



Doc. No. 78-4954-03

Cisco 12008 Gigabit Switch Router AC-Input Power Supply Replacement Instructions

Product Number: PWR-GSR8-AC=, PWR-GSR8-AC-B=
Document Order Number: DOC-784954=

This document presents procedures for adding, removing, or replacing an AC-input power supply for the Cisco 12008 Gigabit Switch Router (GSR). It contains the following sections:

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- Verifying the Installation of a Power Supply, page 13
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Use this document in conjunction with the *Cisco 12008 Gigabit Switch Router Installation and Configuration Guide* (document number 78-4953-01), which is shipped with your Cisco 12008 GSR.

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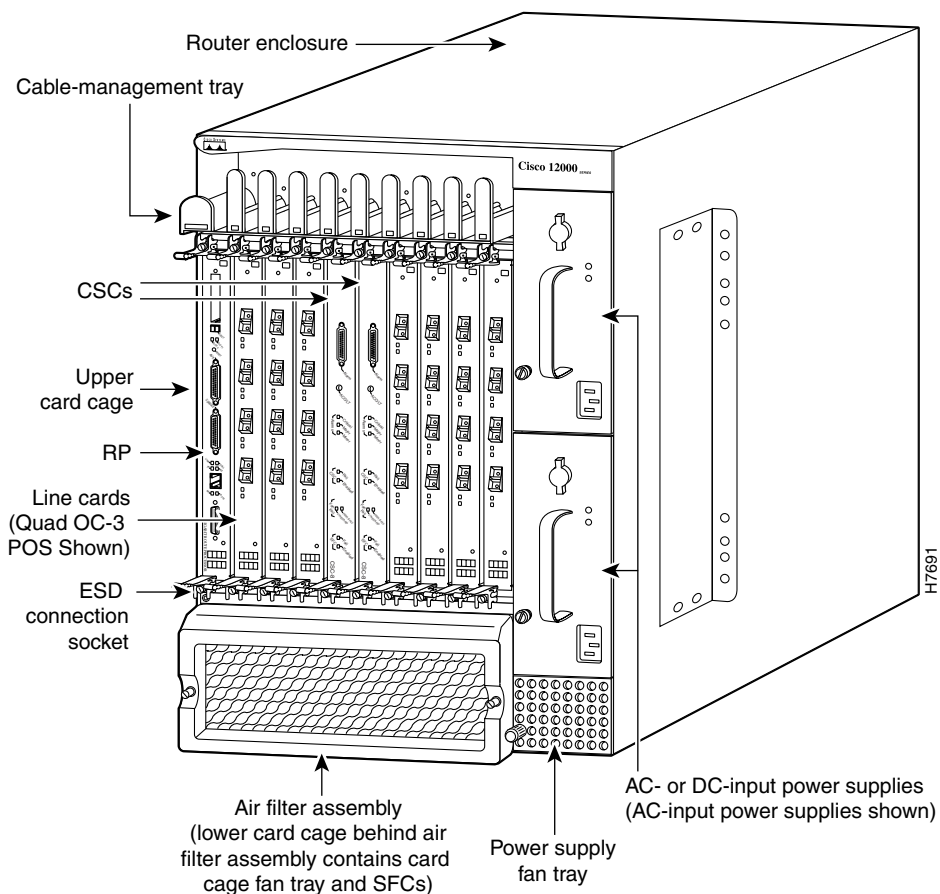
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Installation Safety and ESD Precautions

Before beginning the AC-input power supply installation/replacement procedures for the Cisco 12008 GSR router, review the safety guidelines in this section to prevent injury to yourself or damage to the equipment. This section also lists the tools that you will need to perform the installation/replacement procedures.

Figure 1 is a representation of the Cisco 12008 GSR router.

Figure 1 Front View of the Cisco 12008 GSR



Safety Guidelines

The following list does not identify all the potentially hazardous conditions that you may encounter in the workplace; accordingly, you should be alert at all times and exercise care when working with the router's electrical and electronic components.

To ensure your safety and to protect the equipment, observe the following general guidelines:

- Always disconnect all power cables and network interface cables before moving the router.
- Keep tools and router components away from walkway areas.
- Do not work alone if potentially hazardous conditions exist in your working environment.

- Do not take any action that poses a potential hazard to yourself or other personnel, or makes the equipment unsafe.
- Carefully examine your work area for possible hazards, such as damp floors, ungrounded power extension cables, and missing safety grounds.

