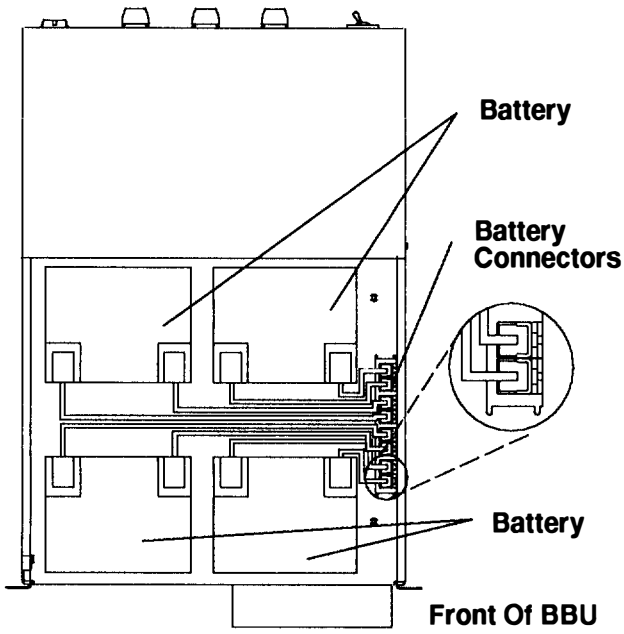
6. Place the four batteries inside the BBU.



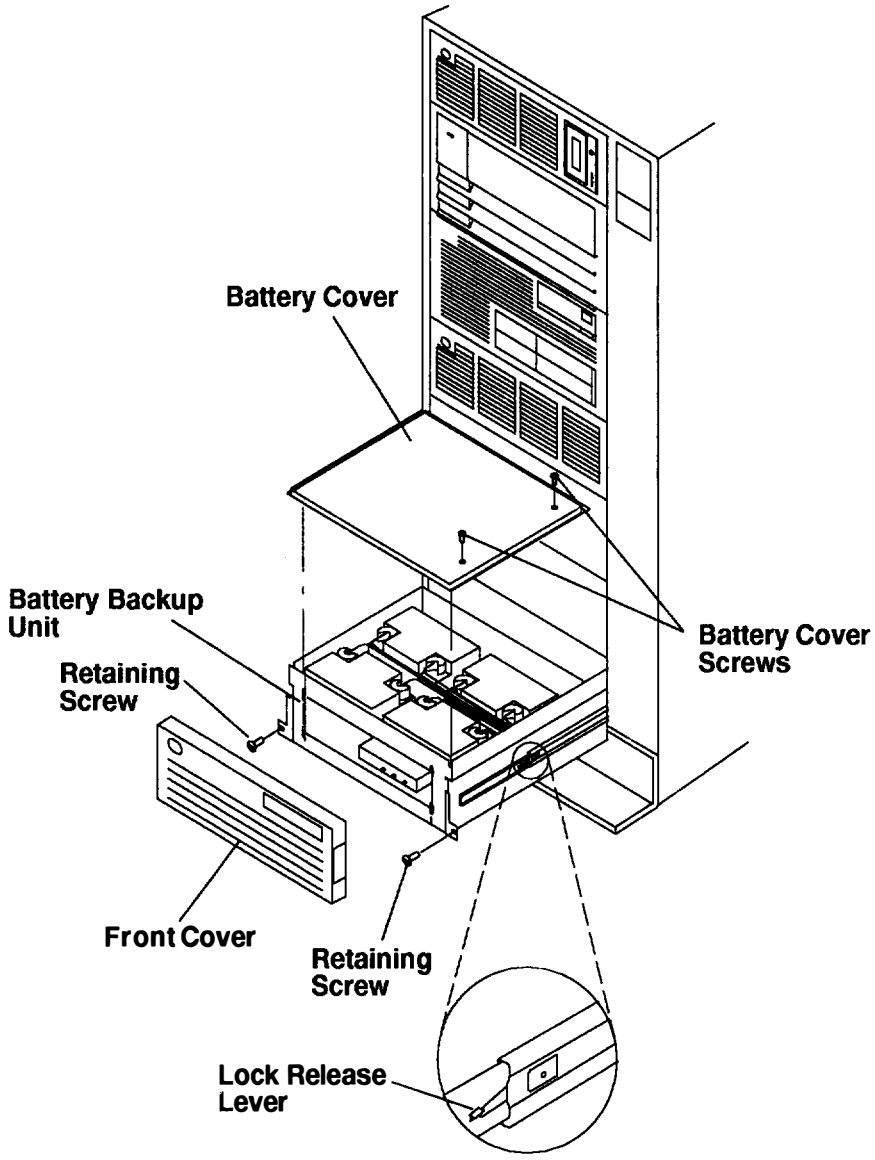
Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
The battery connectors are polarized to prevent improper connection. Do not attempt to reverse the polarity. The connectors on the battery cables must be plugged only into the stationary receptacles provided. Plugging two battery cables together may cause sparking, overheating, or explosion.

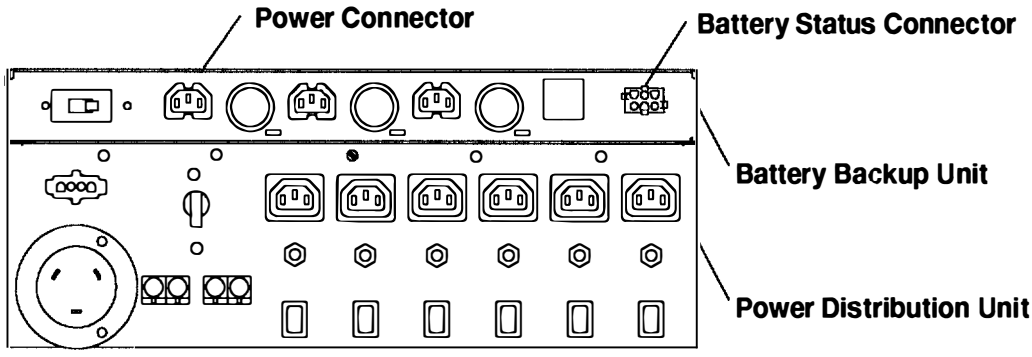
7. Plug each battery cable into a connector on the right side of the BBU.



8. Replace the battery cover.
9. Press the lock release levers on the BBU, and push the BBU into the system unit.
10. Replace the retaining screws, then replace the front cover of the BBU.



11. Plug any cables into the BBU that you unplugged during Step 1.



Step 8. Set Up Each Device Being Attached

Note: During the setup of each device, connect only the device end of the signal cable. *Do not* connect the device signal cables to the system unit now.

__ Do the set up instructions provided in the documentation with each device being attached to this rack; then return to Step 9 for the 7015 Model R30 CPU Enclosure.

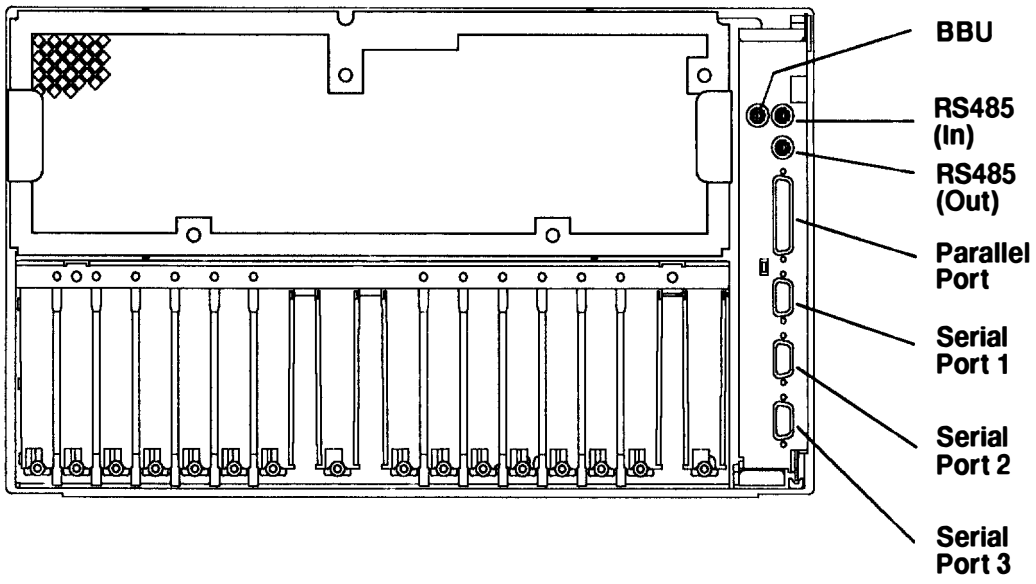
Step 9. Model R30 CPU Enclosure

Step 9.1. Connecting Devices to the System Interface Board Ports

__ Using the customer planning information, the *POWERstation and POWERserver Common Diagnostics Information Manual*, or other information supplied by the customer, connect the cables to the system interface board ports.

__ As needed, use the cable labels included in the ship group to label the cables. For additional information about labeling the cables, refer to the *POWERstation and POWERserver Common Diagnostics Information Manual*.

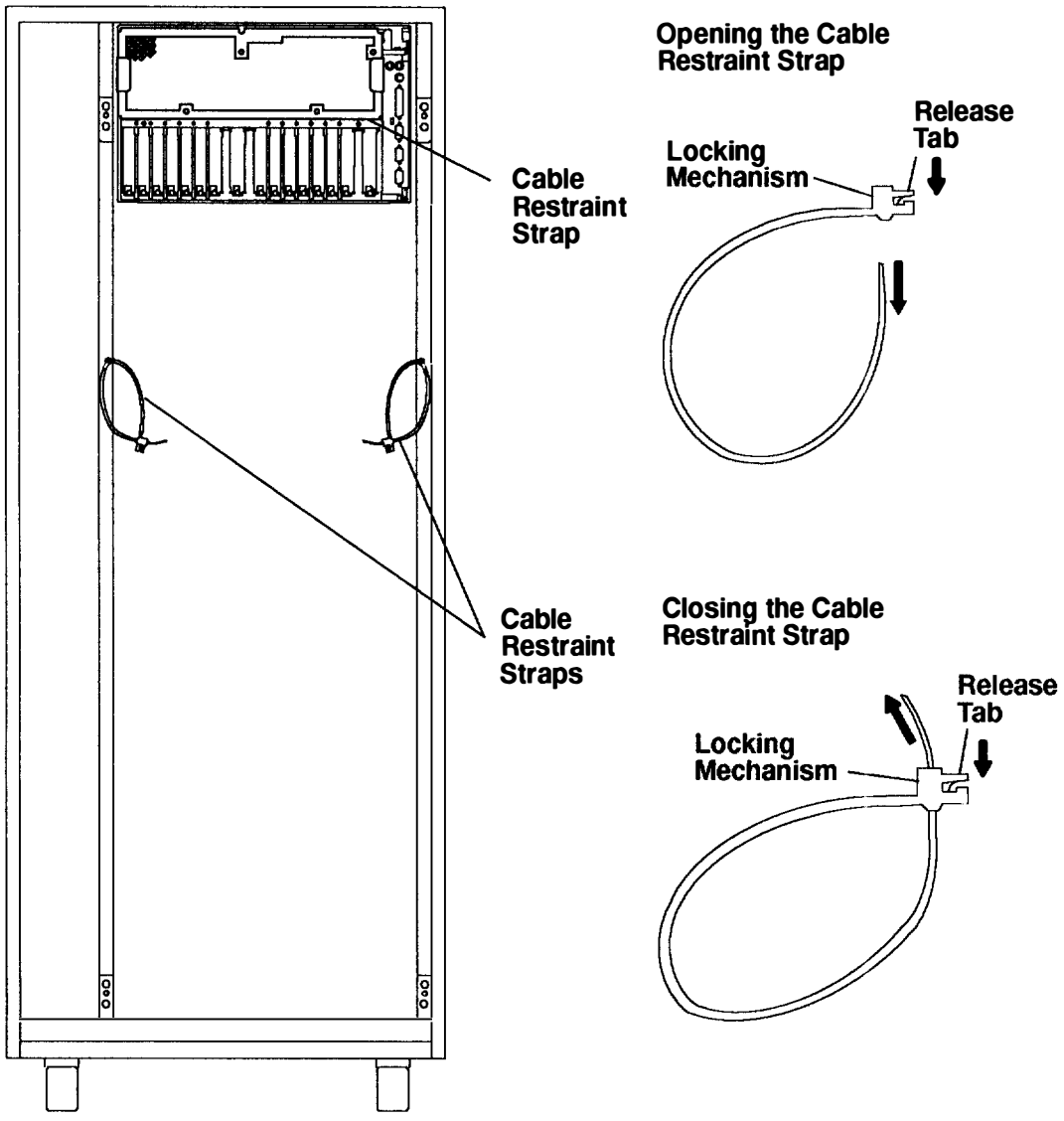
Rear View of CPU Enclosure



Cable restraints are supplied with the rack and can be installed in the rack.

1. Open the cable restraint strap by pressing the release tab and then pulling the end of the cable restraint strap through the locking mechanism.
2. Place the cables within the cable restraint strap.
3. Close the strap by placing the end of the cable restraint strap through the locking mechanism, and then pull the end of the cable restraint strap to tighten the cables against the rack.

Rear View of Rack



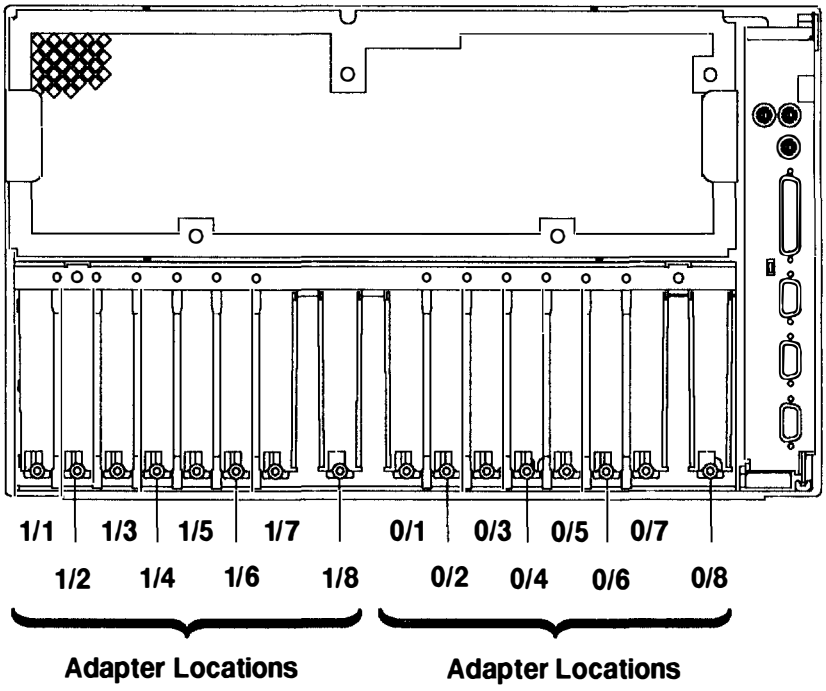
Step 9.2. Connecting Devices to Adapters in the Model R30 CPU Enclosure

__ Using the customer planning information, the *POWERstation and POWERserver Common Diagnostics Information Manual*, or other information supplied by the customer, connect the cables to the adapter or optional adapter connectors at the rear of the CPU enclosure.

Do the following steps to connect devices to adapters or optional adapters in drawers.

1. Open the back cover of the system unit.
2. Look at the adapter slots in the rear of the CPU enclosure and locate all of the adapters or optional adapters that will have cables attached to them.
3. Connect all of the cables to the adapters or optional adapters.

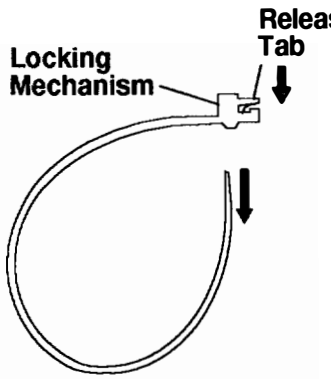
Rear View of CPU Enclosure



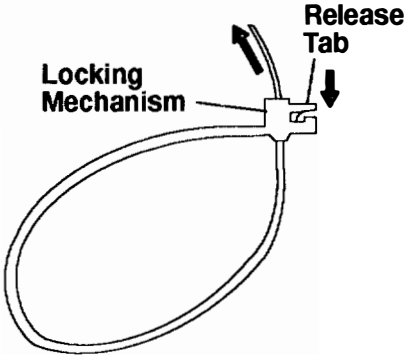
4. Use the cable restraint straps to attach the cables to the rack. To open the cable restraint strap, press the release tab while pulling the end of the cable restraint strap through the locking mechanism.
5. To attach the cables to the rack, do the following:
   a. Open the cable restraint strap.
   b. To attach adapter cables to the rack, gather the cables attached to the adapters, and then place the cable bundle in the cable restraint strap located below the adapters on your left.

      To attach optional adapter cables to the rack, gather the cables attached to the optional adapters, and then place the cable bundle in the cable restraint strap located below the optional adapters on your right.
   c. With the cable restraint strap around the cables, place the end of the cable restraint strap through the locking mechanism, and then pull the end of the cable restraint strap to tighten the cables against the rack.

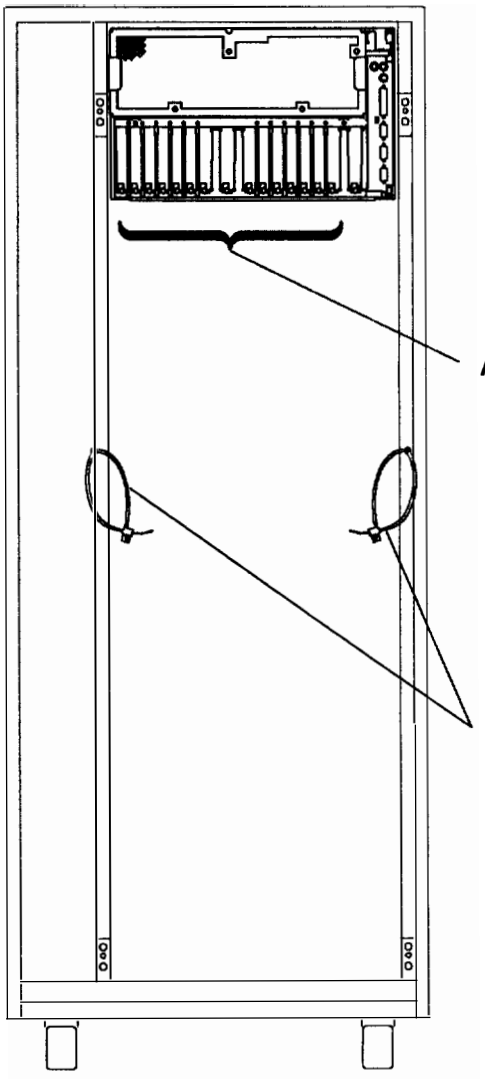
Opening the Cable Restraint Strap



Closing the Cable Restraint Strap

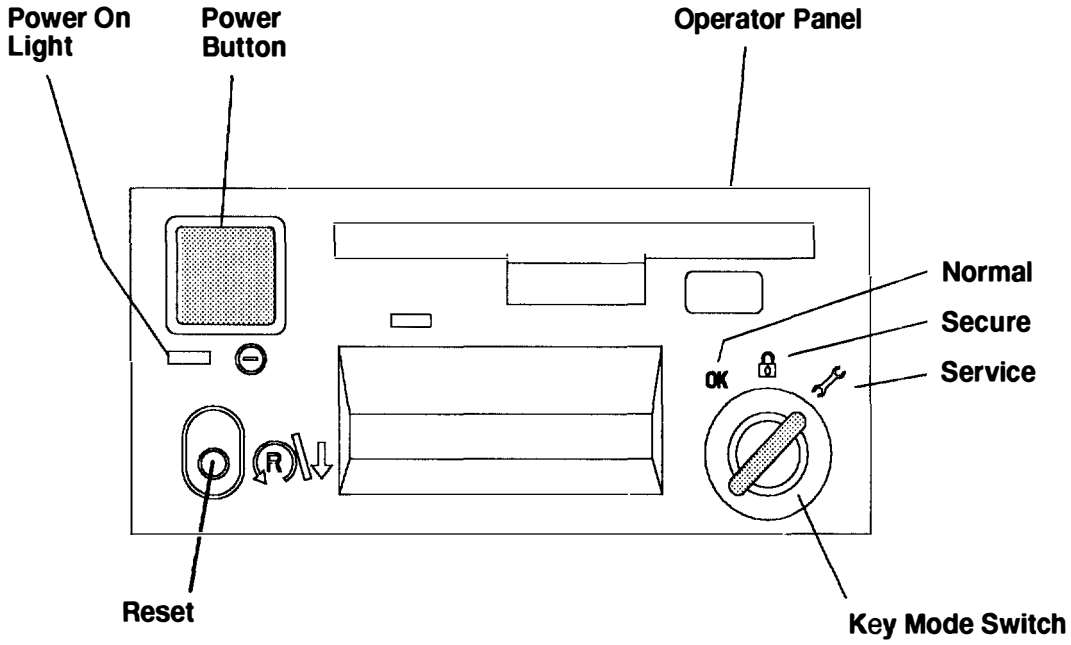


Rear View of Rack



Step 10. Powering On and Checking Out the System with a Power Distribution Unit

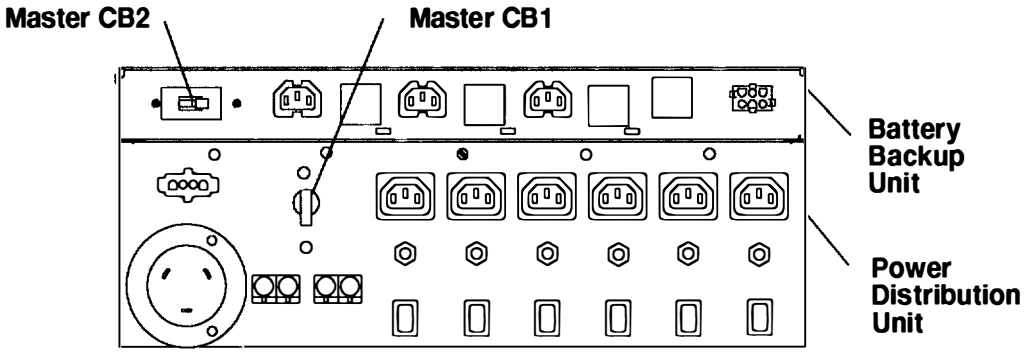
1. If your system is a high availability system, make sure all power control interface (PCI) cables (if installed) are disconnected. High availability systems usually require drawers to remain powered on when the CPU is powered off. If the power control to certain drawers in your system is different from the factory settings, use your planning information and Chapter 1 to understand power control.
2. Set the key mode switch to the Service position.



