Installing Electrical Interface Assemblies in the Cisco ONS 15454

Product Numbers: 15454-EIA-BNC-A24=, 15454-EIA-BNC-B24=, 15454-EIA-BNC-A48=, 15454-EIA-BNC-B48=, 15454-EIA-SMB-A84=, 15454-EIA-SMB-B84=, 15454-EIA-AMP-A84=, 15454-EIA-AMP-B84=, 15454-EIA-1BNCA24=, 15454-EIA-1BNCB24=, 15454-EIA-1BNCA48=, 15454-EIA-1BNCB48=, 15454-EIA-1SMBA84=, 15454-EIA-1SMBB84=, 15454-EIA-1AMPA84=, 15454-EIA-1AMPB84=

This document describes how to install Electrical Interface Assemblies (EIAs) for the Cisco ONS 15454. EIAs are pre-installed on the ONS 15454 when ordered with the system. EIAs host a special card that provides coaxial cable connection points (SMB or BNC) for the DS-3 or EC-1 cards. EIAs also host twisted pair wire-wrap adapters for SMB connectors or, for the DS-1 card, AMP Champ connectors. EIAs have a special backplane cover with cutouts over the cable connectors.

Use this document in conjunction with the *Cisco ONS 15454 Procedure Guide* and the *Cisco ONS 15454 Reference Manual* when working with EIAs or any other system components.

This document contains the following sections:

EIA Naming and Shelf Assembly Compatibility

The procedures in this document refer to A-side and B-side EIAs. As you face the rear of the ONS 15454 shelf assembly, the right-hand side is considered the A side and the left-hand side is the B side. Table 1 shows the EIA types supported by both the 15454-SA-ANSI and the 15454-SA-HD shelf assemblies.

Table 1   EIA Configurations Compatible with the 15454-SA-ANSI and the 15454-SA-HD

EIA Type	Cards Supported	A-side Hosts	A-side Columns Map to	A-side Product Number	B-side Hosts	B-side Columns Map to	B-side Product Number
BNC	DS-3 DS3XM-6 EC-1	24 pairs of BNC connectors	Slot 2 Slot 4	**15454-EIA-1BNCA24=**	24 pairs of BNC connectors	Slot 14 Slot 16	**15454-EIA-1BNCB24=**
High-Density BNC	DS-3 DS3XM-6 EC-1	48 pairs of BNC connectors	Slot 1 Slot 2 Slot 4 Slot 5	**15454-EIA-1BNCA48=**	48 pairs of BNC connectors	Slot 13 Slot 14 Slot 16 Slot 17	**15454-EIA-1BNCB48=**
SMB	DS-1 DS-3 EC-1 DS3XM-6	84 pairs of SMB connectors	Slot 1 Slot 2 Slot 3 Slot 4 Slot 5 Slot 6	**15454-EIA-1SMBA84=**	84 pairs of SMB connectors	Slot 12 Slot 13 Slot 14 Slot 15 Slot 16 Slot 17	**15454-EIA-1SMBB84=**
AMP Champ	DS-1	6 AMP Champ connectors	Slot 1 Slot 2 Slot 3 Slot 4 Slot 5 Slot 6	**15454-EIA-1AMPA84=**	6 AMP Champ connectors	Slot 12 Slot 13 Slot 14 Slot 15 Slot 16 Slot 17	**15454-EIA-1AMPB84=**
UBIC[1]	DS-1 DS-3 DS3X EC-1 E-1	16 UBIC connectors	Slot 1 Slot 2 Slot 3 Slot 4	**15454-EIA-UBICH-A=**	16 UBIC connectors	Slot 14 Slot 15 Slot 16 Slot 17	**15454-EIA-UBICH-B=**

1. The UBIC EIA Type is compatible only with 15454-SA-HD.

ONS 15454 Backplane Description

Before installing EIAs, familiarize yourself with the rear of the ONS 15454. Figure 1 shows the location of the lower backplane cover and the backplane sheet metal covers. The sheet metal covers and EIAs attach to the shelf assembly using nine perimeter screws. Five screws hold the lower backplane cover in place.