Safety with Electricity

Observe the following electrical safety guidelines when working with the electrical and electronic components of the router:

- Locate the emergency power-off switch for the room in which you will be working.
- Disconnect all power cables and external network interface cables before moving the router.
- Do not work alone if potentially hazardous conditions exist in your working environment.
- Never assume that power has been disconnected from the router; always verify that power has been removed from the router or any circuit that you intend to access.
- Carefully examine your work area for possible hazards, such as damp floors, ungrounded power extension cables, and missing safety grounds.

In addition, observe the following guidelines when working with equipment connected to telephone wiring or other network cabling.



Warning Do not work on the system or connect/disconnect cables during an electrical storm.

- Never install telephone jacks in wet locations, unless the jack is specifically designed for such use.
- Never touch uninsulated telephone wires or terminals, unless the telephone line is disconnected at the network interface.
- Use caution when installing or modifying telephone lines.



Warning Before working on the router, disconnect all telephone network cables to avoid exposure to network voltages.

Preventing Electrostatic Discharge (ESD) Damage

Electrostatic discharge (ESD) damage to circuit boards and electronic components can occur if they are touched or handled improperly. ESD damage can result in intermittent or complete failure of electronic components.

To prevent ESD damage to router components, observe the following guidelines:

- Always wear an ESD-preventive wrist strap when handling router components; ensure that the strap makes ample contact with your skin.

The wrist strap only protects circuit boards and electronic components from ESD voltages present on the body; ESD voltages can also be present on clothing, causing ESD damage to electronic components.

Note It is good practice to periodically check the resistance value of the antistatic wrist strap. The resistance measurement should be between 1 and 10 megohms.

- If you intend to return a removed circuit board to the factory for repair or replacement, immediately store the board in a static shielding bag or place it in an antistatic rack for ESD protection. Prepare the package properly for return shipment.

Required Tools

To install or replace an AC-input power supply, you will need the following:

- 1/4-inch flat-blade screwdriver (to loosen/tighten the captive installation screw on the power supply faceplate)
- A replacement AC-input power supply (Product Number PWR-GSR8-AC= or PWR-GSR8-AC-B=) and the applicable AC power cord for your site

AC-Input Power Supply Requirements

Before you begin the procedure of replacing/installing the AC-input power supply for your Cisco 12008 GSR, you must verify which power supply you will need based on the type of line cards that are installed in your Cisco 12008 GSR.

In order to be able to use the 4-port POS OC-12/STM-4 line card in the Cisco 12008 GSR, the AC-input power supply must have the Product Number PWR-GSR8-AC-B.

If the AC-input power supply hardware part number is 34-0820-01, you must upgrade the AC-input power supply to the power supply with the Product Number PWR-GSR8-AC-B. All other line cards fit the requirements of the power supply with the hardware Part Number 34-0820-01 and Product Number PWR-GSR8-AC.

There are two ways in which you can verify the type of AC-input power supply that is installed in your Cisco 12008 GSR:

- Verifying the Power Supply Using the Hardware Label, page 4
- Verifying the Power Supply Using the show diags Command, page 4

Verifying the Power Supply Using the Hardware Label

To verify the type of power supply installed in your Cisco 12008 GSR, locate the product number on the faceplate of the power supply. (See Figure 3.)

Verifying the Power Supply Using the **show diags** Command

Enter the **show diags** command to verify the type of AC-input power supply installed in the router. Line 3 and line 23 of the following example are called out with arrows to indicate where the hardware part number and product number are located. In this example, the AC-input power supply with the Product Number PWR-GSR8-AC is installed.

```
router# show diags
SLOT 26 (PS B1 ):AC Power Supply(8)
→ MAIN:type 3, 34-0820-01 rev C0 dev 16777215
HW config:0xFF SW key:FF-FF-FF
PCA:65535-16777215-255 rev V7 ver 255
```

```

HW version 1.0 S/N CAT00240269
MBUS:MBUS Agent (1) 73-2146-07 rev B0 dev 0
HW version 1.2 S/N CAT00240269
Test hist:0xFF RMA#:FF-FF-FF RMA hist:0xFF
DIAG:Test count:0xFFFFFFFF Test results:0xFFFFFFFF
EEPROM contents (hex):
00:01 00 01 00 00 49 00 08 62 07 58 00 00 00 FF FF FF
10:43 41 54 30 30 32 34 30 32 36 39 00 00 00 00 00
20:01 02 00 00 00 00 00 00 FF FF FF FF FF FF FF FF
30:A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5 A5
40:00 03 01 00 FF FF FF FF FF FF FF FF 00 05 FF FF
50:00 22 00 03 34 01 60 FF FF FF FF FF FF FF FF
60:43 41 54 30 30 32 34 30 32 36 39 00 00 00 00 00
70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
80:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
90:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
A0:00
→ FRU:Linecard/Module:PWR-GSR8-AC=
  MBUS Agent Software version 01.46 (RAM) (ROM version is 01.33)
  Using CAN Bus A