3. Plug the power cords of the external devices into outlets.
4. Plug the system unit power cord into an outlet.
5. If the battery backup unit is installed, set the Master CB2 circuit breaker to On.

Note: Ensure that the key mode switch is set to the Service position to prevent system unit power from being switched on unexpectedly.

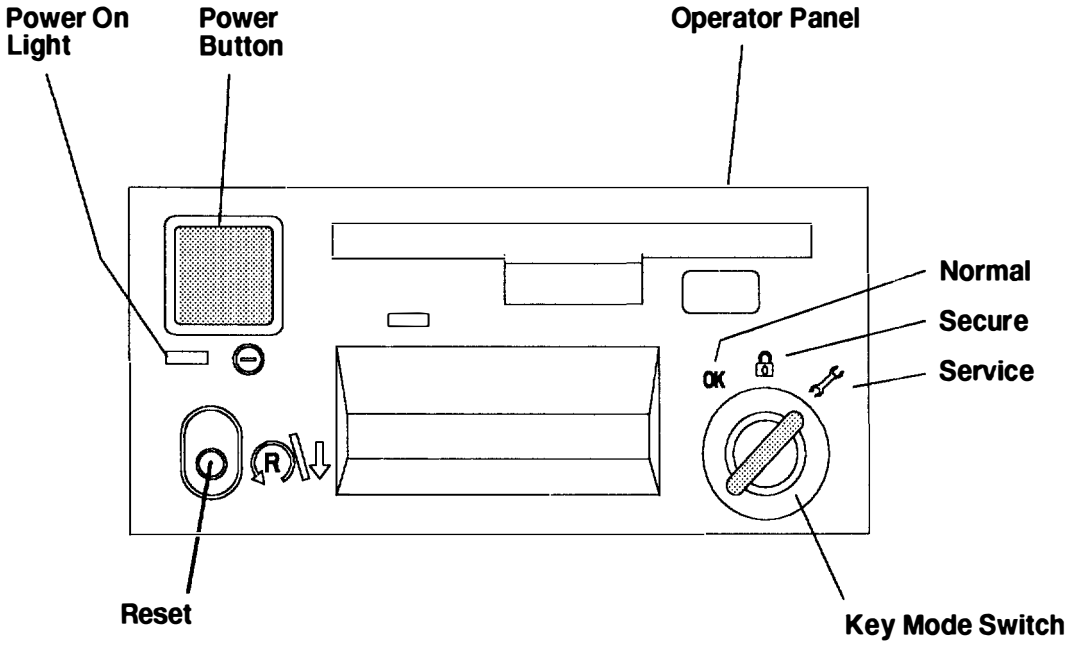
6. Set the Master CB1 circuit breaker to On.



7. Go to Chapter 5 of the *POWERstation and POWERserver Common Diagnostics Information Manual* and follow the instructions in the "Installation Checkout" procedure.

Step 11. Powering On and Checking Out the System with a Power Distribution Bus

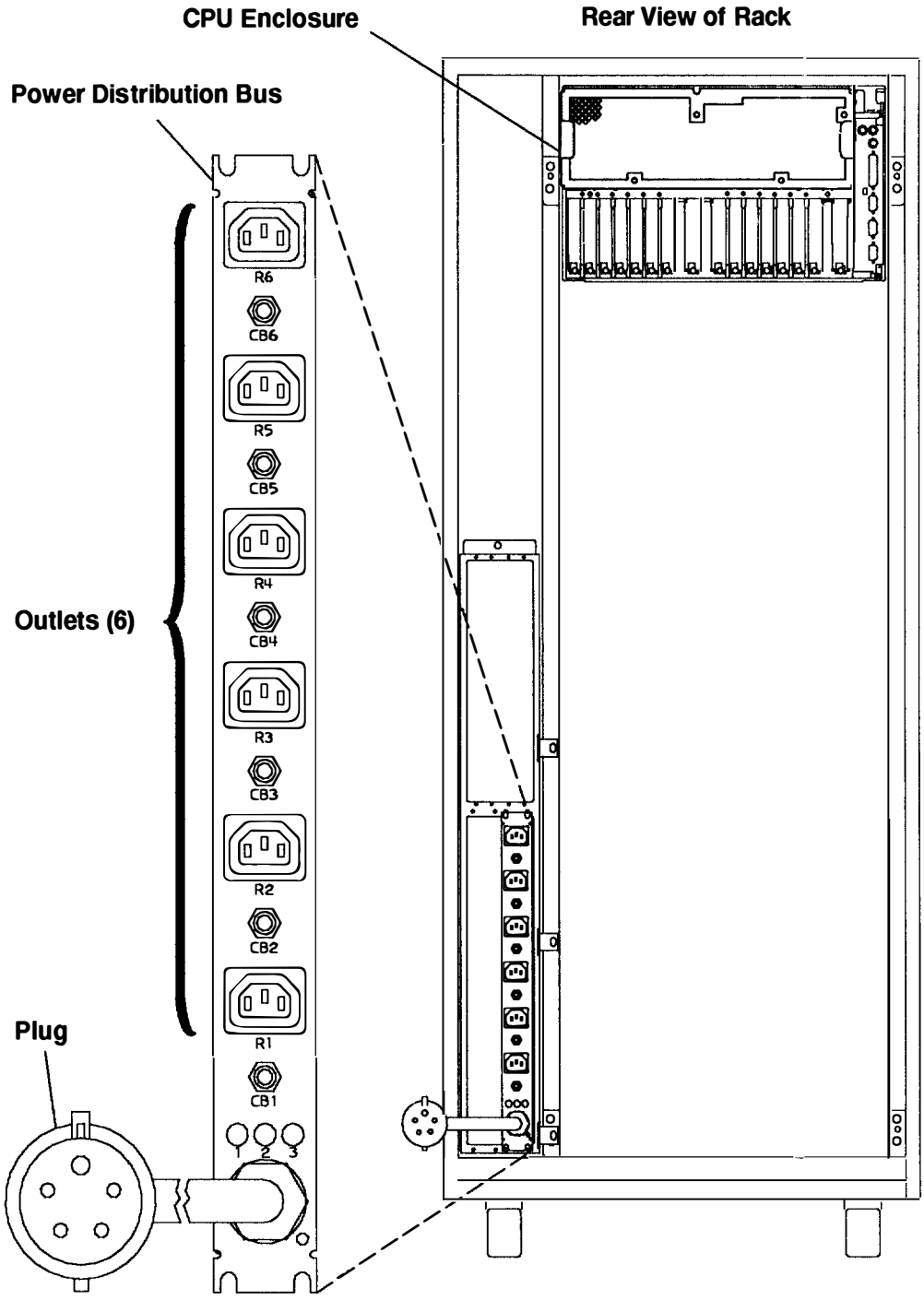
1. High availability systems usually require drawers to remain powered on when the CPU is powered off. If the power control to certain drawers in your system is different from the factory settings, use your planning information and Chapter 1 to understand power control.
2. Set the key mode switch to the Service position.



3. Plug the power cords of the external devices into outlets.
4. Plug the system unit power cord into an outlet.

Note: Ensure that the key mode switch is set to the Service position to prevent system unit power from being switched on unexpectedly.

5. Go to Chapter 5 of the *POWERstation and POWERserver Common Diagnostics Information Manual* and follow the instructions in the "Installation Checkout" procedure.



Chapter 7. System Installation (-48 V dc Rack)

This chapter contains information about system installation for a 7015 -48 V dc rack. For information about system installation for an AC 7015 rack, refer to Chapter 6.

Step 1. Inventory

For a list of documentation and supplies, refer to Step 1., Inventory, in "System Installation" on page 6-1.

Step 2. Arranging the Books

For information about arranging the books, refer to Step 2., Arranging the Books, in "System Installation" on page 6-1.

Step 3. Observe This Safety Notice during Installation

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Note: An electrical hazard from an external -48 V dc power source exists in this unit. To prevent electrical shock, ensure that power to this unit is off before servicing.

Step 4. National Electric Code Compliance

Note: The 7015 Model R00 rack must be installed only in restricted access areas such as dedicated equipment rooms or equipment closets in accordance with Articles 110–16, 110–17, and 110–18 of the National Electrical Code, ANSI/NFPA No. 70.

Step 5 . Setting Up the System Unit (-48 V dc Rack)

Notes:

1. If the rack will be mounted on a concrete floor perform Step 4.1 on this page.

   If the rack will be mounted to a concrete floor beneath a raised floor, perform Step 5 .2 on page 7-5.

   If the rack will not be mounted to any concrete floor, perform Step 5, substep 1 through substep 11, on pages 6-4 through 6-6.

2. The customer is responsible for attaching the rack mounting plates to the concrete floor.

Step 5 .1. Attaching the Rack to a Concrete Floor

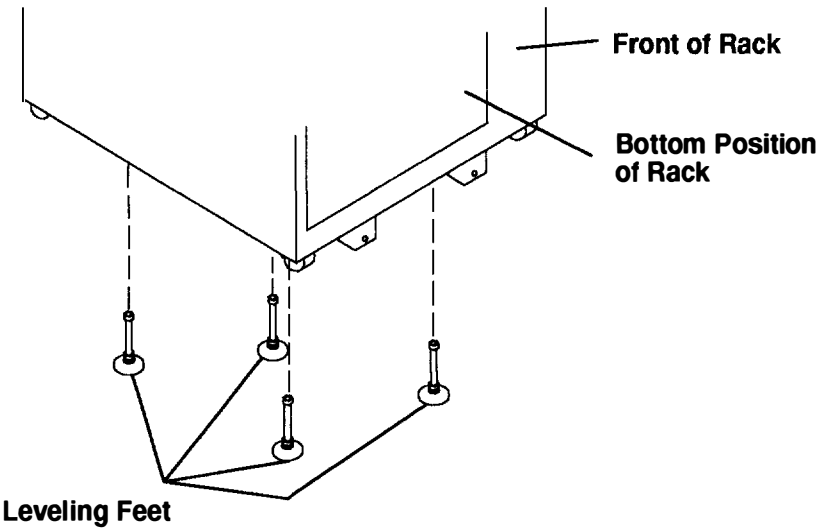
It is the customer's responsibility to unpack the system unit and place it where it is to be installed. If this has not been done, consult the customer and the marketing representative as necessary.

Note: Because of the long length of the four rack-mounting bolts, the drawer located in the bottom position of the rack must be removed to install the four rack-mounting bolts to the floor.

1. If the customer has not unpacked the system unit, removed all packing and tape from the rack.
2. Position the rack according to the customer floor plan.

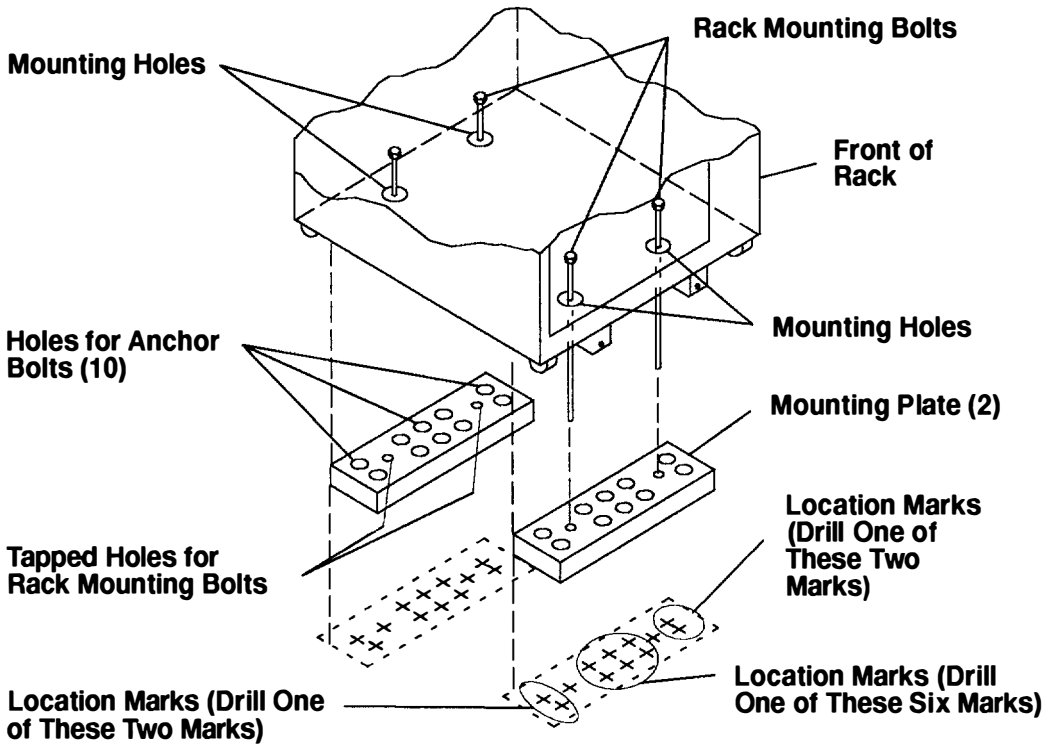
Note: If the power distribution unit or the battery backup unit are installed in the bottom position of the rack, remove them. Refer to Chapter 4 for information about removing the power distribution unit or the battery backup unit.

3. Remove the drawer in the bottom position in the rack. For information about removing the disk drive drawer from the rack, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*. If a PDU or BBU is installed in the bottom position, refer to Chapter 4 for information about removing the PDU or BBU.
4. Level the rack using the four adjustable leveling feet.



5. Mark the floor around the edge of each leveling foot.
6. Place the two mounting plates in the approximate mounting locations under the rack.
7. To align the rack over the mounting plates, do the following:
   a. Place the four rack-mounting bolts through the mounting holes at the bottom of the rack.
   b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes.
   c. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.
8. Mark the floor around the edge of both mounting plates.
9. Remove the mounting bolts from the threaded holes.
10. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.
11. Mark the floor at the center of each hole in the mounting plate (including the tapped holes).
12. Remove the two mounting plates from the marked locations.
13. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the ends of the rack-mounting bolts may protrude past the thickness of the mounting plate).

Note: A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.



14. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.

15. Using at least three anchor bolts for each mounting plate, mount the two mounting plates to the concrete floor.

16. Using the location marks for the leveling feet as a guide, reposition the rack over the mounting plates.

17. Place the four rack-mounting bolts through the four metal washers, and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.

18. To further align the rack over the mounting plates do the following:

    a. Place the four rack-mounting bolts (with the four plastic isolator washers) through the mounting holes in the bottom of the rack.

    b. Align the four mounting bolts to the location of the four tapped holes in the two mounting plates.

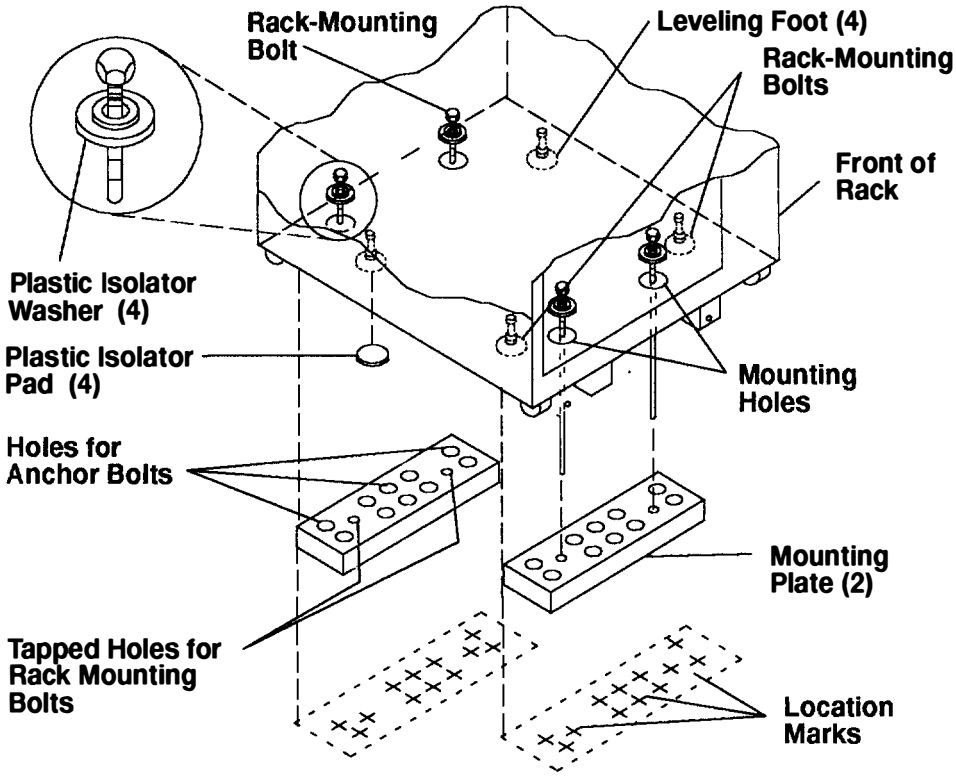
    c. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.

Notes: The bottom of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled.

If you are installing an AC rack, do not use the four plastic isolator pads.