Figure 1   ONS 15454 Rear View (with Sheet Metal Covers Attached)
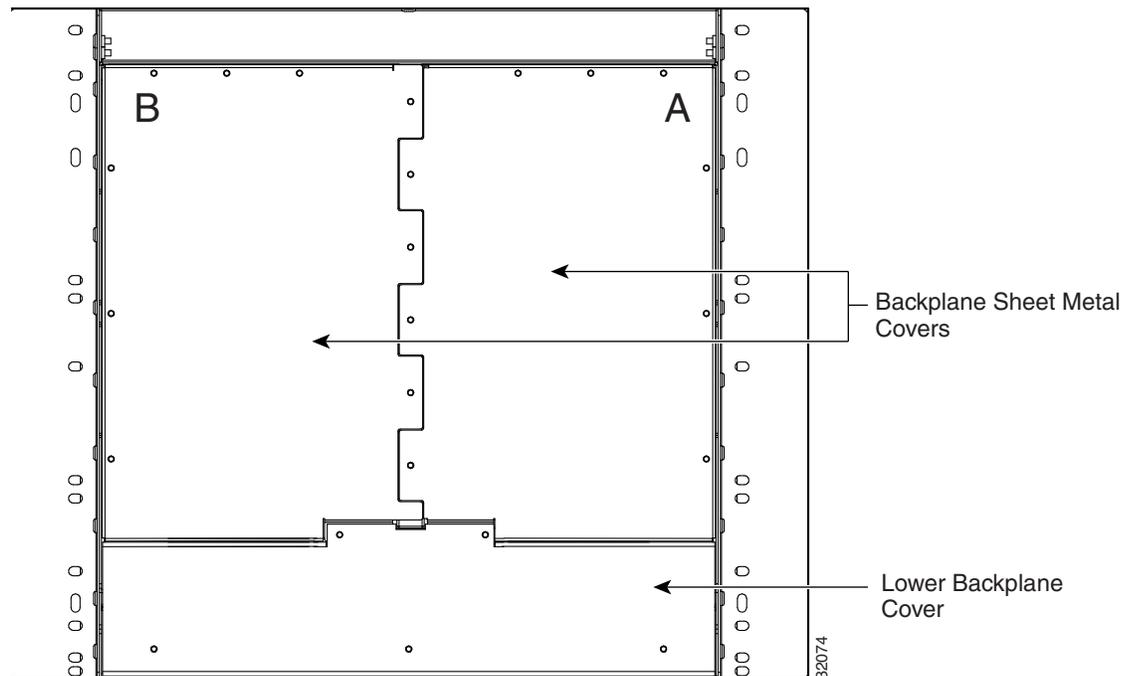

Prepare the Backplane for EIA Installation

Before installing the EIA(s), you must prepare the backplane for installation. If an EIA has not been installed, you need to remove the backplane covers to expose the EIA backplane-mating connectors.

Step 1   To remove the lower backplane cover, loosen the five screws that secure it to the ONS 15454 and pull it away from the shelf assembly.

Step 2   Loosen the nine perimeter screws that hold the backplane sheet metal cover(s) in place.

Step 3   Lift the panel by the bottom to remove it from the shelf assembly.

Step 4   Store the panel for later use.

Attach the backplane sheet metal cover(s) whenever EIA(s) are not installed. Figure 2 shows how to remove a sheet metal cover.

Figure 2   Removing a sheet metal cover
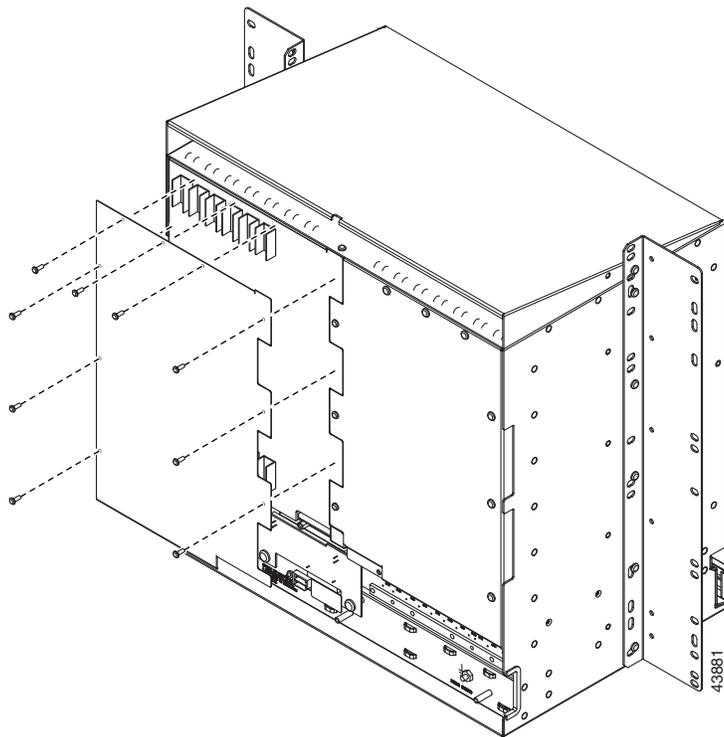
Installing EIAs