```

Power Supply Electrical Specifications

Electrical specifications of the AC-input power supplies are presented in Table 1.

Table 1 Electrical Specifications of the AC-Input Power Supply

Electrical Characteristics	Value
Input power	Maximum: 2000W 200 VAC to 240 VAC at 10A
Input voltage	Nominal: 200 VAC to 240 VAC, single phase Tolerance limits: 180 VAC to 264 VAC
Input current	9.5A at 200 VAC
Line frequency	47 to 63 Hz
Output power	Maximum: 1560W -48 VDC at 33.7A +5.2 VDC at 20.8A

Adding, Removing, or Replacing an AC-Input Power Supply

The Cisco 12008 GSR can operate with either one or two AC-input power supplies. Although the router supports an online insertion and removal (OIR) capability for field replaceable units (FRUs), you must observe the following rules regarding the AC-input power supplies:

- If your Cisco 12008 GSR is configured with a single AC-input power supply, you must power down the system before replacing the unit.
- If your Cisco 12008 GSR is configured with two AC-input power supplies, you can remove and replace one of the power supplies while the other unit continues to supply power to the router.

The AC-input power supplies for the Cisco 12008 Gigabit Switch Router provides the following operating voltages to the router backplane:

- +5.2 VDC
- -48 VDC

The AC-input power supplies (see Figure 2) has the following characteristics:

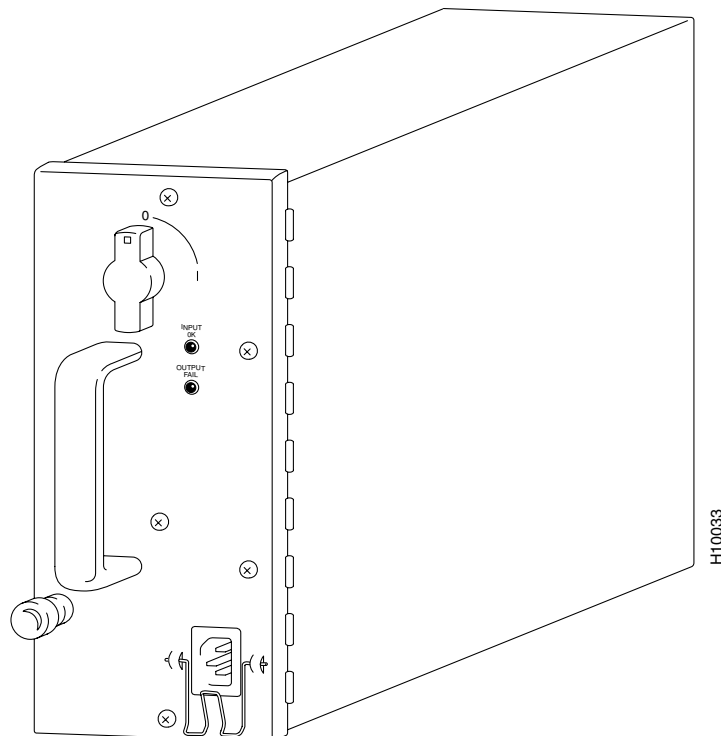
- Width of power supply body—3.5 inches (8.97 cm)
- Width of power supply faceplate—4.0 inches (10.26 cm)
- Height—10 inches (25.64 cm)
- Depth—17.6 inches (45.13 cm)
- Weight—17 lb (7.73 kg)
- Power factor corrector (PFC)—The PFC enables the power supply to accept source AC voltages with the following characteristics: voltages ranging from 180 to 264 VAC, single phase, 47 to 63 Hz.