19. Place the four plastic isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.

20. Tighten the locking nuts on the leveling feet.



21. Tighten the four rack-mounting bolts into the two mounting plates.

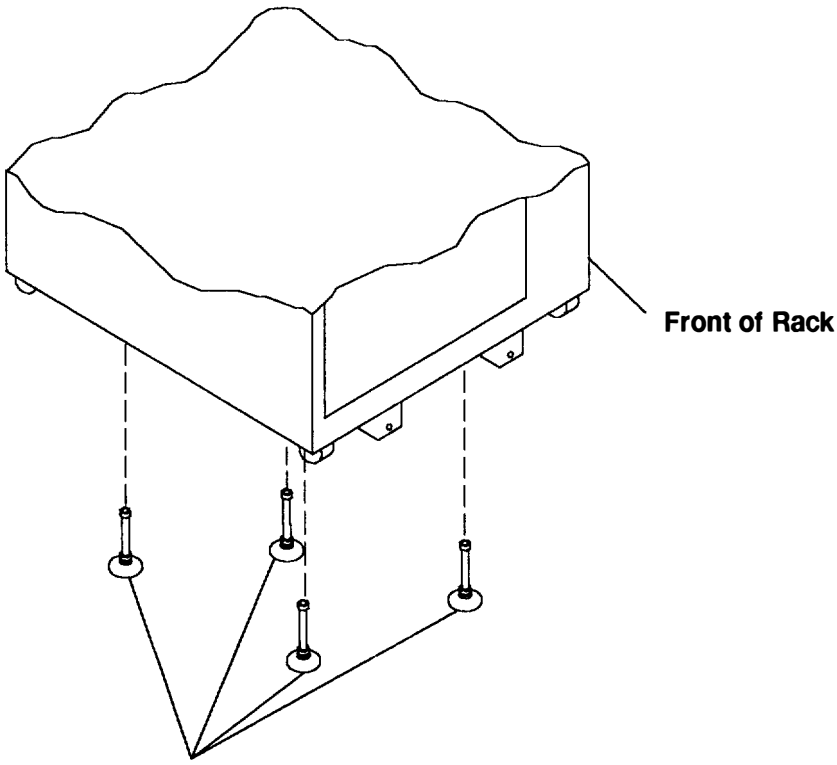
22. If this step completes the rack installation, reinstall the drawer located in the bottom position of the rack. For information about installing the disk drive drawer from the rack, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*. If a PDU or BBU was installed in the bottom position, refer to Chapter 4 for information about installing the PDU or BBU.

    If this step does not complete the rack installation, continue to Step 5 .3 on page 7-9.

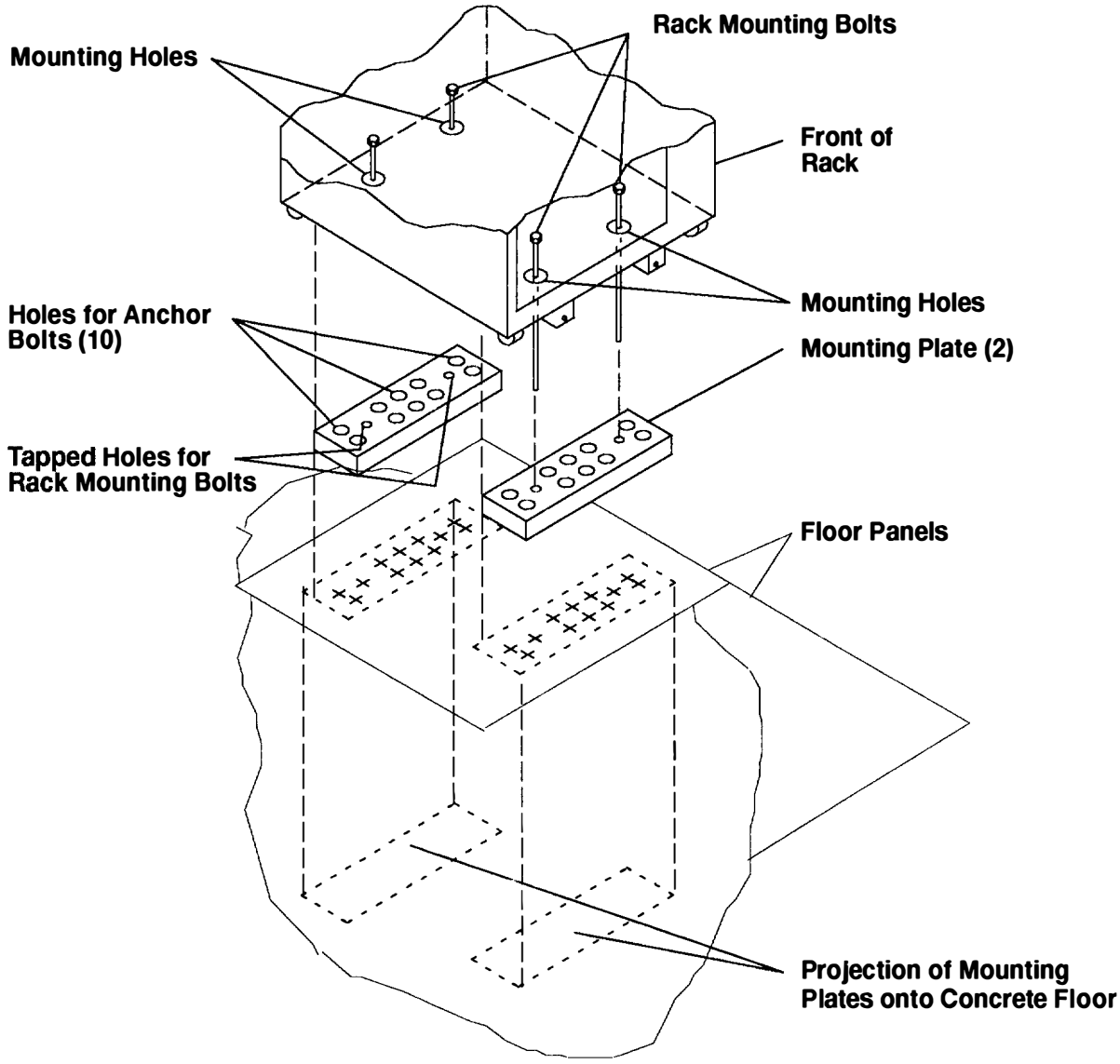
Step 5 .2. Attaching the Rack to a Concrete Floor Beneath a Raised Floor

Note: Because of the long length of the four rack-mounting bolts, the drawer located in the bottom position of the rack must be removed to install the four rack-mounting bolts to the raised floor.

1. If the customer has not unpacked the system unit, removed all packing and tape from the rack.
2. Position the rack according to the customer floor plan.
3. Remove the drawer located in the bottom position of the rack. For information about removing the disk drive drawer from the rack, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*. If a PDU or BBU is installed in the bottom position, refer to Chapter 4 for information about removing the PDU or BBU.
4. Level the rack using the four adjustable leveling feet.
5. Mark the floor locations around the edge of each leveling foot.
6. Place the two mounting plates in the approximate mounting locations under the rack.



7. To align the rack over the mounting plates, do the following:
   a. Place the four rack-mounting bolts in the mounting positions at the bottom of the rack.
   b. Align the tapped holes of the mounting plates with the location of the four rack–mounting bolts.
   c. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.
8. Mark the raised-floor panel around the edge of both mounting plates.
9. Remove the mounting bolts from the threaded holes.
10. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.
11. Mark the raised-floor panel at the center of each hole in the mounting plates (including the tapped holes).
12. Remove the two mounting plates from the marked locations.



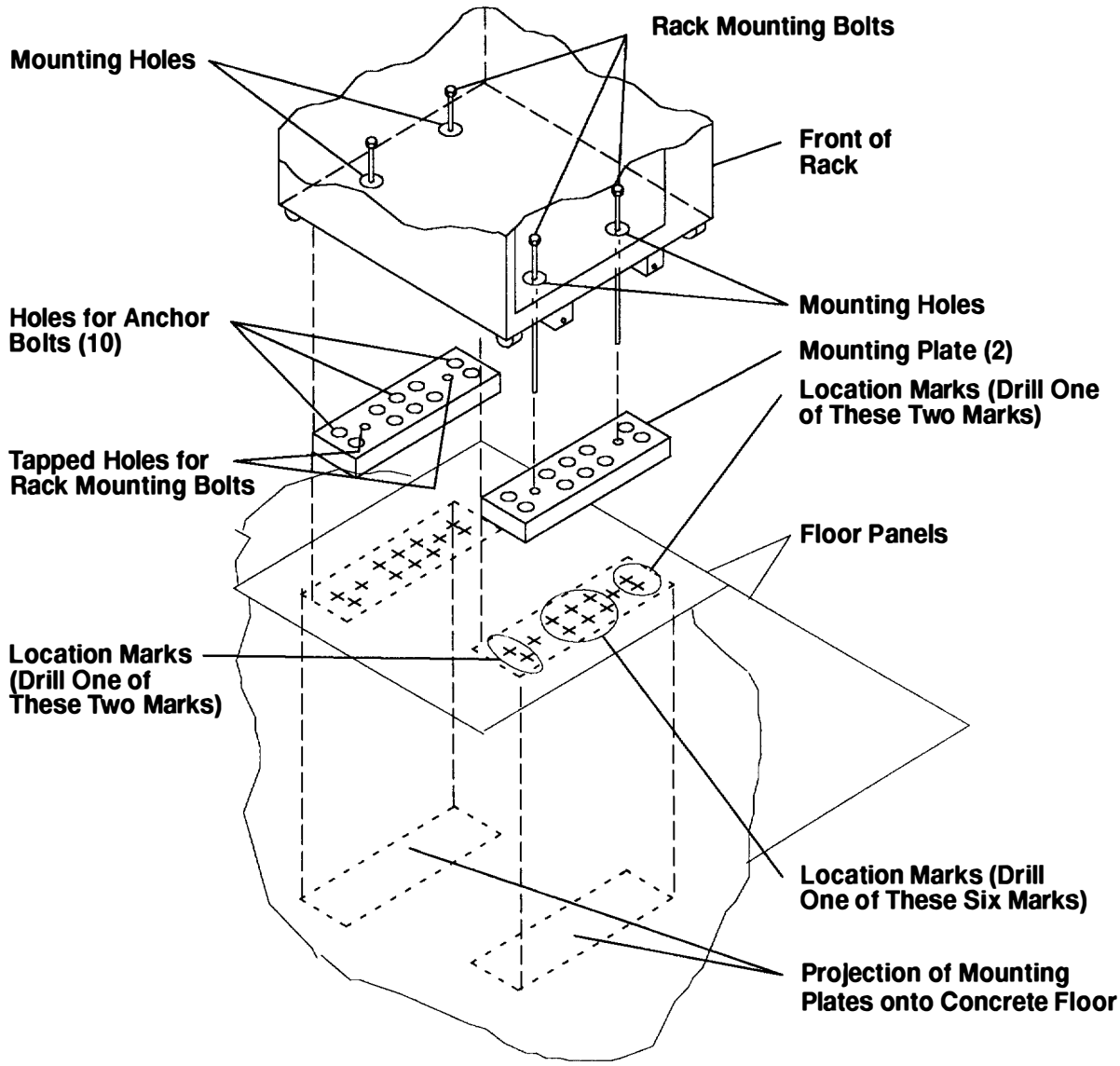
13. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the ends of the rack-mounting bolts may protrude past the thickness of the mounting plate).

Note: A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the raised floor panel. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other and one at the center.

14. Drill one hole in each group of anchor bolt location marks as indicated on the marked raised floor panel.

15. Ensure that the marks for the holes for the anchor bolts in the concrete floor align with the holes in the raised floor panel.

16. Drill the holes in the concrete floor for the anchor bolts.



17. Place the two mounting plates on the locations indicated on the marked raised-floor panel.

18. Using at least three anchor bolts for each mounting plate, mount the two mounting plates through the raised-floor panel to the concrete floor.

19. Using the location marks for the leveling feet as a guide, reposition the rack over the mounting plates.

20. Place the four rack-mounting bolts through the four metal washers and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.

21. To align the rack over the mounting plates, do the following:

    a. Place the four rack-mounting bolts in the mounting positions at the bottom of the rack.

    b. Align the tapped holes of the mounting plates with the location of the four rack–mounting bolts.

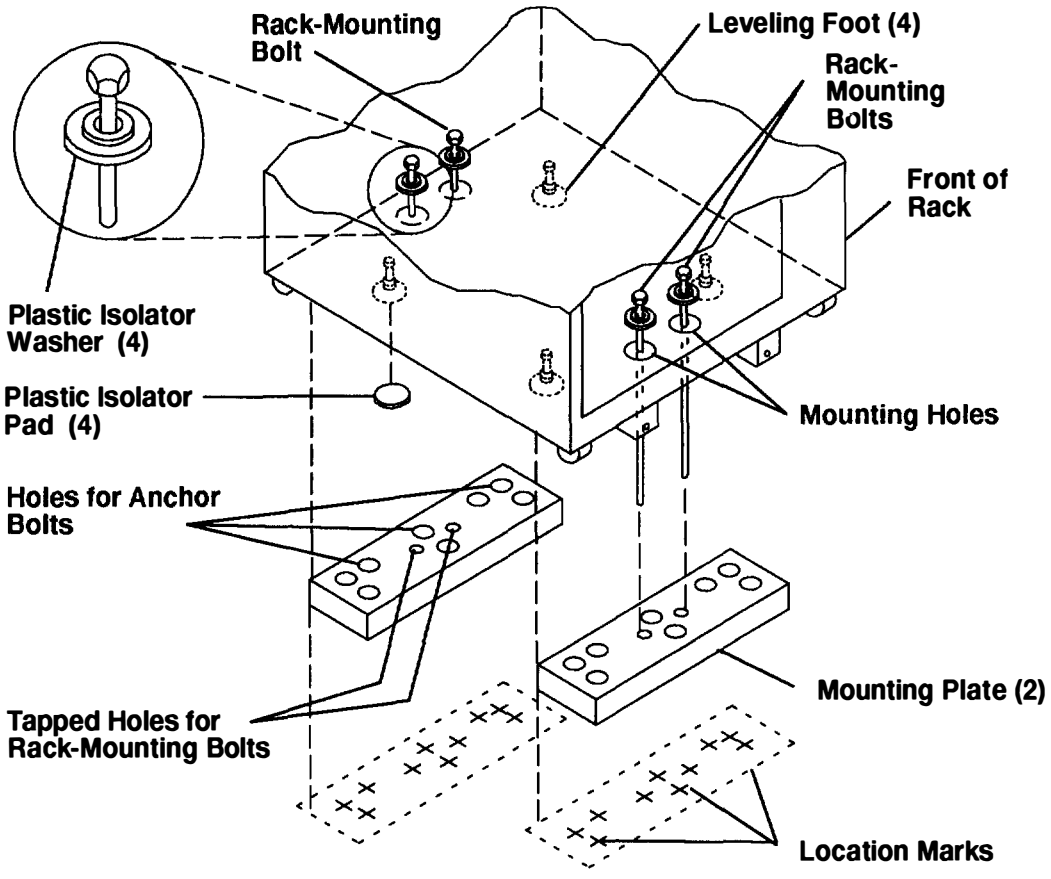
    c. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.

Note: The bottom of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled.

If you are installing an AC rack, do not use the four plastic isolator pads.

22. Place the four isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.

23. Tighten the four rack-mounting bolts into the two mounting plates.



24. Tighten the locking nuts on the leveling feet.

25. If this step completes the rack installation, reinstall the drawer located in the bottom position of the rack. For information about installing the disk drive drawer from the rack, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*. If a PDU or BBU was installed in the bottom position, refer to Chapter 4 for information about installing the PDU or BBU.

    If this step does not complete the rack installation, continue to the next step.

Notes:

1. If the rack is on a raised floor without being attached to the concrete floor below the raised floor, a stabilizer must be installed instead of the front–electrical–outlet mounting plate. The front-electrical-outlet mounting plate cannot be installed on the rack when a stabilizer is installed.
2. If the customer does not want to connect an electrical outlet to the front mounting plate, install the mounting plate without the electrical outlet.

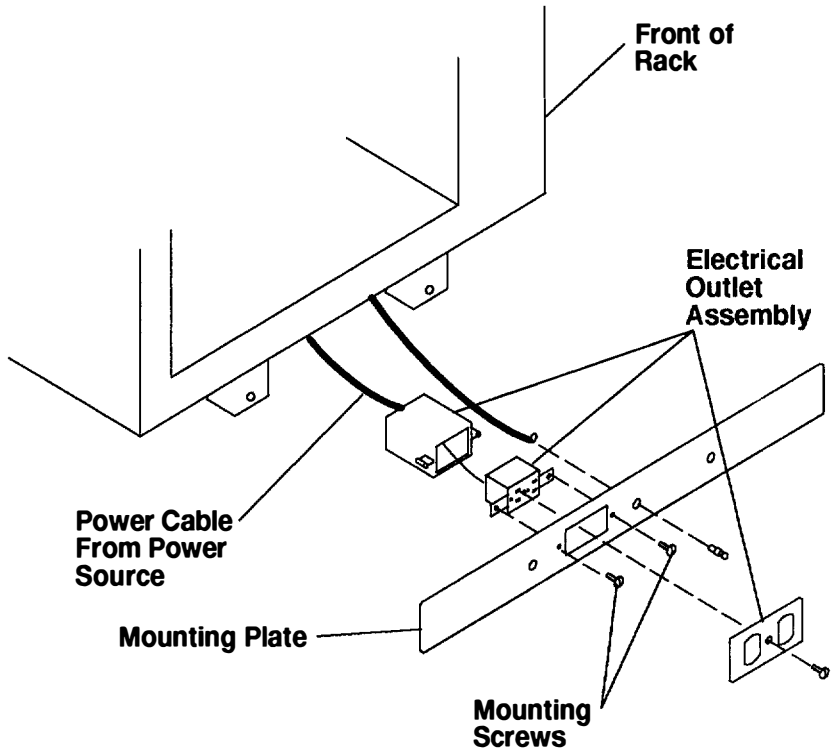
Step 5 .3. Front Electrical Outlet Mounting Plate and Ground Cable

The system may be connected to a -48 V dc power source that is isolated from the AC power source. In addition, the -48 V dc return is connected to ground.

Note: The customer is responsible for providing and connecting the electrical outlet assembly.

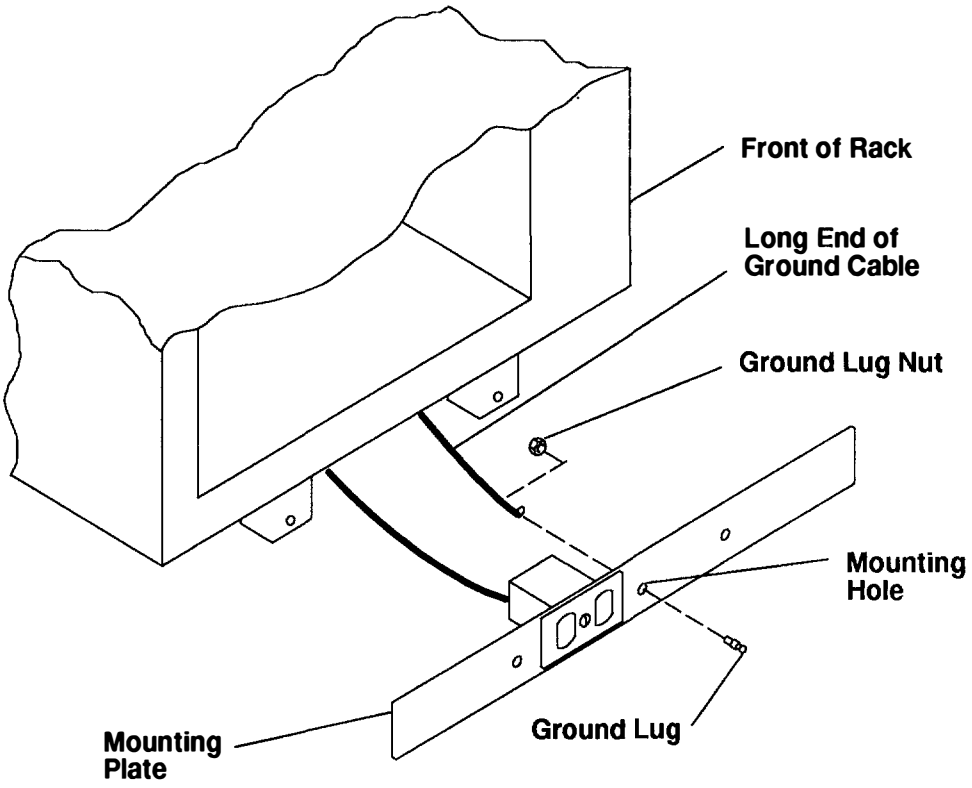
The customer is also responsible for providing and connecting the power cable from the customer power source to the front electrical outlet.