Except for an additional step required to install the AMP Champ EIA, the installation procedure is identical for all the EIA types. To install an EIA, you remove the lower backplane cover, remove the backplane sheet metal covers, plug the EIA card into the mating connectors, attach the EIA cover panel, and secure the EIA to the ONS 15454 using nine perimeter screws. To install the AMP Champ EIA, you must also attach the fastening plate at the bottom of the connector row. This section describes the installation procedures for each EIA.

You will need a calibrated torque driver set to 9 in-lbs to perform the installation procedures.

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Caution   Always use an electrostatic discharge (ESD) wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

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Note   You can install EIAs on one or both sides of the ONS 15454 backplane in any combination (for example, AMP Champ on the A side and BNC on the B side, or High-Density BNC on the A side and SMB on the B side).

> **Note** EIAs are hot-swappable. You do not need to disconnect the power to install or remove EIAs.

Inspect the EIA Cards

Before installing an EIA card, you must inspect the EIA card to determine that the connectors are not rotated from their original position. A card with rotated connectors can be installed, but may cause problems during turn up. If you must use more than normal pressure to seat the card, you should inspect it for rotated connectors.

> **Note** An installed EIA card with rotated connectors may operate properly; however, once an electrical connection exists it is possible but unlikely that the connection could fail. If you are unable to pass data over any port, inspect the EIA card for rotated connectors.

Step 1 Turn the EIA card so that the connectors face you. You should see two rows of six connectors. One row is across the top of the card, and the other row is across the bottom of the card.

Step 2 Ensure that all connectors are positioned with the large index pin facing the edge of the assembly that is closest to the center of the shelf when installed. The small index pin should face the outside edge of the assembly. Figure 3 shows an example of correct and incorrect connector position on the A-side EIA card. Figure 4 shows an example of correct and incorrect connector position on the B-side EIA card.

If the connectors are rotated, contact the Cisco Technical Assistance Center (TAC) at 1-877-323-7368 to open a Return Material Authorization and Fault Symptom Report (RMA).

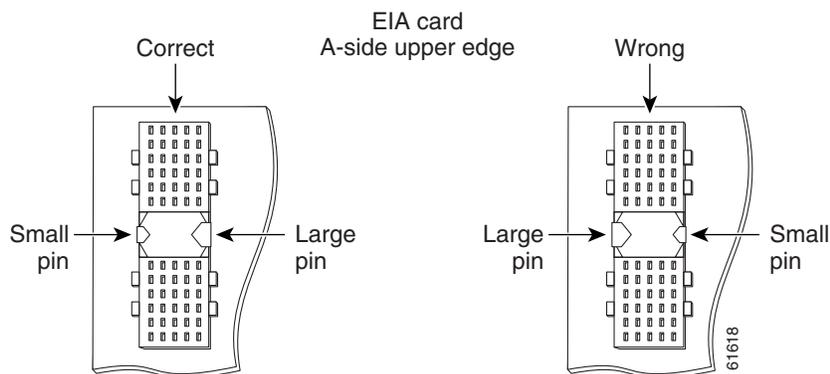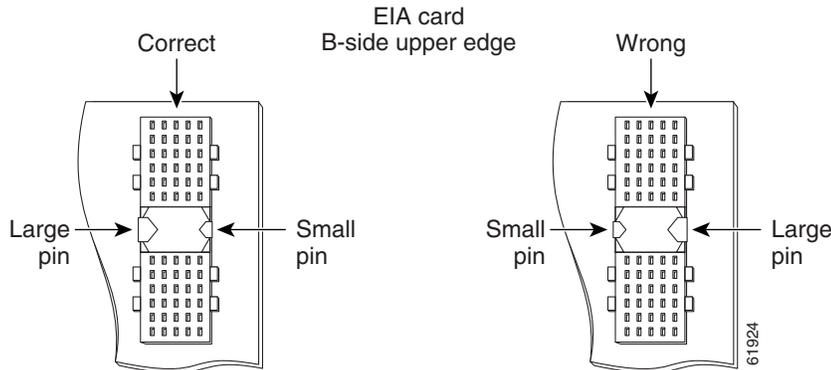*Figure 3   A-Side Correct and Incorrect Connector Position*