Note You should not install two AC-input power supplies unless you intend to use both units. In other words, powering the router with a single power supply while using the other bay to temporarily or indefinitely “store” an inert unit may disrupt the normal flow of cooling air through the router.



Caution You cannot use an AC-input power supply and a DC-input power supply in the same chassis.

Figure 2 AC-Input Power Supply (PWR-GSR8-AC and PWR-GSR8-AC-B)



For additional information about the AC-input power supply, refer to the document entitled *Cisco 12008 Gigabit Switch Router Installation and Configuration Guide* (document number 78-4953-01).

The following sections present the procedures for adding, removing, or replacing an AC-input power supply.

Adding a Power Supply

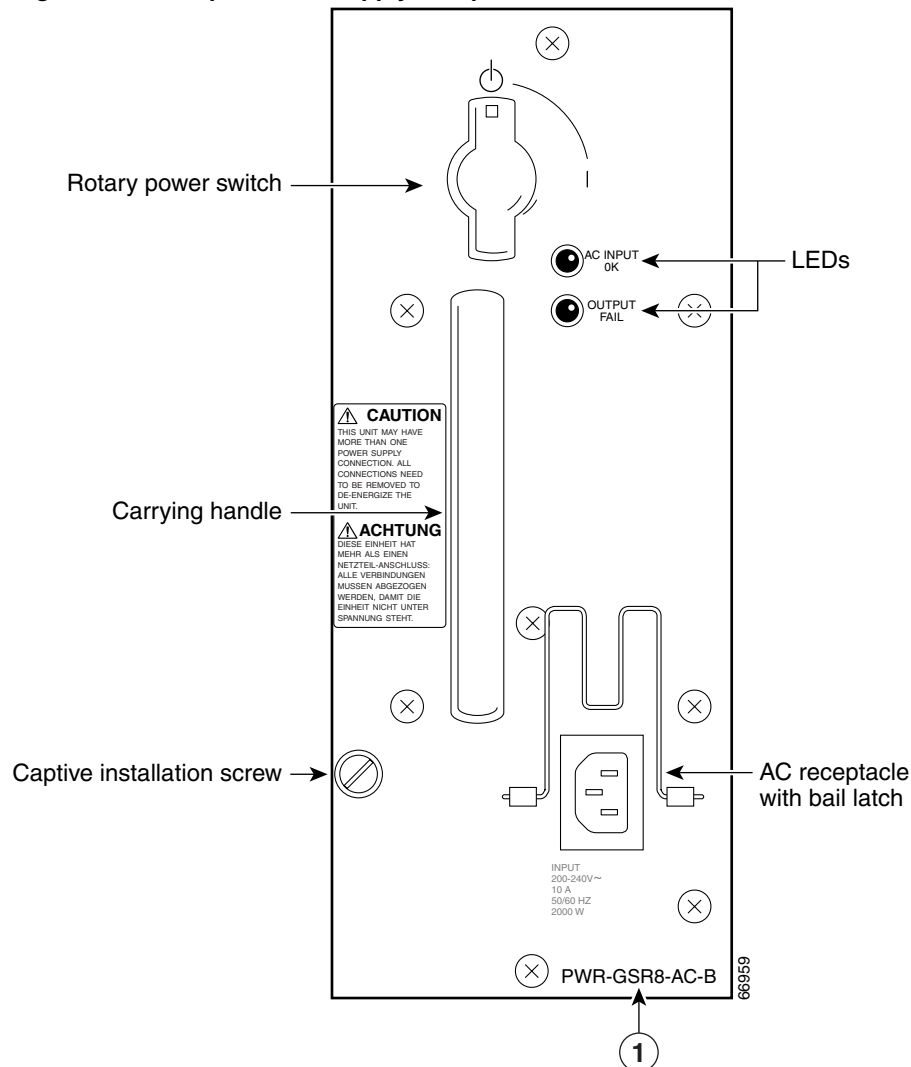
In the following procedure, it is assumed that you will be adding a second (redundant) AC-input power supply to the router. In this case, it is also assumed that a blank filler panel is installed in the vacant power supply bay.

Note A vacant power supply bay must always be covered with a blank filler panel to ensure EMI compliance and the proper flow of cooling air through the router.

Note It is recommended that you connect each AC-input power supply to an independent source of power with a 20A service. It is also recommended that you use an uninterruptable power source (UPS) for your site to protect against a site power failure.