1. After the customer has connected the power cable from the customer power source to the electrical outlet assembly, mount the electrical outlet assembly to the mounting plate using the two mounting screws (provided by the customer).

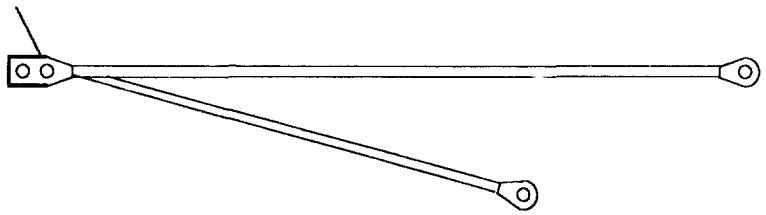


2. Place the ground cable lug through the mounting hole of the mounting plate.
3. Connect the long end of the ground cable to the threaded side of the ground cable lug (inside mounting plate), and then install and tighten the ground lug nut.

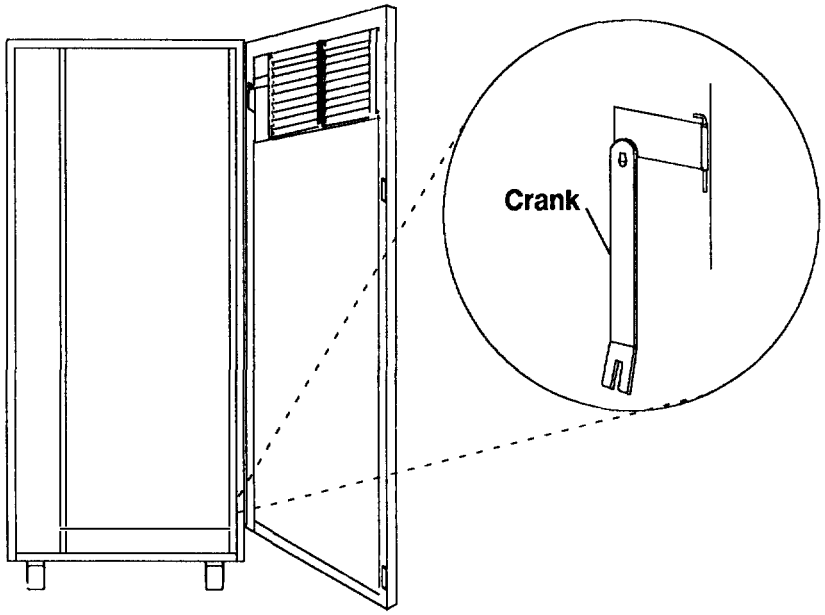
Note: The two remaining connections of the ground cable are done in Step 5 .4 on page 7-12.



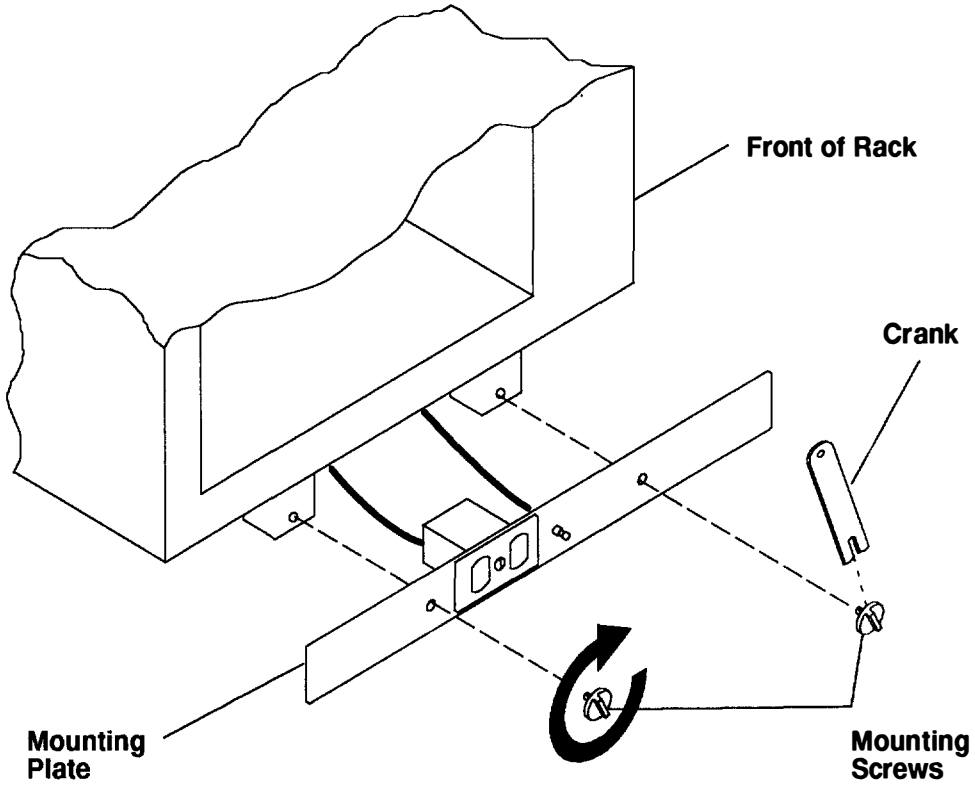
Ground Cable



4. Find the crank (for installing the mounting screws) located inside the rear of the rack near the bottom of the right wall.



5. Align the holes of the mounting plate with the holes on the rack, and then install the two mounting screws.
6. Using the crank, tighten the two mounting screws.



7. Store the crank inside the rear of the rack near the bottom of the right wall.

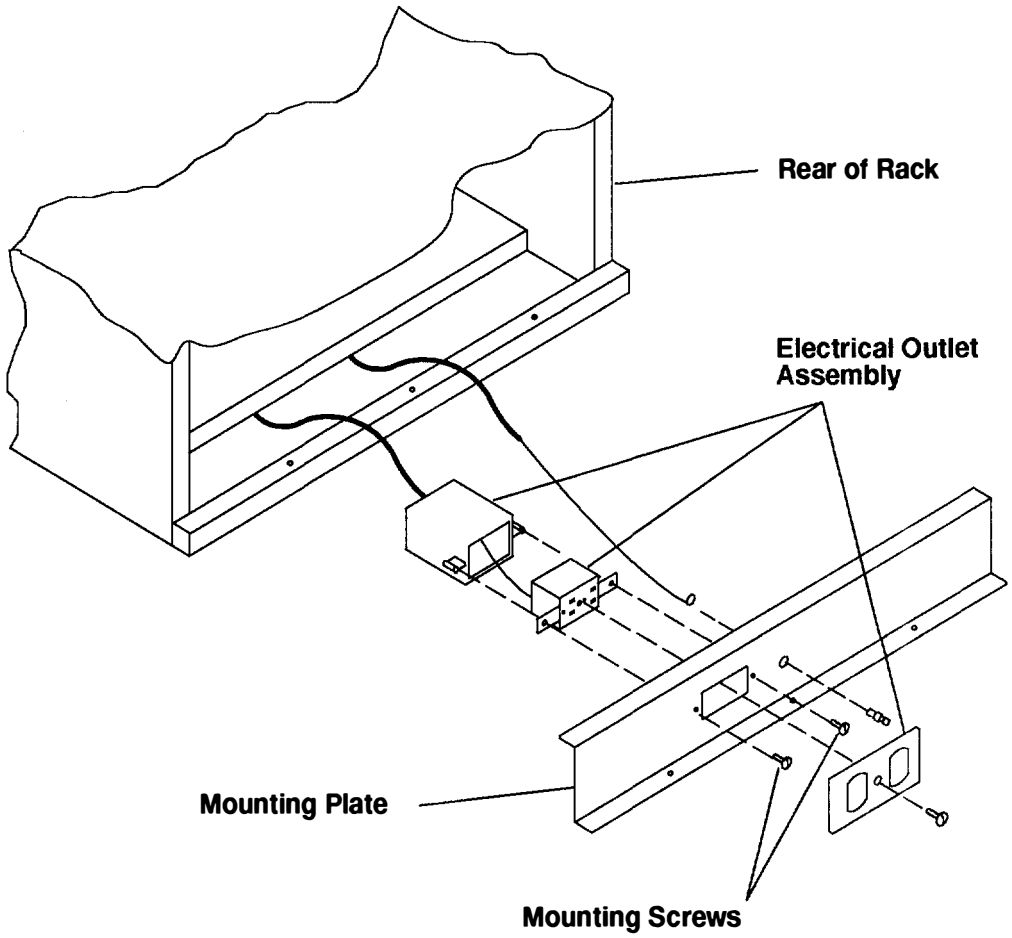
Note: If the customer does not want to connect an electrical outlet to the mounting plate for the rear electrical outlet, install the mounting plate without the electrical outlet.

Step 5 .4. Rear Electrical Outlet Mounting Plate and Ground Cable

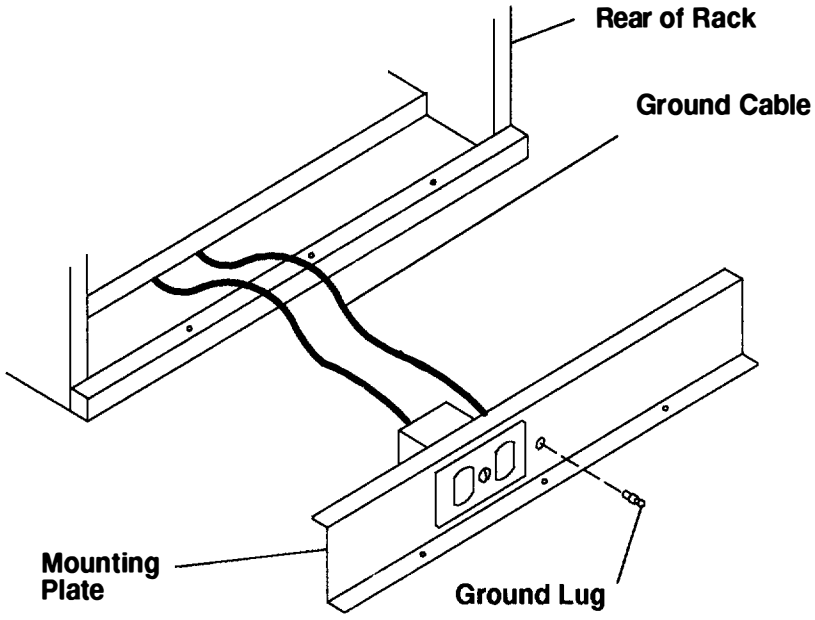
Note: The customer is responsible for providing and connecting the electrical outlet assembly.

The customer is also responsible for providing and connecting the power cable from the customer power source to the rear electrical outlet.

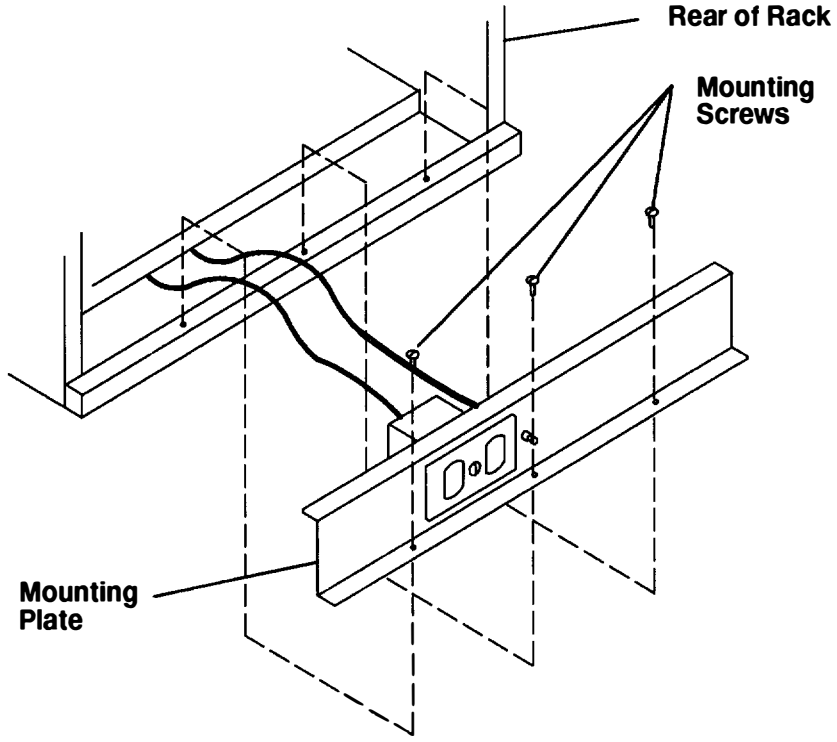
1. Open the rear door of the rack.
2. After the customer has connected the power cable from the customer power source to the electrical outlet assembly, mount the electrical outlet assembly to the mounting plate using the two mounting screws (provided by the customer).



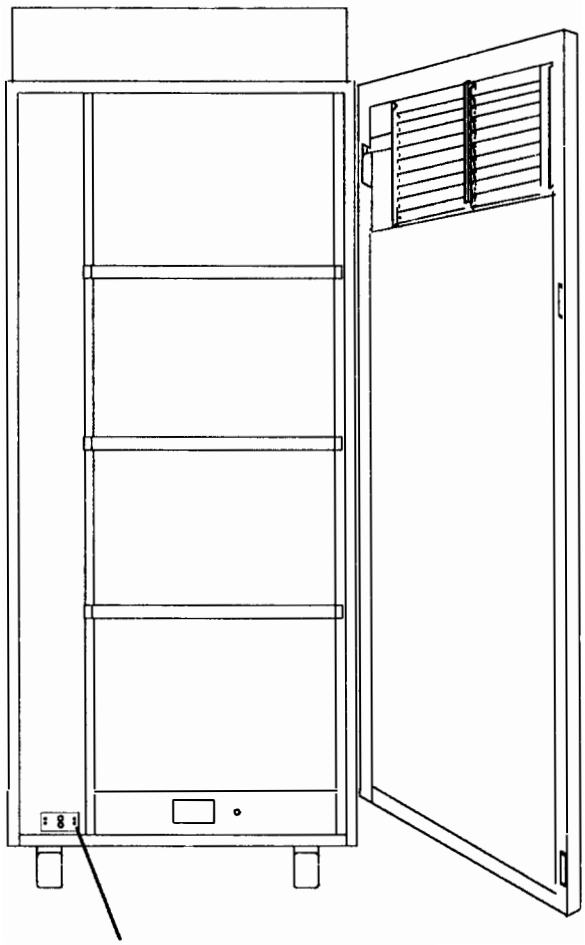
3. Place the ground cable lug through the mounting hole of the mounting plate.
4. Connect the short ground cable to the threaded side of the ground cable lug, and then install and tighten the ground lug nut.



5. Attach the mounting plate to the rack by installing and tightening the three mounting screws.



6. Connect the ground connector of the ground cable to the ground bus bar.
7. If this step completes the rack installation, reinstall the drawer located in the bottom position of the rack. For information about installing the disk drive drawer from the rack, refer to the *9333 Model 010 and 011 High-Performance Disk-Drive Subsystem Installation and Service Guide*. If a PDU or BBU was installed in the bottom position, refer to Chapter 4 for information about installing the PDU or BBU.
8. Close the rear door of the rack.



Ground Bus Bar

Step 6 . Checking Customer Outlets

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
Do not touch the receptacle or the receptacle faceplate with anything other than your test probes before you have met the requirement in Step 8.

1. __ Have the customer locate and turn off the branch circuit CB (Circuit Breaker) or fuse. (Attach tag S229-0237, which reads "Do Not Operate.")

Note: All measurements are made with the receptacle faceplate in the normal installed position.

2. __ Some receptacles are enclosed in metal housings. On receptacles of this type, perform the following steps:

   a. 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. 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. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.

3. __ If any of the three checks made in substep 2 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.

Note: Do not use the digital multimeter to measure grounding resistance.

4. __ 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. __ Check for infinite resistance between the phase pins. This is a check for a wiring short.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
If the reading is other than infinity, do not proceed! Have the customer make necessary wiring corrections before continuing. Do not turn on the branch circuit CB until all the above steps are satisfactorily completed.

6. __ Have the customer turn on the branch circuit CB. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.
7. __ With an appropriate meter, verify that the voltage at the outlet is correct.

Note: Do not use the 120-volt convenience outlets inside a machine to power the tester.

8. __ Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, C7106, or an appropriately approved ground impedance tester.

Step 7 . Model R30 CPU Enclosure with -48 Volt dc Power Supply

Step 7 .1. Connecting Devices to the System Interface Board Ports

For information about connecting devices to the system interface board ports, refer to Chapter 6 of this publication.

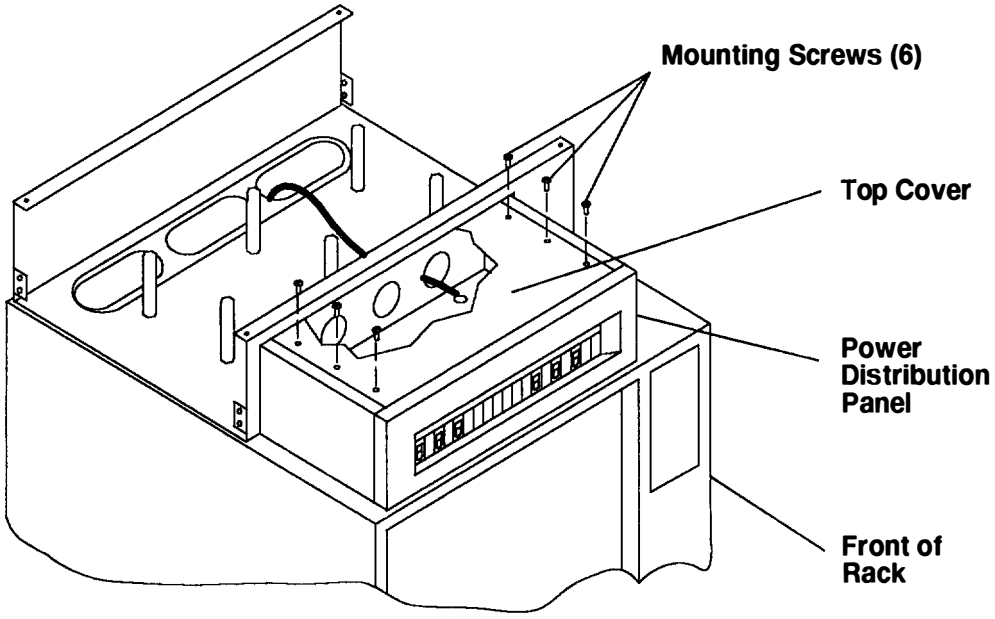
Step 7 .2. Connecting Devices to Adapters in the Model R30 CPU Enclosure

For information about connecting devices to adapters in the CPU enclosure, refer to Chapter 6 of this publication.