Figure 4 **B-Side Correct and Incorrect Connector Position**

Install the BNC EIA

The BNC backplane is designed for use with DS-3 (including DS3XM-6) and EC-1 cards. The EIA A side hosts 24 pairs of BNC connectors. The first 12 pairs of BNC connectors map to Slot 2 on the shelf assembly and correspond to Ports 1 through 12 of a 12-port card. The second 12 BNC connector pairs map to Slot 4 on the shelf assembly and correspond to Ports 1 through 12 of a 12 port card.

The EIA B side provides an additional 24 pairs of BNC connectors. The first 12 BNC connector pairs correspond to Ports 1 through 12 of a 12-port card and map to Slot 14 on the shelf assembly. The second 12 BNC connector pairs correspond to Ports 1 through 12 of a 12-port card and map to Slot 16 on the shelf assembly. The BNC connector pairs are marked "Tx" and "Rx" to indicate the transmit and receive cables for each port.

Install the BNC EIA(s) after removing the backplane sheet metal covers or existing EIA(s). See the "Removing EIAs" section on page 11 if applicable.

Step 1 To remove the lower backplane cover, loosen the five screws that secure it to the ONS 15454 and pull it away from the shelf assembly.

Step 2 Remove the BNC card from the packaging. Line up the connectors on the BNC card with the mating connectors on the backplane. Gently push the BNC card until both sets of connectors fit together snugly.

Step 3 Place the metal BNC cover panel over the BNC card.

Step 4 Insert and tighten the nine perimeter screws (P/N 48-0358) at 8-10 lbs to secure the cover panel to the backplane.

Step 5 Insert and tighten the twelve inner screws (P/N 48-0004) at 8-10 lbs to secure the cover panel to the BNC card and backplane.

Step 6 Replace the lower backplane cover, and insert and tighten the five screws to secure it.

For more information about the BNC EIA, refer to the *Cisco ONS 15454 Reference Manual.*

Figure 5 shows BNC EIA installation.

Figure 5   Installing the BNC EIA
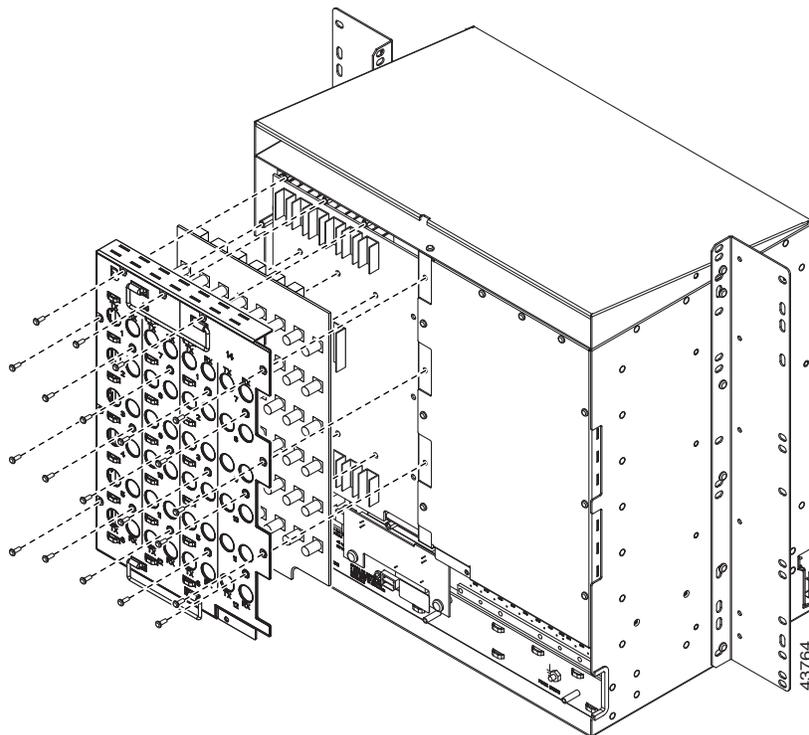
Install the High-Density BNC EIA