The functional elements of the PWR-GSR8-AC= and the PWR-GSR8-AC-B= AC-input power supplies are shown in Figure 3.

Figure 3 AC-Input Power Supply Faceplate



1	Cisco 12008 GSR power supply product number
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To add a second (redundant) AC-input power supply to the router, perform the following steps:

Step 1 Locate the source AC circuit breaker that will service the AC-input power supply; ensure that this circuit breaker is set to the OFF position.

For added safety, tape the circuit breaker handle in the OFF position.

Step 2 Using a 1/4-inch flat-blade screwdriver, loosen the captive installation screw on the blank filler panel covering the vacant (upper) power supply bay; remove the filler panel and retain it for possible future use.

Presumably, you will install the new power supply in the upper power supply bay, since, by convention, a single AC-input power supply is installed in the lower bay.

- Step 3** Ensure that the rotary power switch on the faceplate of the new power supply that you intend to install is set to the standby (OFF) position (see Figure 3).
- Step 4** Grasp the carrying handle on the new power supply with one hand; while lifting the power supply, place your free hand beneath the unit to support its weight.



Warning The AC-input power supply weighs 17 lb (7.73 kg). For safety, use both hands to install the unit in the power supply bay.

- Step 5** Position the power supply appropriately for insertion into the vacant upper bay.
- Step 6** Gently slide the unit into the bay, carefully seating it so that the power supply faceplate rests flush against the sheet metal of the power supply bay.

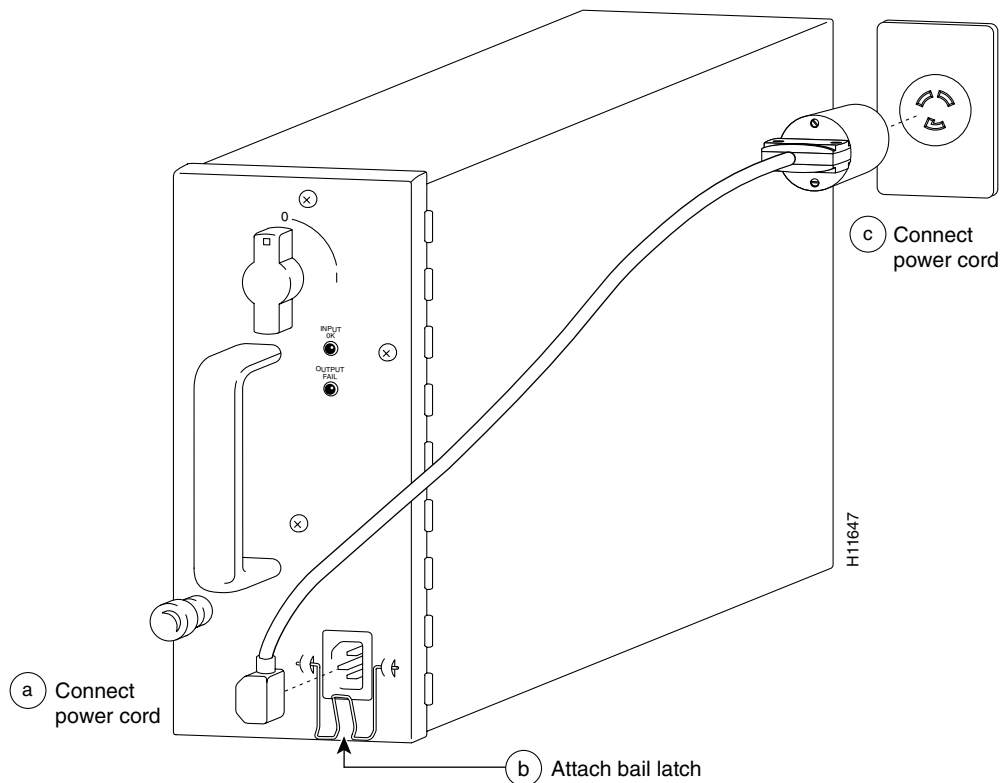


Caution To prevent damage to the blind-mating connector at the rear of the power supply, do not use excessive speed or force when inserting the power supply into the bay.

Note All necessary electrical connections between the power supply and the backplane are accomplished automatically by means of the blind-mating connector at the rear of the power supply.