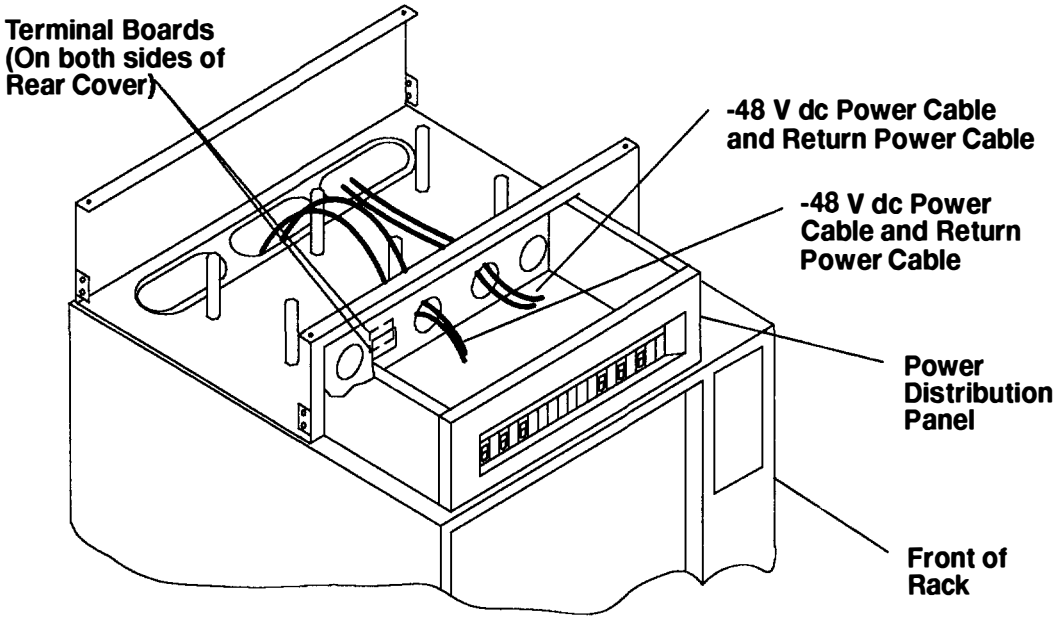
Step 8 . Connecting the Customer's Power Cables

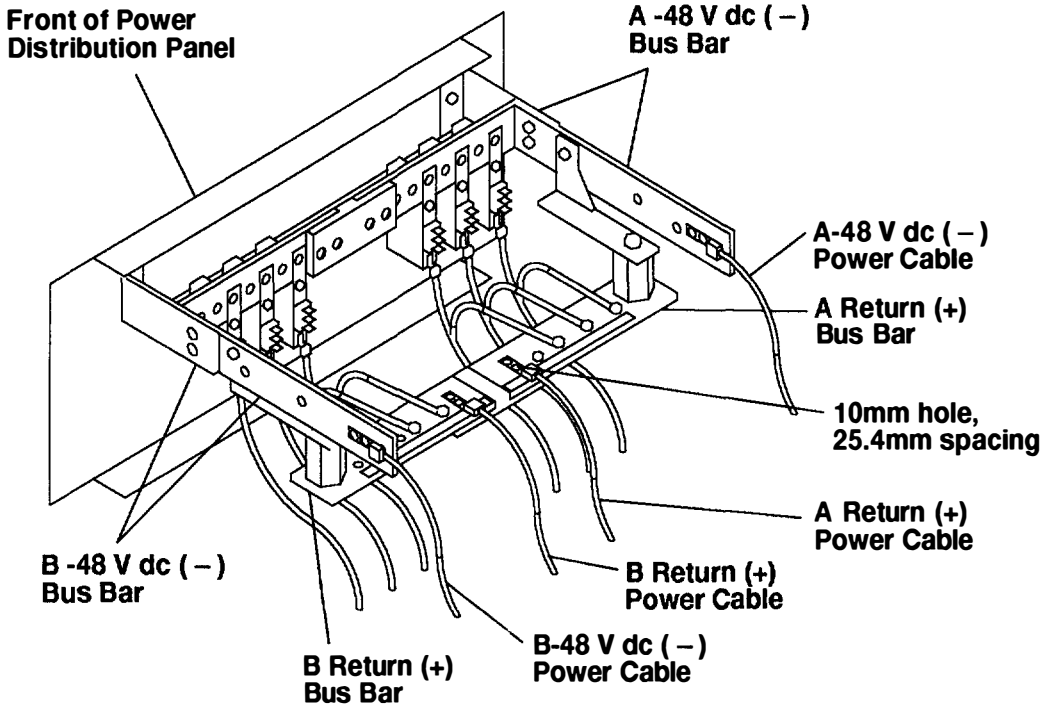
Note: The customer is responsible for providing and connecting the two -48 V dc power cables, and the two return power cables, from the customer's -48 V dc power source to the power distribution panel (PDP) of the -48 V dc 7015 rack. The customer is also responsible for connecting the customer-supplied ground cable to the rack frame.

1. At the customer's -48 V dc power source, switch off all power (from the -48 V dc power sources (A & B) to the power distribution panel (PDP)).
2. After the customer's -48 V dc power source is switched off, place a tag or label over the power source switch (or fuse) to indicate that the power source is intended to be switched off.
3. Remove the six mounting screws from the top cover of the PDP, and then remove the top cover.
4. Remove the insulator from the PDP.
5. Ensure the external –48 V dc power cables have been installed by the customer.

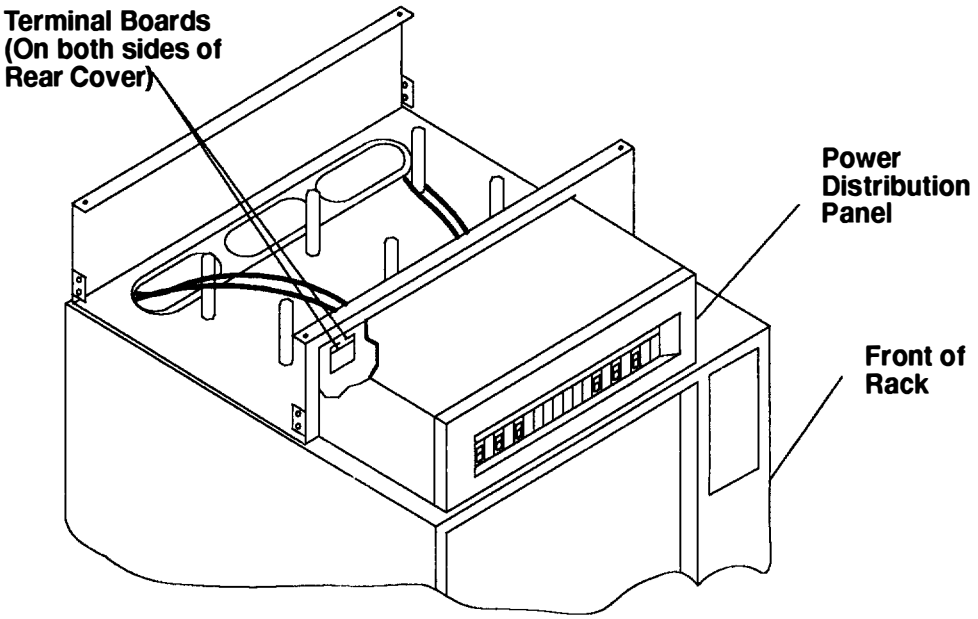


6. Using the power cable connectors provided by the customer, connect the two -48 V dc power cables to the -48 V dc bus bar, and then connect the two return power cables to the return bus bar.





7. Replace the insulation.
8. Replace the top cover of the PDP.
9. If the customer wants to install an alarm (lights or sound), tell the customer to connect the alarm to the terminal board located on the rear cover of the PDP now.

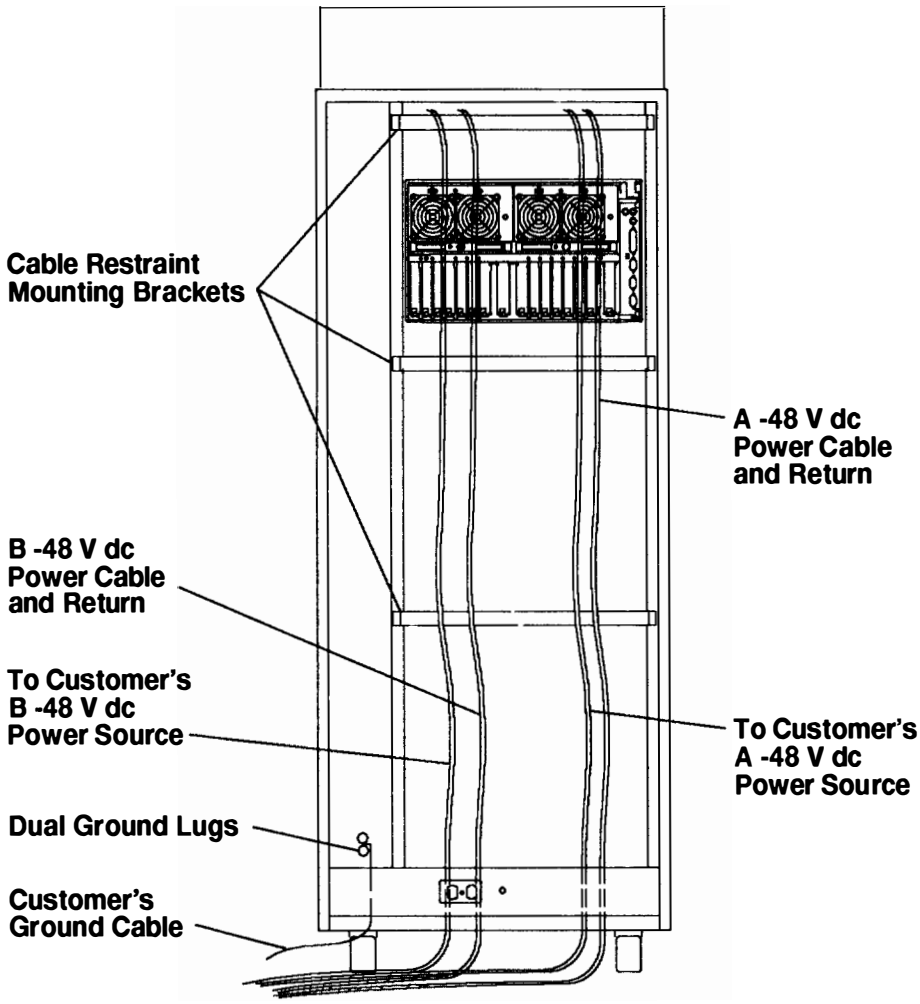


Note: The following illustration shows the power cables going from the top of the rack to the bottom of the rack. The power cables can be sent to and from the PDP from above the rack.

10. Connect the customer's ground cable to the dual ground lugs on the rack.

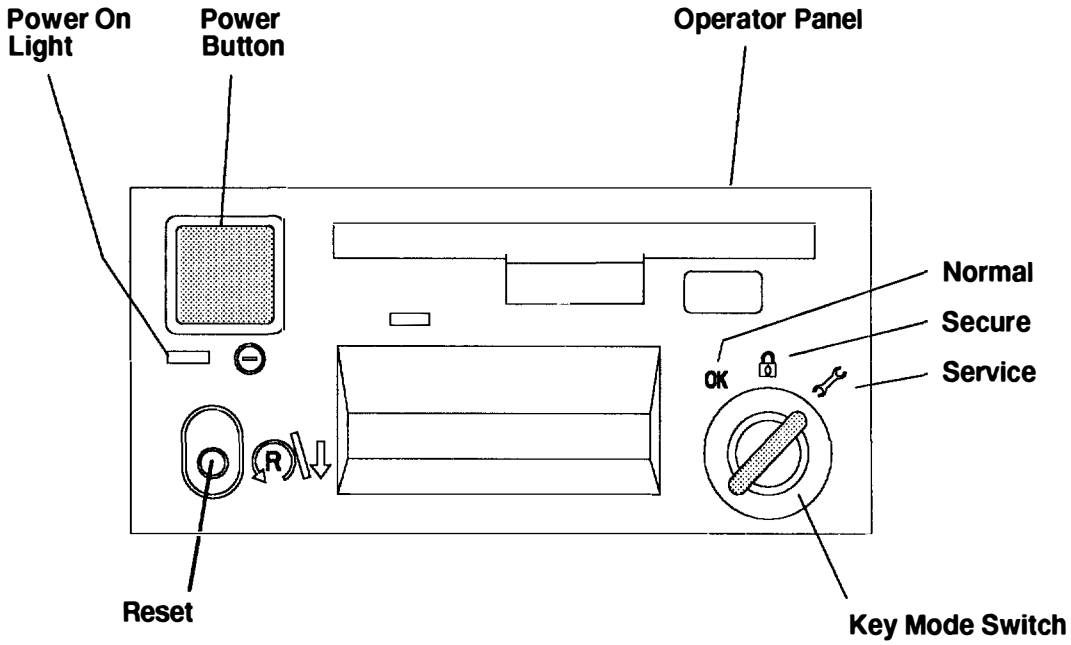
11. Using the cable restraint straps, attach the two -48 V dc power cables and the return power cables to the cable restraint mounting brackets.

Rear View Of Rack



Step 9 . Powering On – Checking Out the System with a PDP

1. If your system is a high availability system, power to all drawers in the rack is distributed by the power distribution panel (PDP). High availability systems usually require drawers to remain powered on when the CPU Enclosure is powered off. Refer to Chapter 2 to understand power control in the -48 V dc rack.
2. Set the key mode switch on the operator panel of the CPU Enclosure (attached rack) to the Service position.

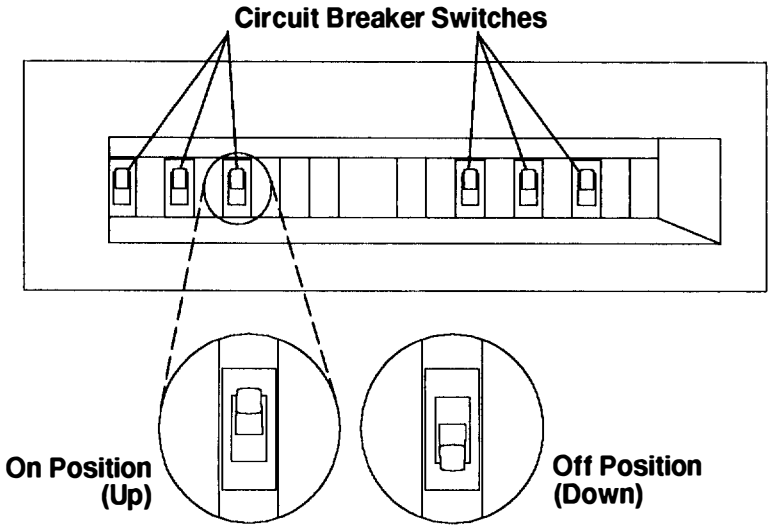


3. Using a multimeter, ensure that the rack is receiving -48 V dc power on both -48 v dc bus bars.

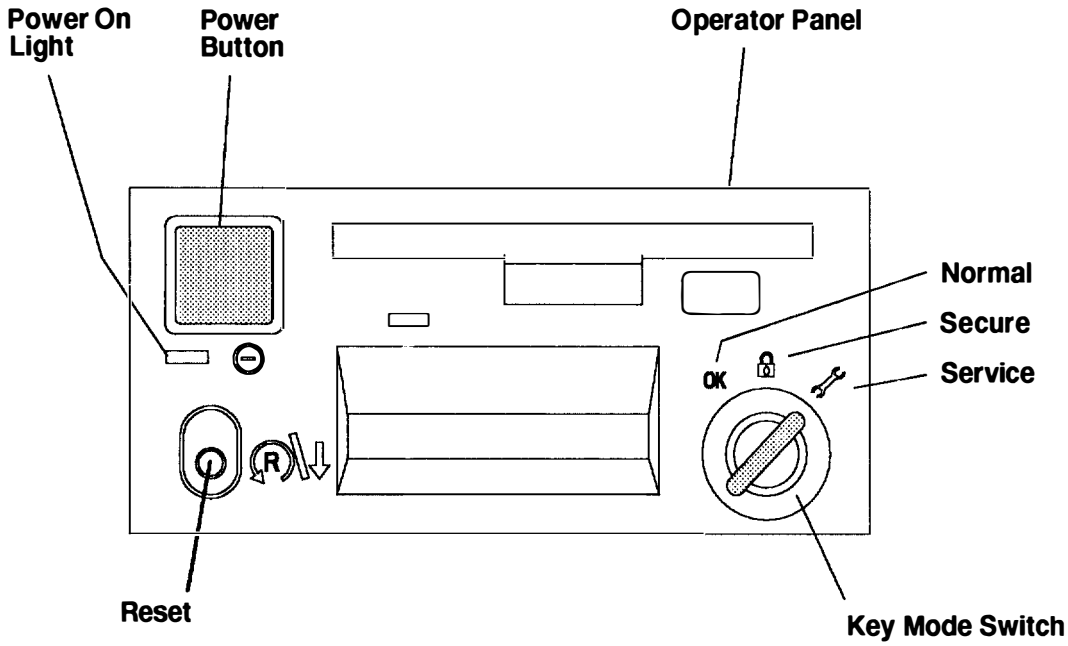
Note: Because some disk-drive-drawer locations might not contain a disk drive drawer, some circuit-breakers might not be connected to a disk drive drawer. To prevent a false reading from any attached-circuit breaker alarm, set all circuit breaker switches to the On position.

4. Ensure that all circuit breakers are on (circuit breaker switches in the up position).

Front View of Power Distribution Panel



5. Set the Power button on the operator panel of the CPU enclosure to on (button pushed in).
6. Switch on power to drawers.
7. Go to Chapter 5 of the *POWERstation and POWERserver Common Diagnostics Information Manual* and follow the instructions in the "Installation Checkout" procedure.

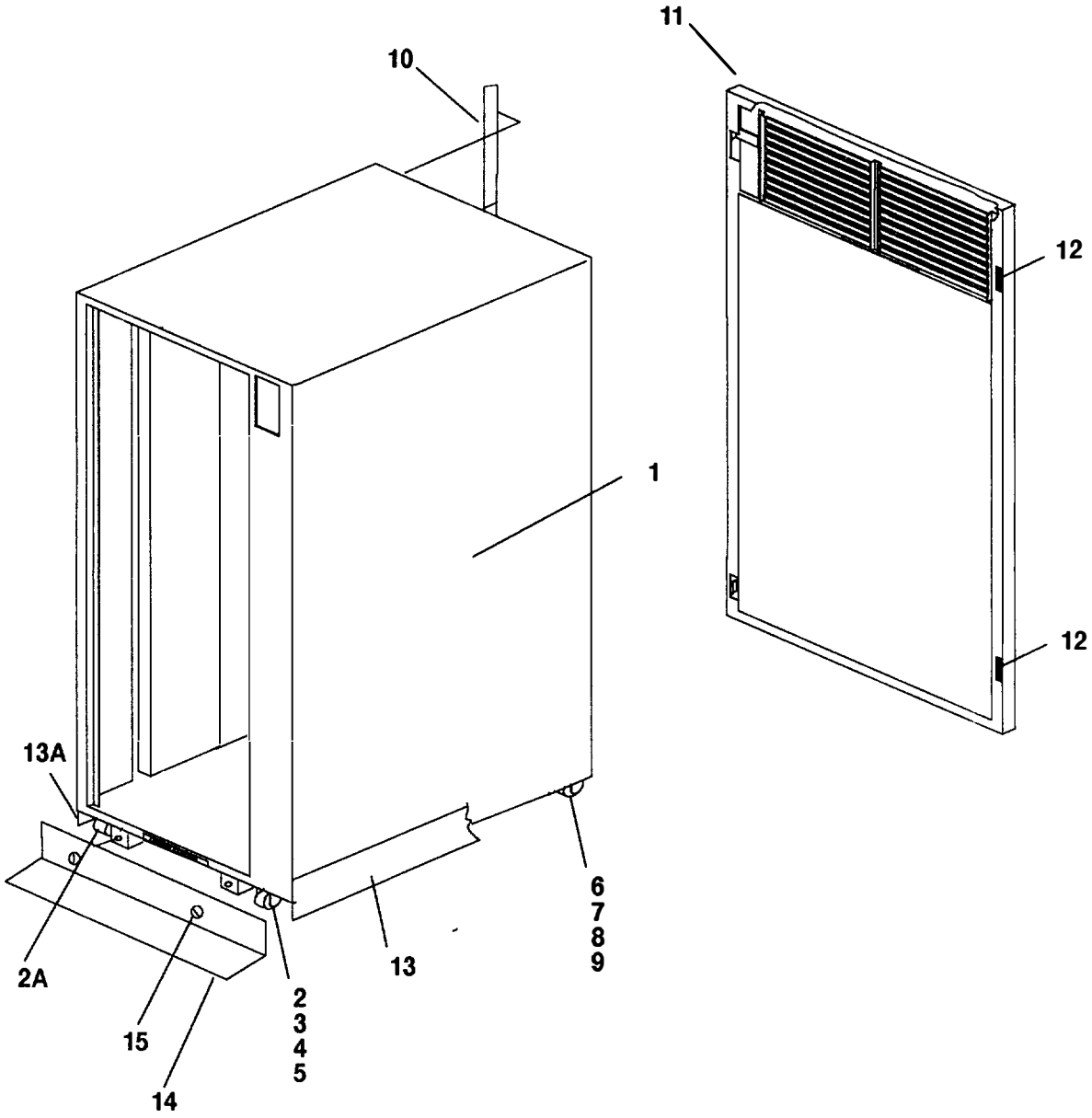


Chapter 8. Parts Information (AC Rack)

This chapter contains details showing all parts and the respective part numbers for each section of the rack.