The High-Density BNC backplane is designed for use with DS-3 (including DS3XM-6) and EC-1 cards. The EIA A side hosts 48 pairs of BNC connectors. Each column of connector pairs is numbered and corresponds to the slot of the same number. The first column (12 pairs) of BNC connectors corresponds to Slot 1 on the shelf assembly, the second column to Slot 2, the third column to Slot 4 and the fourth column to Slot 5. The rows of connectors correspond to Ports 1 through 12 of a 12-port card.

The EIA B side provides an additional 48 pairs of BNC connectors. The first column (12 pairs) of BNC connectors corresponds to Slot 13 on the shelf assembly, the second column to Slot 14, the third column to Slot 16 and the fourth column to Slot 17. The rows of connectors correspond to Ports 1 through 12 of a 12-port card. The BNC connector pairs are marked "Tx" and "Rx" to indicate transmit and receive cables for each port.

Install the BNC EIA(s) after either removing the backplane sheet metal covers or existing EIA(s). See the if applicable.

Step 1 To remove the lower backplane cover, loosen the five screws that secure it to the ONS 15454 and pull it away from the shelf assembly.

Step 2 Remove the High-Density BNC card from the packaging. Line up the connectors on the card with the mating connectors on the backplane. Gently push the card until both sets of connectors fit together snugly.

Step 3 Place the metal High-Density BNC cover panel over the card.

Step 4 Insert and tighten the nine perimeter screws (P/N 48-0358) at 8-10 lbs to secure the cover panel to the backplane.

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Step 5 Insert and tighten the nine inner screws (P/N 48-0004) at 8-10 lbs to secure the cover panel to the High-Density BNC card and backplane.

Step 6 Replace the lower backplane cover, and insert and tighten the five screws to secure it.

For information about connecting to the High-Density BNC EIA, refer to the *Cisco ONS Procedure Guide*.

Figure 6 shows High-Density BNC EIA installation.

Figure 6   Installing the High-Density BNC EIA
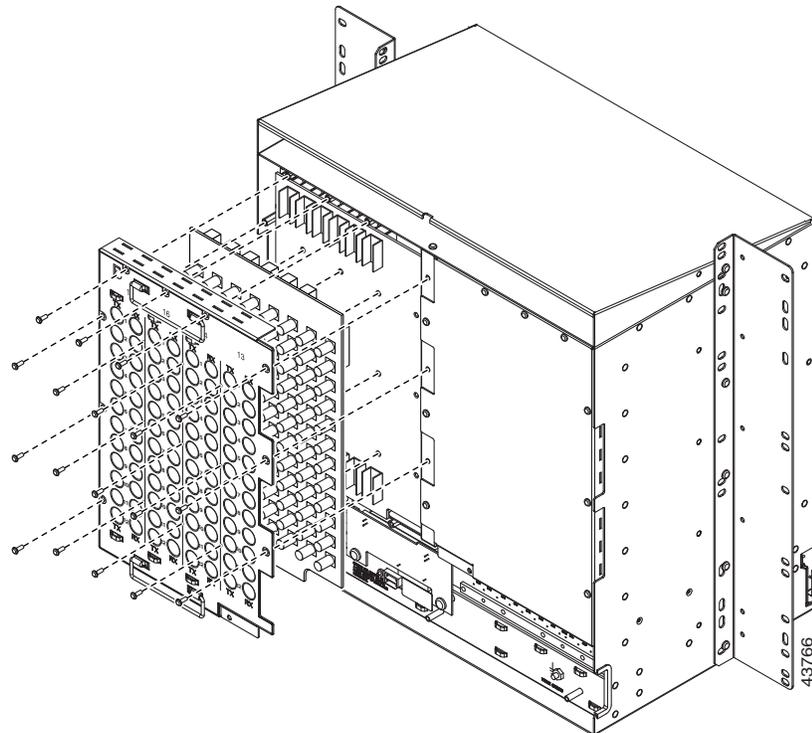
Install the SMB EIA