- Step 7** Using a 1/4-inch flat-blade screwdriver, tighten the captive installation screw on the faceplate of the power supply (see Figure 3).
- Step 8** Connect the source AC power cord to the AC receptacle on the power supply faceplate and secure the bail latch (see Figure 4) over the source AC power cord.
- Step 9** Connect the other end of the source AC power cord to its power source, as shown in Figure 4.
- Step 10** Set the rotary power switch on the new AC-input power supply to the ON (1) position.
- To verify that the new AC-input power supply is operating properly, proceed to the section entitled “Verifying the Installation of a Power Supply,” page 13.

Figure 4 Connecting Power to an AC-Input Power Supply



Removing a Power Supply

For the following procedure, it is assumed that you will remove an AC-input power supply from a Cisco 12008 that is equipped with a single such unit. In this case, you must power down the router before removing the power supply.

It is also assumed that the power supply to be removed is installed in the lower power supply bay, which, by convention, is the normal configuration for a single power supply.

Lastly, in such a single power supply configuration, it is assumed that the vacant upper power supply bay has previously been covered by a blank filler panel to ensure EMI compliance and the proper flow of cooling air through the router. However, if such is not the case, it is recommended that you either install a second (redundant) power supply in the vacant bay or cover it with a blank filler panel.

To remove the AC-input power supply from the router, perform the following steps:

Step 1 Set the rotary power switch on the power supply faceplate to the standby (OFF) position.

Note Turning the power supply switch counterclockwise to the standby (OFF) position releases the mechanical interlock (latching mechanism) that secures the power supply in the bay.

- Step 2** Locate and turn off the source AC circuit breaker that is currently servicing the AC-input power supply.
- Step 3** Tape the circuit breaker handle in the OFF position as an added safety precaution.
- Step 4** Release the bail latch that secures the source AC power cord to the AC receptacle on the power supply faceplate.
- Step 5** Disconnect the source AC power cord.
- Step 6** Using a flat-blade screwdriver, loosen the captive installation screw on the power supply faceplate that secures the power supply within the bay.
- Step 7** With one hand, grasp the power supply carrying handle and pull the unit halfway out of the bay to disengage the female blind-mating connector at the back of the power supply from the backplane.



Warning The AC-input power supply weighs 17 lb (7.73 kg). For safety, use both hands to remove the unit from the power supply bay.

- Step 8** Place your free hand beneath the power supply to support its weight; withdraw the unit completely from the bay.
- Step 9** Set the power supply aside in a safe place, pending further disposition.

If you intend to return the removed power supply to the factory for repair or replacement, repackage the unit properly for return shipment using the original packing materials, if available.

Replacing an Existing Power Supply

For the following procedure, it is assumed that you will remove an AC-input power supply from a Cisco 12008 router equipped with a single such unit. In this case, you must power down the router before removing the power supply.

It is also assumed that the power supply to be removed is installed in the lower power supply bay, which, by convention, is the normal configuration for a single power supply.

Lastly, in such a single power supply configuration, it is assumed that the vacant upper power supply bay has previously been covered by a blank filler panel to ensure EMI compliance and the proper flow of cooling air through the router. However, if such is not the case, it is recommended that you either install a second (redundant) power supply in the vacant bay or cover it with a blank filler panel.

To remove the AC-input power supply from the router, perform the following steps:

- Step 1** On the power supply to be replaced, set the rotary power switch to the standby (OFF) position.

Note Turning the power supply switch counterclockwise to the standby (OFF) position releases the mechanical interlock (latching mechanism) that secures the power supply within in the bay.

- Step 2** Locate and turn off the source AC circuit breaker that is currently servicing the AC-input power supply.

- Step 3** Tape the circuit breaker handle in the OFF position as an additional safety precaution.
- Step 4** Using a 1/4-inch flat-blade screwdriver, loosen the captive installation screw on the power supply faceplate.
- Step 5** Release the bail latch that secures the source AC power cord to the AC receptacle on the power supply faceplate.
- Step 6** Remove the power cord from the AC receptacle.
- Step 7** Grasp the power supply carrying handle with one hand and pull the unit halfway out of the bay to disengage the blind-mating connector at the back of the power supply from the backplane.



Warning The AC-input power supply weighs 17 lb (7.73 kg). For safety, use both hands to withdraw the unit from the bay.