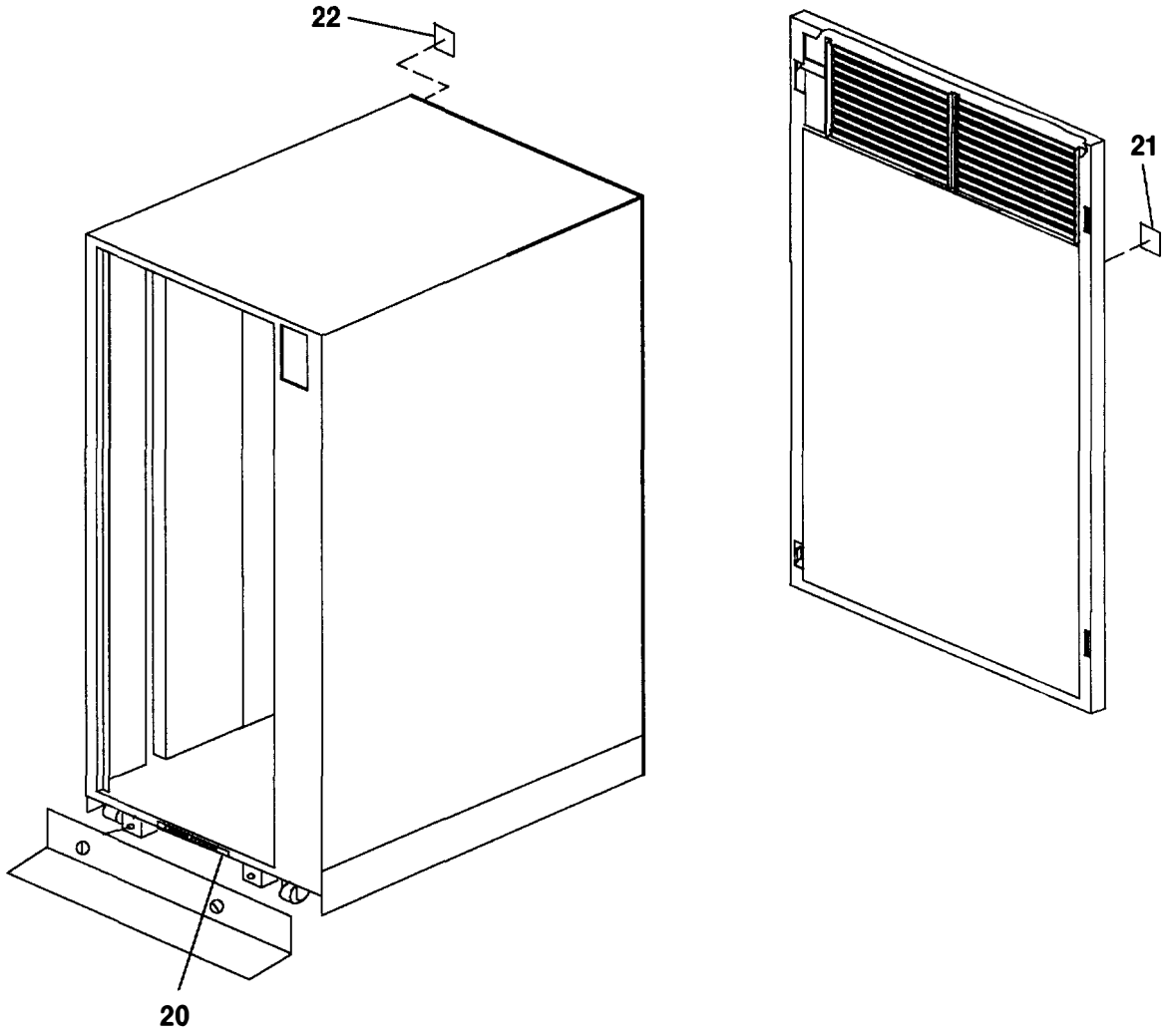
This chapter contains parts information for an AC 7015 Model R00 rack. For parts information for a -48 V dc 7015 Model R00 rack, refer to Chapter 9.

Detail 1. Covers



Index Number	Part Number	Units Per Asm	Description
1	76X3586	1	Frame and cover assembly
2	89X2628	1	Caster, (offset) right
2A	89X2627	1	Caster, (offset) left
3	1621823	8	Screw, hex Hd w/washer, self tap, M6 x 16
4	1622306	8	Washer
5	1622320	8	Lock washer
6	62X3601	2	Caster, Swivel
7	1621823	8	Screw, hex Hd w/washer, self tap, M6 x 16
8	1622306	8	Washer
9	1622320	8	Lock washer
10	62X3561	1	Label, EIA identification
11	6855092	1	Door assembly
12	6855092	2	Catch, door
13	89X2907	1	Panel assembly, acoustic right side
13A	89X2908	1	Panel assembly, acoustic left side
14	89X2841	1	Stabilizer
15	76X4687	2	Thumbscrew

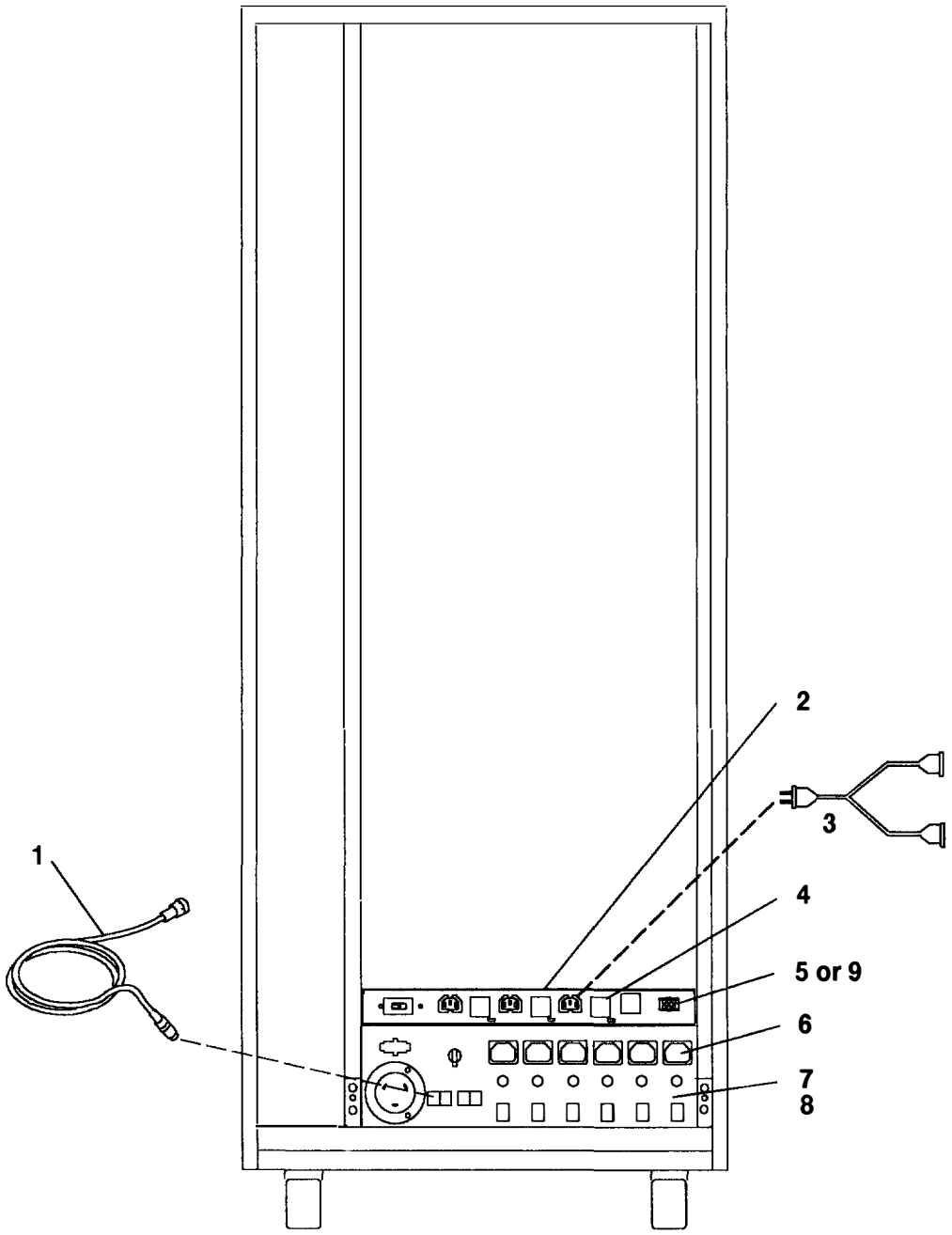
Detail 2. Labels



Index Number	Part Number	Units Per Asm	Description
20	69X1264	1	Label, safety (English)
20	62X3442	1	Label, safety (U.K./English)
20	62X3476	1	Label, safety (Spanish)
20	62X3477	1	Label, safety (Norwegian)
20	62X3478	1	Label, safety (Dutch)
20	62X3479	1	Label, safety (Finnish)
20	62X3483	1	Label, safety (Italian)
20	62X3493	1	Label, safety (German)
20	62X3531	1	Label, safety (Danish)
20	62X3532	1	Label, safety (French)
20	62X3533	1	Label, safety (French/Dutch)
20	62X3534	1	Label, safety (Japanese)
20	62X3538	1	Label, safety (Swedish)
20	69X1279	1	Label, safety (Portuguese)
20	69X1281	1	Label, safety (Italy/Germany/France)
20	69X1264	1	Label, safety (Canada/French)
21	59F3003	1	Nameplate, U.S.
21	71F0730	1	Nameplate, Italy
22	69X1262	AR	Label, rack identifier

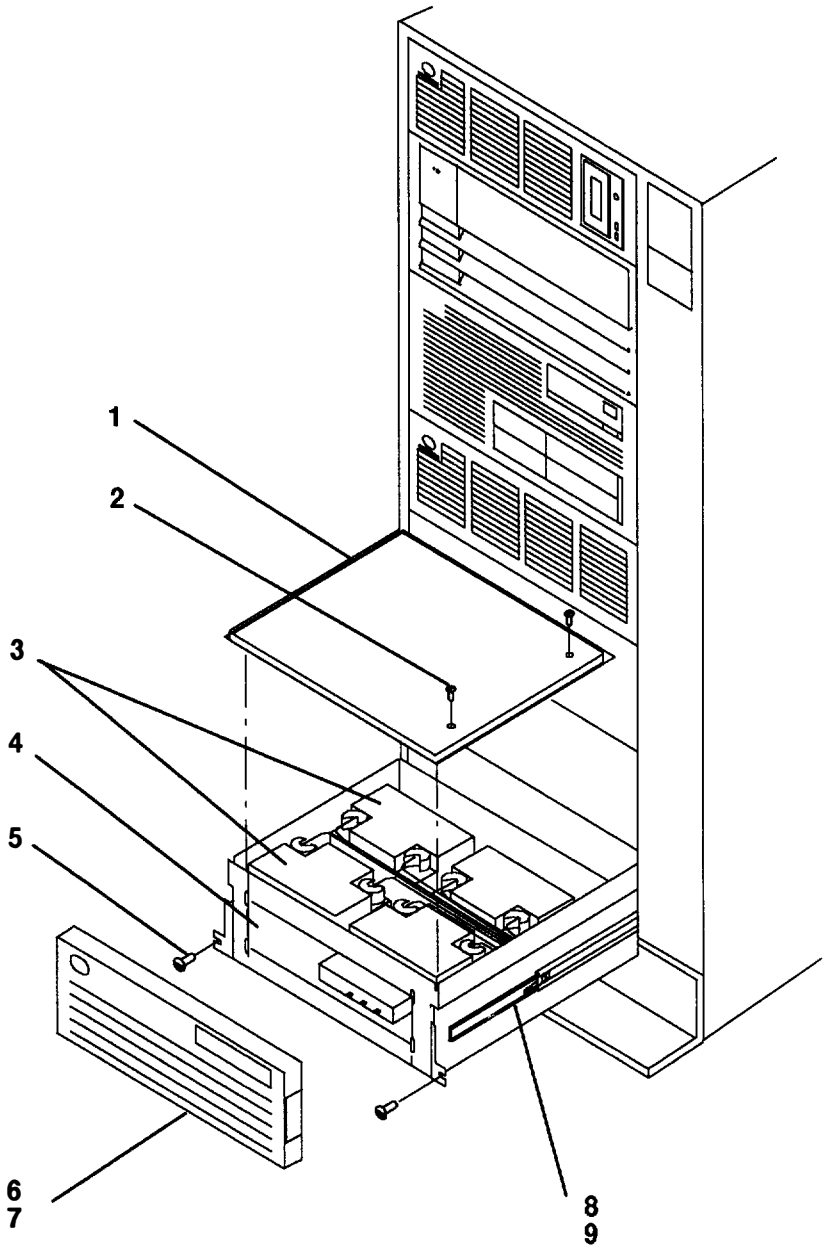
Detail 3. Power Distribution and Battery Backup Units (Rear)

Note: The battery backup unit can only be installed in a rack with the power distribution unit shown below.



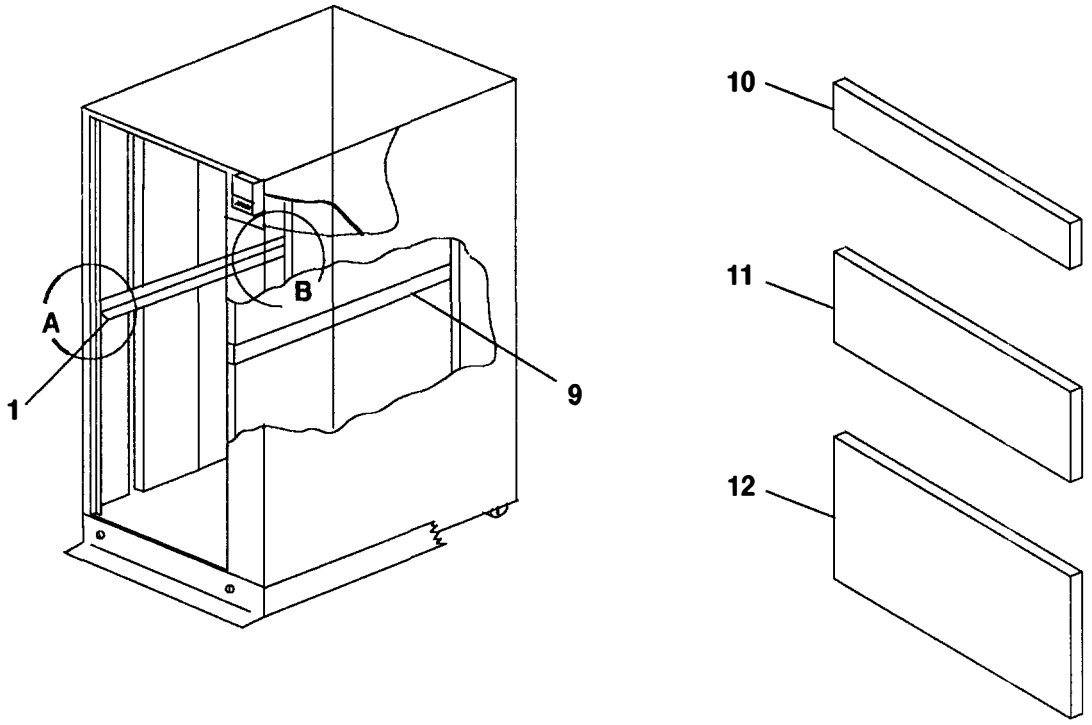
Index Number1	Part Number	Units Per Asm	Description
1	42F6839	AR	Cable, power control
2	81F8962	1	Battery backup unit (optional)
3	02G7552	1	Cable, two connector Y
4	81F9051	3	Fuse (battery backup unit)
5	42F6840	1	Cable, battery status
6	81F7728	AR	Cable, AC/DC power
7	53F3524	1	Power distribution unit, three phase
7	53F3866	1	Power distribution unit, three phase (Switzerland only)
7	42F6860	1	Power distribution unit, single phase
8	1624779	4	Screw, hex/washer hd, M5 x 14
9	40H0476	1	Battery Backup Cable for R30

Detail 4. Power Distribution and Battery Backup Units (Front)



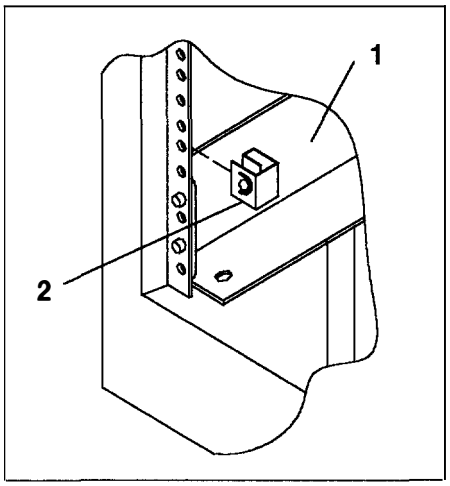
Index Number	Part Number	Units Per Asm	Description
1	59F3872	1	Top cover
2	0001944	2	Screw, 8-32 x 1/2
3	59F3876	4	Battery
4	81F8962	1	Battery backup unit (optional)
4	00G3372	1	Battery backup unit (optional)
5	1624779	2	Screw, hex/washer hd, M5 x 14
6	42F6863	1	Front cover
7	1622672	1	Screw, M3 x 10
8	59F3877	2	Slide assembly
9	0034512	4	Screw, 8-32 x 3/8