The SMB backplane is designed for use with DS-1, DS-3 (including DS3XM-6), or EC-1 cards. The EIA A side hosts 84 SMB connectors in six columns of 14 connectors. The A side columns are numbered 1 – 6 and correspond to Slots 1 – 6 on the shelf assembly. The EIA B side hosts an additional 84 SMB connectors in six columns of 14 connectors. The B side columns are numbered 12 – 17 and correspond to slots 12 – 17 on the shelf assembly. The connector rows are numbered 1 – 14 and correspond to the 14 ports on a DS-1 card. If you use a DS-3 or EC-1 card, only Ports 1 – 12 are active. If you use a DS3XM-6 card, only Ports 1 – 6 are active. The SMB connector pairs are marked "Tx" and "Rx" to indicate the transmit and receive cables for each port. If you use SMB connectors, you can install DS-1, DS-3, or EC-1 cards in any general purpose slot.

If you are replacing or changing EIA(s), you must first remove the existing EIA. See the "Removing EIAs" section on page 11.

Step 1 Remove the SMB card from the packaging. Line up the connectors on the card with the mating connectors on the backplane. Gently push the card until both sets of connectors fit together snugly.

Step 2 Place the foil EMI gasket over the SMB card so that the holes in the foil EMI gasket line up with the SMB connectors.

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Caution The foil EMI gasket might ship already installed on the SMB EIA. If it is not, you must install it to meet electromagnetic interference (EMI) guidelines.

Step 3 Place the metal SMB cover panel over the card.

Step 4 Insert and tighten the twelve inner screws (P/N 48-0004) at 8 to 10 lb (3.6 to 4.5 kg) to secure the cover panel to the card and backplane.

Step 5 Insert and tighten the nine perimeter screws (P/N 48-0358) at 8 to 10 lb (3.6 to 4.5 kg) to secure the cover panel to the backplane.

Step 6 Replace the lower backplane cover, and insert and tighten the five screws to secure it.

If you are using SMB EIAs to make DS-1 connections, you need the DS-1 electrical interface adapter, commonly referred to as a balun (P/N 15454-WW-14=).

For information about connecting to the SMB EIA, refer to the *Cisco ONS 15454 Procedure Guide*.

Figure 7 shows an SMB EIA installation.

Figure 7   Installing the SMB EIA
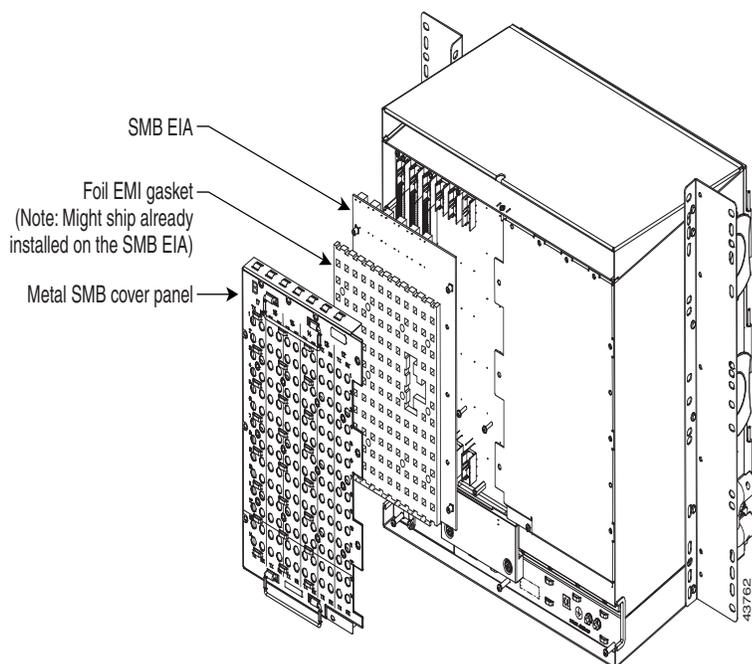
Install the AMP Champ EIA

The EIA A side hosts six AMP Champ connectors, one for each service card slot on that side of the backplane. The connectors are labeled 1 – 6 and correspond to Slots 1 – 6 on the shelf assembly. The EIA B side hosts six AMP Champ connectors, one for each service card slot on that side of the backplane. The connectors are labeled 12 – 17 and correspond to Slots 12 – 17 on the shelf assembly. Each AMP Champ connector on the backplane supports 14 DS-1 ports for a DS1-14 card, and each connector has 28 live pairs—one transmit pair and one receive pair—for each DS-1 port.