- Step 8** Place your free hand beneath the power supply to support its weight; withdraw the unit completely from the bay.
- Step 9** Pending further action, set the unit aside in a safe place.

If you intend to return the removed power supply to the factory for repair or replacement, repackage the unit properly for return shipment using the original packing materials, if available.
- Step 10** On the new AC-input power supply that you intend to insert into the now vacant power supply bay, set the rotary power switch on the power supply faceplate to the standby (OFF) position.
- Step 11** Grasp the carrying handle on the power supply with one hand; place your free hand beneath the unit to support its weight.
- Step 12** Position the unit appropriately for insertion into the vacant power supply bay.
- Step 13** Gently slide the new power supply into the bay, carefully seating it so that the power supply faceplate is flush against the sheet metal of the power supply bay. Doing so ensures that the blind-mating connector at the rear of the power supply is firmly seated in the backplane connector.



Caution To prevent damage to the blind-mating connectors, do not use excessive speed or force when inserting the new power supply into the bay.

Note All the necessary electrical connections between the power supply and the backplane are accomplished automatically by means of the blind-mating connectors.

- Step 14** Using a 1/4-inch flat-blade screwdriver, tighten the captive installation screw on the power supply faceplate.
- Step 15** Connect the source AC power cord to the AC receptacle on the power supply faceplate.
- Step 16** Secure the bail latch over the source AC power cord to retain it in the AC receptacle.
- Step 17** Set the rotary power switch on the new AC-input power supply to the ON (I) position.

To verify that the new power supply is operating properly, perform the procedure in the following section.

Verifying the Installation of a Power Supply

To verify the operation of a newly-installed AC-input power supply, you first apply power to the unit and then observe the status of the LEDs on the power supply faceplate.

To verify the operation of a newly-installed AC-input power supply, perform the following steps:

Step 1 First, verify that the following conditions have been satisfied:

- The power supply is completely inserted into the bay and secured in place with its captive installation screw.
- A vacant power supply bay is covered with a blank filler panel to ensure EMI compliance and the proper flow of cooling air through the router enclosure.
- The source AC power cable is properly connected to the AC receptacle on the power supply faceplate.
- The source end of the AC power cable is properly connected to the main source AC circuit breaker.
- The main source AC circuit breaker servicing the AC-input power supply is ON.
- The source AC voltage is within the range specified on the power supply faceplate.
- When two AC-input power supplies are installed, each power cord is connected to a separate AC power source.

Each AC power source must be on a dedicated circuit rated at 20A (for North America) or 10A or 16A (for the International area).

Step 2 Set the rotary power switch on the newly-installed power supply to the ON position.

Step 3 Observe the behavior of the green AC INPUT OK LED on the power supply faceplate for the following conditions:

- The AC INPUT OK LED illuminates if the source AC voltage is within the proper operating range (see the label on the power supply faceplate).
- If the green AC INPUT OK LED fails to illuminate, determine if
 - (a) The source AC circuit breaker is on.
 - (b) The source AC power cord is securely connected from the source AC circuit breaker to the AC receptacle on the power supply faceplate.
- If the AC INPUT OK LED illuminates as expected, proceed to Step 4.
- If the AC INPUT OK LED fails to illuminate after power is applied to the unit, contact a Cisco service representative for assistance.

Step 4 Observe the behavior of the red OUTPUT FAIL LED on the power supply faceplate after applying power to the unit. This LED should flash on momentarily, then go off and remain so.

- If the OUTPUT FAIL LED behaves as expected, proceed with normal system operations.

- If the OUTPUT FAIL LED remains on when the new power supply is installed and powered up, the power supply may be faulty, or an adverse environmental condition may exist in the router, such as an overvoltage or overtemperature condition that causes the power supply to shut down.
- If two AC-input power supplies are installed and the OUTPUT FAIL LED illuminates on only one power supply, the associated power supply itself may be faulty, or source power for that unit may be faulty.
- If the OUTPUT FAIL LEDs on both power supplies go on, each of which is connected to a separate DC power source, you can assume that an overvoltage or overtemperature condition in the router is causing both power supplies to fail. Also, the OUTPUT FAIL LEDs could be on due to a defective MBus controller or an old version of MBus code.

If the new AC-input power supply fails to operate properly after several attempts to power it up as described above, contact your Cisco service representative for assistance.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

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CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

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- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

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