Detail 5. Rails and Front Bezels

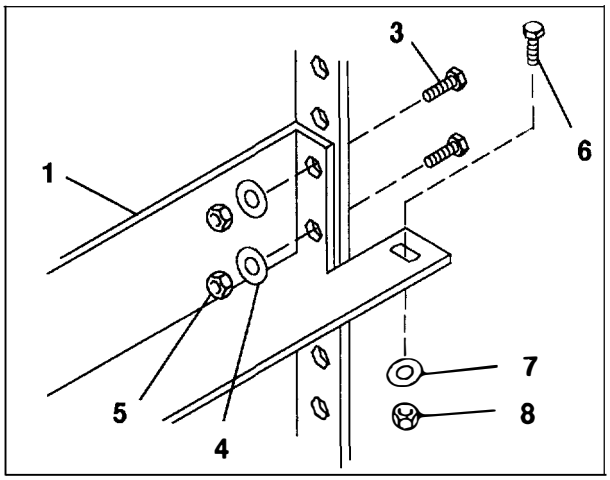


Mounting Hardware For CPU Enclosure

Detail A – Front of Rail

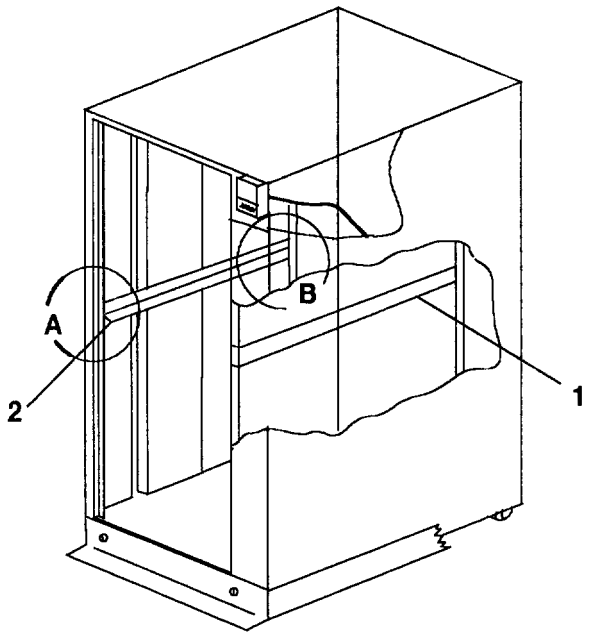


Detail B – Rear of Rail



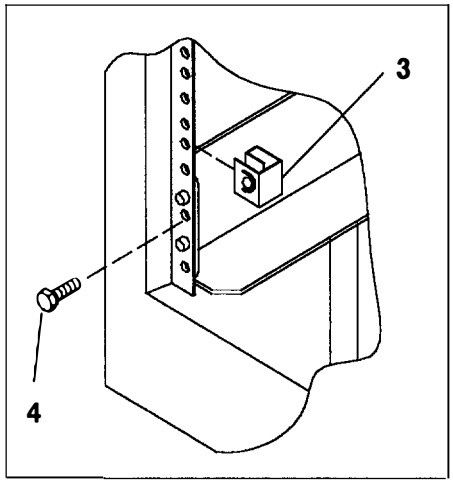
Index Number	Part Number	Units Per Asm	Description
1	02G7232	1	Rail, left
2	0375867	4	Nut clip
3	02G7295	4	Screw, rail mounting
4	1622320	4	Lock washer
5	1622405	4	Nut
6	1624779	2	Screw, CPU enclosure rear mounting
7	1622319	2	Lock washer
8	1622404	2	Nut
9	02G7263	1	Rail, right
10	62X3443	1	Front bezel (for empty drawer position), 1 EIA unit
11	62X3444	1	Front bezel (for empty drawer position), 3 EIA units
12	62X3445	1	Front bezel (for empty drawer position), 5 EIA units

Detail 6. Rails and Front Bezels

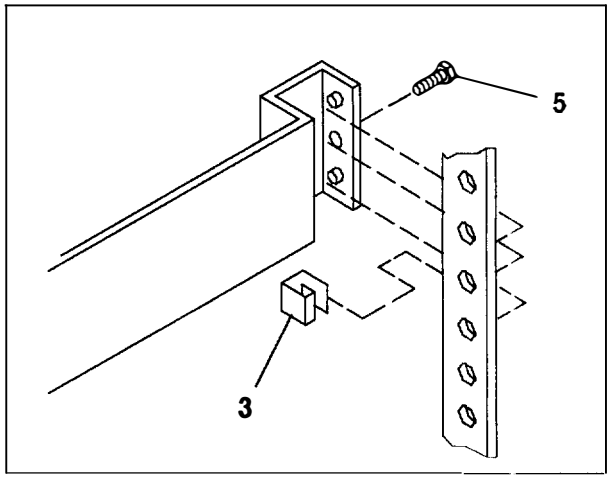


Mounting Hardware For Rack Drawers Except CPU Enclosure

Detail A – Front of Rail

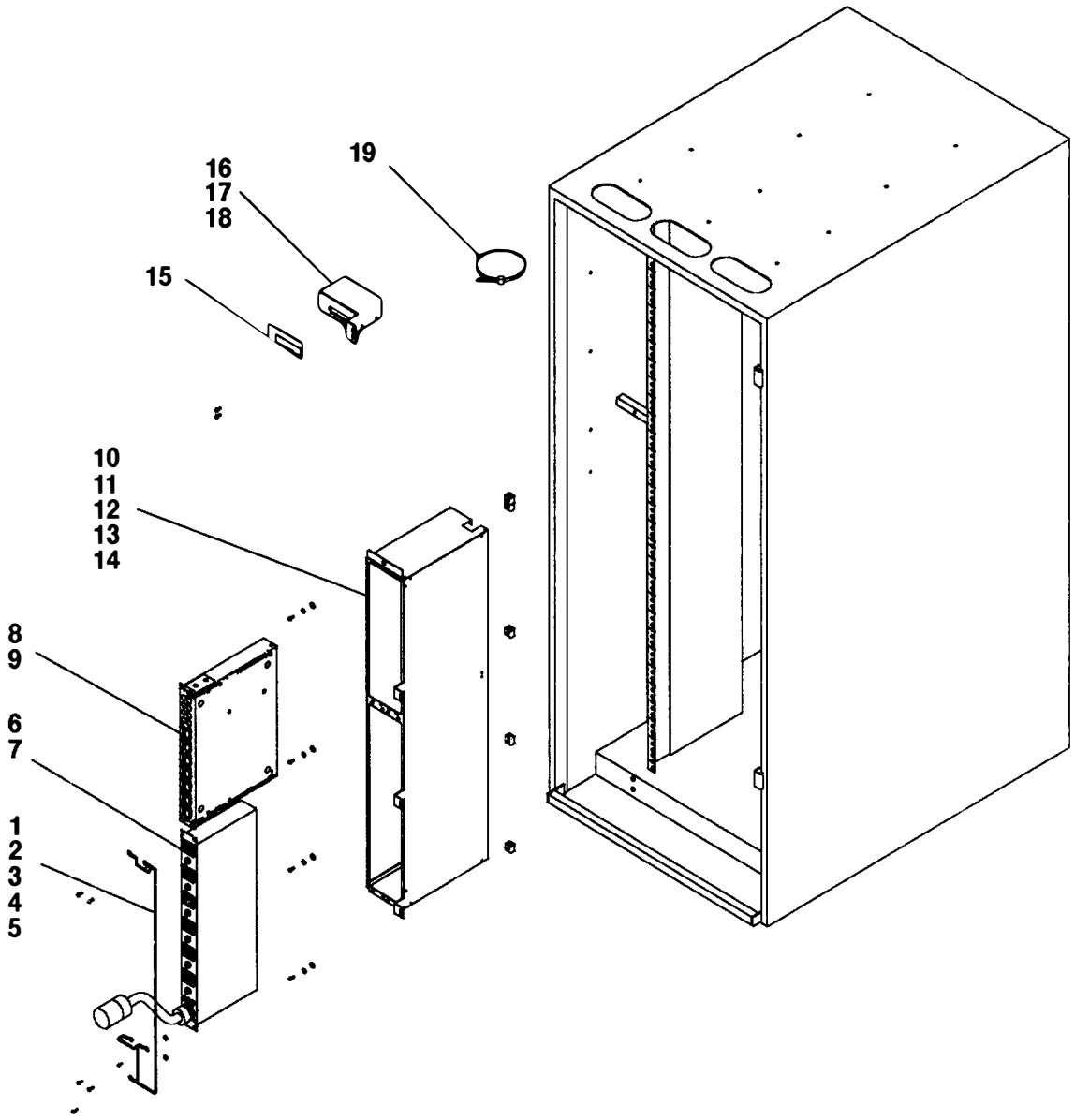


Detail B – Rear of Rail



Index Number	Part Number	Units Per Asm	Description
1	375714	1	Rail, right
2	375816	1	Rail, left
3	375867	4	Nut clip
4	1624779	2	Screw, hex/washer Hd, M5 x 14
5	1621210	2	Screw, pan Hd, M5 x 10

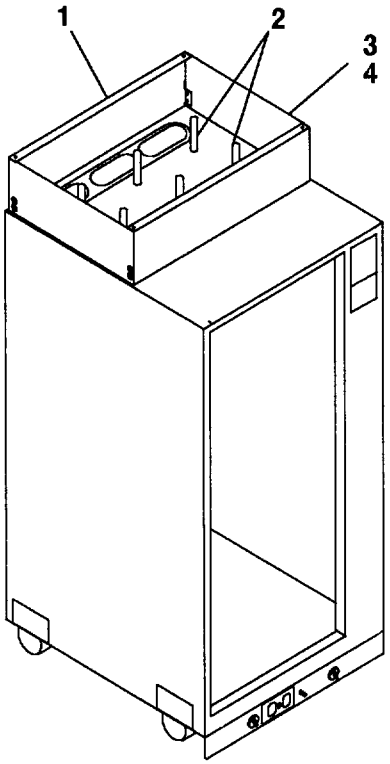
Detail 7. Power Distribution Bus and Cluster Power Control



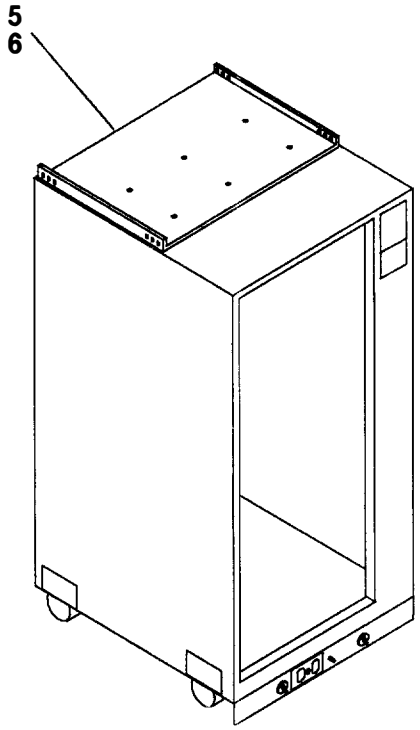
Index Number	Part Number	Units Per Asm	Description
1	88G0165	1	Ground wire harness
2	1624779	1	Screw
3	00G1268	1	Screw
4	1622347	1	Lock washer
5	1622346	1	Washer
6	52G6059	1	Power distribution bus – single phase
6	52G6060	1	Power distribution bus – two phase
6	52G6061	1	Power distribution bus – three phase (Switzerland)
7	1624779	4	Screw
8	11H2640	1	Cluster power control
9	00G1268	4	Screw
10	52G6112	1	Enclosure
11	1624779	4	Screw
12	1622347	4	Lock washer
13	1622305	4	Washer
14	375867	3	Nut clip
15	88G4777	1	Label
16	88G4776	1	Tailgate async connector
17	1624779	2	Screw
18	375867	2	Nut clip
19	32G0111		Cable restraint strap
20	81F7728		Cable, AC/DC power

Detail 8. AC 7015 Racks With Alternate Rack Features

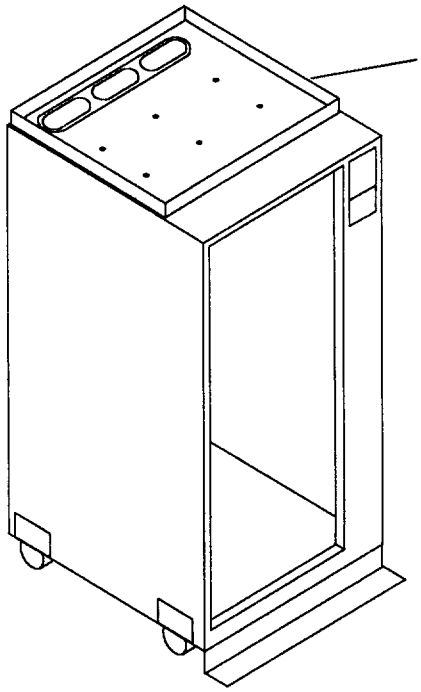
AC 7015 Rack with Cable Channel



AC 7015 Rack with Rack Attachment Plate



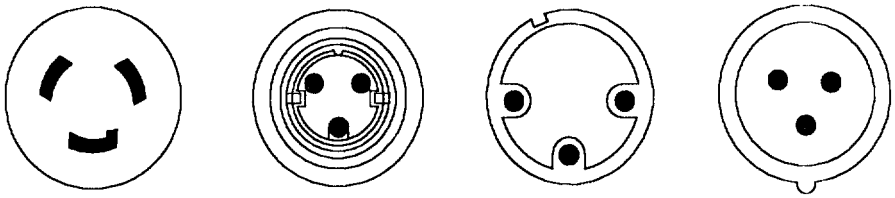
AC 7015 Rack with External Device Container



Index Number	Part Number	Units Per Asm	Description
1	65G3418	1	Cable channel
2	52G5654	6	Cable separators
3	52G5652	2	Side cover (cable channel)
4	1673985	4	Screw,
5	52G1606	1	Rack attachment plate
6	1621230	8	Screw
7	52G1605	1	External device container
8	1621230	6	Screw

Power Cords

Plug Types



1 2 3 4

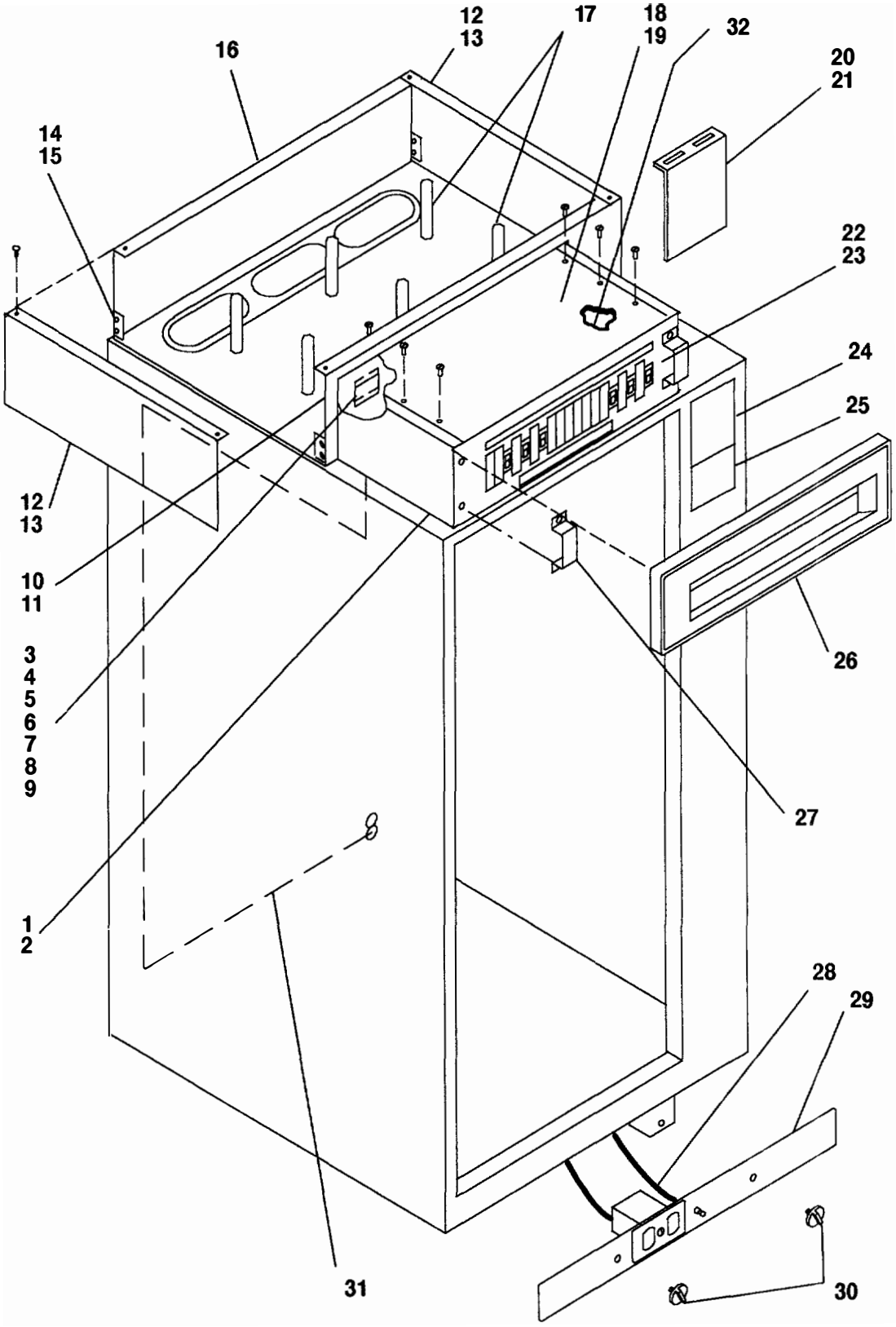
Index Number	Part Number	Units Per Asm	Country
1	11F0113	1	Canada, U.S.A.
1	11F0114	1	Chicago, Illinois, U.S.A.
1	11F0115	1	Argentina, Bahamas, Bangladesh, Barbados, Bermuda, Bolivia, Brunei, Chile, Columbia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Hong Kong, India, Indonesia, Jamaica, Japan, Korea, Maco, Malaysia, Mexico, Myanmar, Netherlands Antilles, Panama, Peoples Republic of China, Peru, Philippines, Singapore, Sri Lanka, Suriname, Uruguay, Venezuela
2	11F0116	1	Canada, U.S.A. (weatherproof)
2	11F0117	1	Chicago, Illinois, U.S.A. (weatherproof)
3	11F0106	1	Australia
3	11F0107	1	New Zealand
4	42F6678	1	Belgium, Bahrain, Egypt, France, Greece, Iceland, Iraq, Ireland, Italy, Jordan, Kuwait, Lebanon, Malawi, Norway, Oman, Portugal, Qatar, Saudi Arabia, Spain, Turkey, U.K., United Arab Emirates

Chapter 9. Parts Information (–48 V dc Rack)

This chapter contains detailed drawings, part numbers, and part descriptions for a –48 V dc 7015 Model R00 rack.

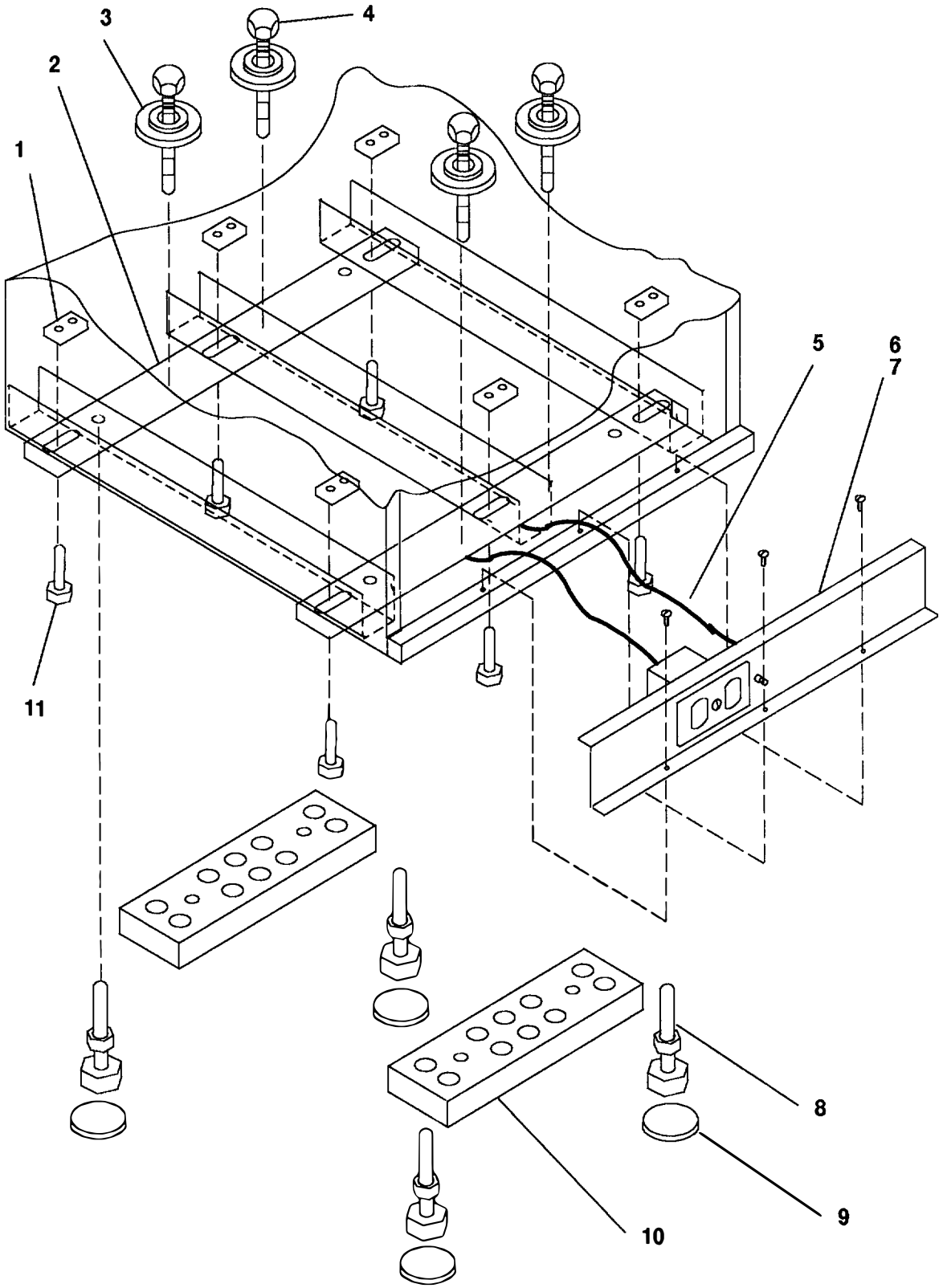
For parts information for an AC 7015 Model R00 rack, refer to Chapter 8.