If you are replacing or changing EIA(s), you must first remove the existing EIA. See the "Removing EIAs" section on page 11.

Step 1 To remove the lower backplane cover, loosen the five screws that secure it to the ONS 15454 and pull it away from the shelf assembly.

Step 2 Align the AMP Champ cover panel with the backplane and insert and tighten the nine perimeter screws (P/N 48-0358) at 8-10 lbs.

Step 3 Align an AMP Champ connector with the backplane connector and push until it fits snugly. Repeat until you have installed all six AMP cards.

Step 4 To secure each AMP Champ connector to the cover panel, insert and tighten a screw (P/N 48-0003) at the top of each card at 8-10 lbs.

Step 5 Place the AMP Champ fastening plate along the bottom of the cover panel, and hand tighten the two thumbscrews.

For more information about AMP Champ EIA(s), refer to the *Cisco ONS 15454 Procedure Guide*.

Figure 8 shows AMP Champ EIA installation.

Figure 8   *Installing the AMP Champ EIA*
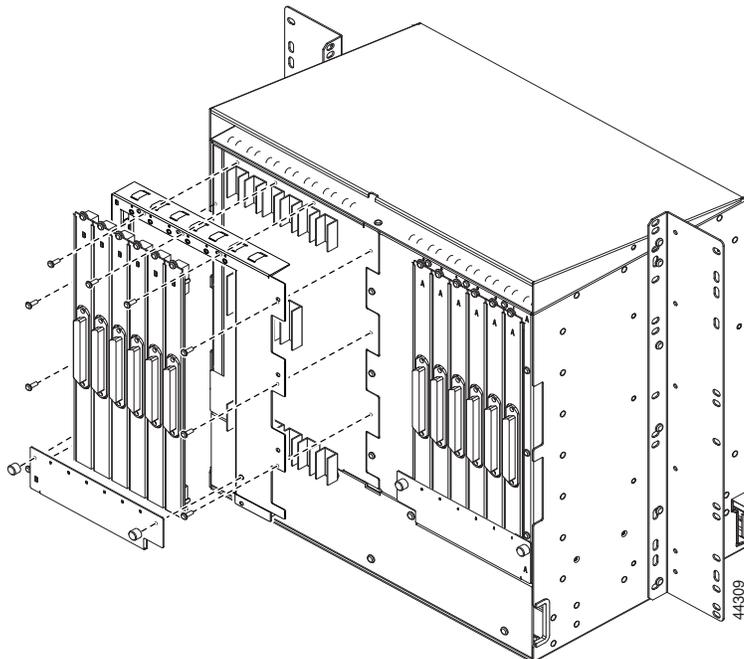
Verify the Electrical Connection

After installing the EIAs you should verify that the ports are making an electrical connection. Cisco recommends that you use a DS-1 card to test all fourteen ports. As an alternative, you can use a DS-3 card to test the first twelve ports.

Step 1 Install the DS-1 card in the slot you want to test.

Step 2 Place the port in service:

    a. Click the **Provisioning** tab in CTC.

    b. Choose **In Service** from the Status pull-down menu.

    c. Click **Apply**.

Step 3 Confirm that an LOS alarm is received for the specific port.

Step 4 Loop the transmit connector to the receive connector.

Step 5 Confirm that the LOS alarm is cleared, and that an AIS alarm is indicated for the port.

Step 6 Return the port to its pretest condition.

Step 7 Repeat as desired for any other ports and/or slots.

Removing EIAs

Step 1 To remove the lower backplane cover, loosen the five screws that secure it to the ONS 15454 and pull it away from the shelf assembly.

Step 2 Loosen the nine perimeter screws that hold the EIA in place.

If you are removing an AMP Champ EIA, remove the fastening plate before proceeding. To remove the fastening plate, loosen the two thumbscrews.

Step 3 Lift the EIA handles and gently pull the EIA panel away from the backplane.

This document is to be used in conjunction with the *Cisco ONS 15454 Procedure Guide*.