Detail 1. Cable Channel and Power Distribution Panel



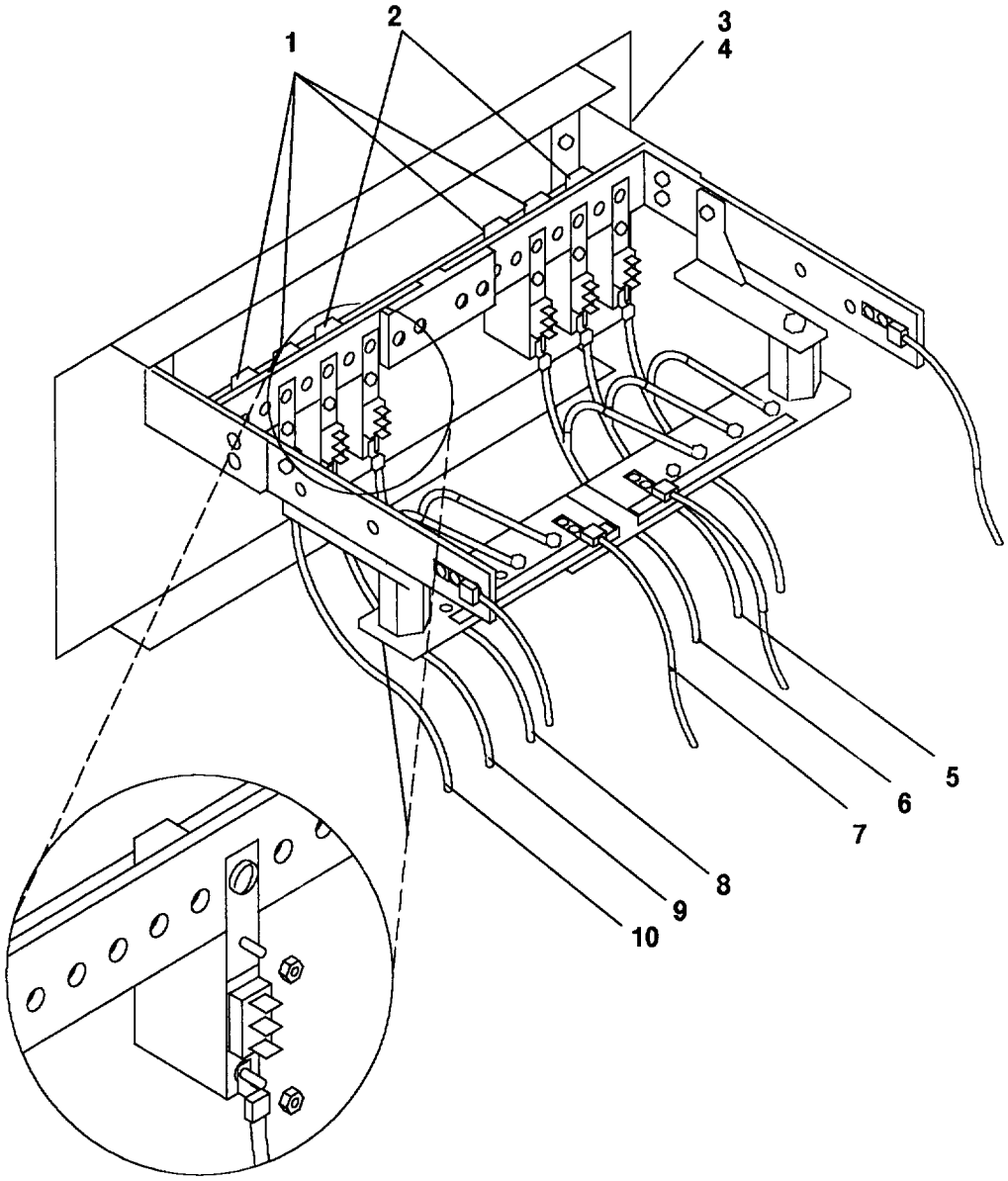
Index Number	Part Number	Units Per Asm	Description
1	65G3415	1	Chassis (power distribution panel)
2	1621230	4	Screw, M6 x 12
3	322766	2	Terminal board, eight positions
4	126036	1	Marker strip
5	191480	1	Shield
6	210883	1	Stud
7	210884	3	Stud
8	10170	1	Screw
9	65G6945	1	Resistor
10	88G4724	1	Rear cover (power distribution panel)
11	1621230	4	Screw, M6 x 12
12	52G5652	2	Side cover (cable channel)
13	1624779	4	Screw, M5 x 14
14	1621235	8	Screw, M6 x 35
15	1622405	8	Nut, M6
16	65G3418	1	Cable channel
17	52G5654	6	Cable separators
18	65G3416	1	Top cover (power distribution panel)
19	1621191	6	Screw, M4 x 10
20	52G5653	1	Connector plate
21	1624779	2	Screw, M5 x 14
22	8185538	1	Power distribution panel and chassis assembly
23	1621230	4	Screw, M6 x 12
24	52G5478	1	Bezel (IPO switch)
25	52G5480	1	Bezel (blank IPO switch cover)
26	65G3443	1	Bezel (power distribution panel)
27	88G4738	2	Bracket assembly
28	40HO455	1	Ground cable
29	88G4866	1	Mounting plate (front electrical outlet)
30	76X4687	2	Thumbscrew
31	40H0456	1	Ground cable
32	88G4824	1	Bus bar shield

Detail 2. Leveling Feet and Rear Outlet Mounting Plate



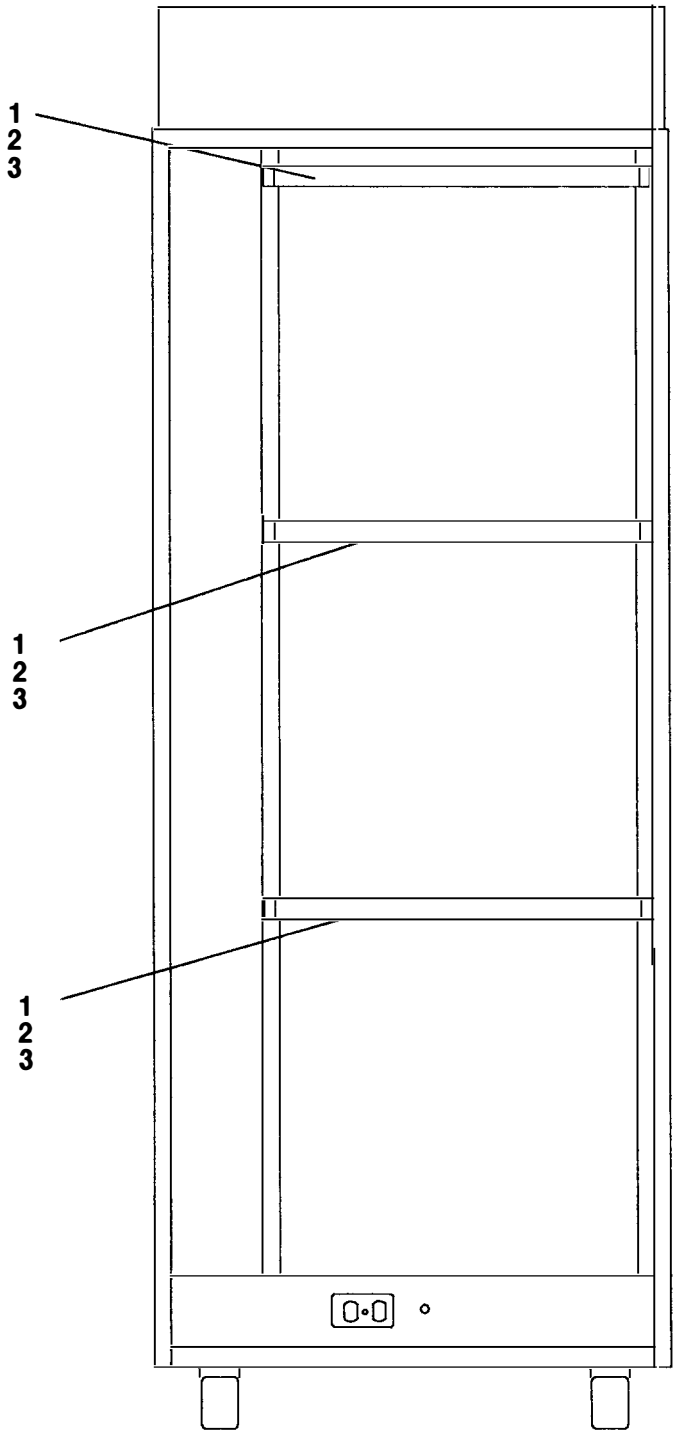
Index Number	Part Number	Units Per Asm	Description
1	52G5648	6	Screw plate
2	52G5647	2	Mounting bracket (leveler foot)
3	65G3593	4	Plastic isolator washer, 15.8 mm
4	88G4725	4	Rack mounting bolts,
5	40H0455	1	Ground cable
6	88G4850	1	Mounting plate (rear electrical outlet)
7	1624779	3	Screw, M5 x 14
8	52G6058	4	Leveler foot
9	88G4727	4	Plastic isolator pad
10	52G5650	2	Mounting plates
11	0059681	6	Mounting bolt, 1/2–13 x 1 1/2

Detail 3. Circuit Breaker



Index Number	Part Number	Units Per Asm	Description
1	8185536	4	Circuit breaker (10 amps) CPU rack only
1	8185536	6	Circuit breaker (10 amps) Expansion rack only
2	8185537	2	Circuit breaker (50 amps) CPU rack only
3	8185538	1	Power distribution panel
4	1621230	4	Screw, M6 x12
5	65G3494	1	Cable (to CB in position A1) 7015–R24 only
5	11H8297	1	Cable (to CB in position A1) 7015–R30 only
5	11H8318	1	Cable (to CB in position A1) rack without CPU
6	65G3496	1	Cable (to CB in position A3)
7	65G3497	1	Cable (to CB in position A5)
8	65G3494	1	Cable (to CB in position B1) 7015–R24 only
8	11H8297	1	Cable (to CB in position B1) 7015–R30 only
8	11H8318	1	Cable (to CB in position B1) rack without CPU
9	65G3496	1	Cable (to CB in position B3)
10	65G3497	1	Cable (to CB in position B5)

Detail 4. Cable Restraint Mounting Brackets

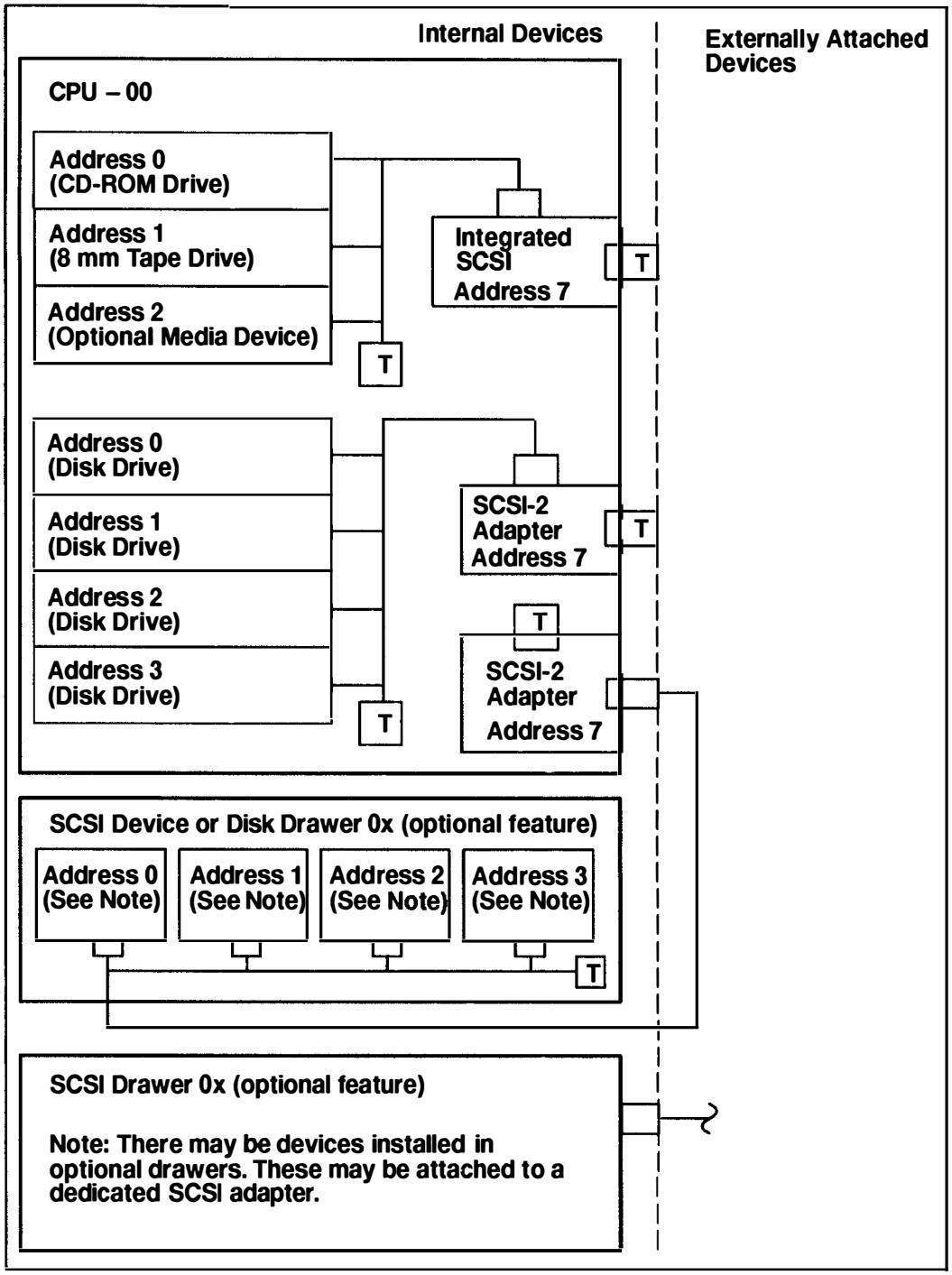


Index Number	Part Number	Units Per Asm	Description
1	52G5712	3	Cable restraint mounting bracket
2	0375867	6	Nut, clip–rail
3	1624779	6	Screw, hex Hd w/washer, M5 x 14

Appendix A. SCSI Device Address Record

Internally Installed SCSI Device Record – 7015 CPU Enclosure

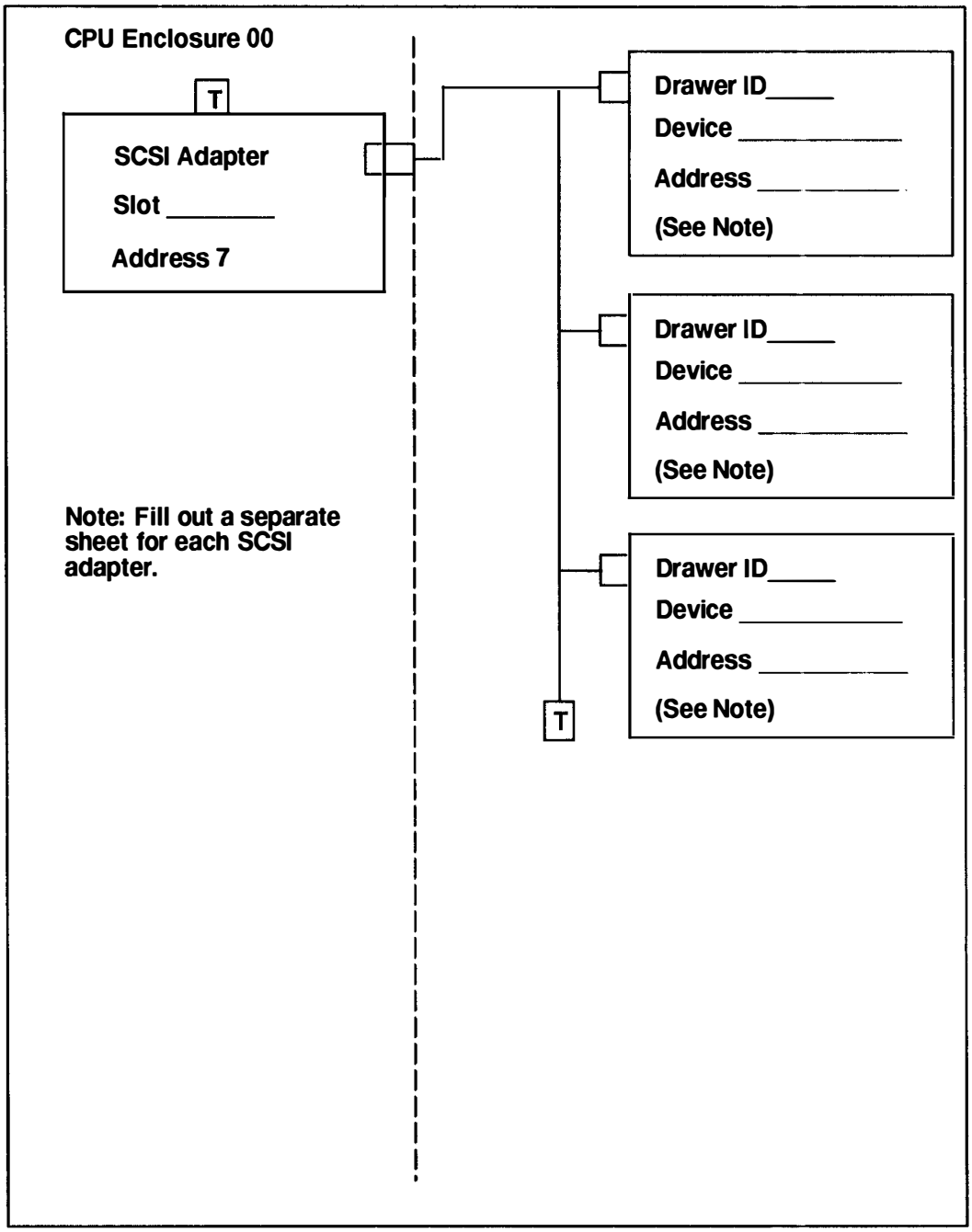
1. Use the "About Your Machine" printout to determine which devices are installed in your system unit.
2. Go to "Attached SCSI Device Record" on the following page.



Note: Some SCSI devices may require two SCSI addresses. The total number of SCSI addresses per SCSI bus, including the SCSI adapter, cannot exceed eight (0–7) SCSI addresses.

Attached SCSI Device Record

Record the adapter slot number, the drawer ID, the type of device, and the SCSI address for each attached SCSI device.



Note: Some SCSI devices may require two SCSI addresses. The total number of SCSI addresses per SCSI bus, including the SCSI adapter, cannot exceed eight (0–7) SCSI addresses.

Index

R

S

T

U

Symbols

Numbers

Printed in the U.S.A.

40H0790

SA23-2744-01