

Preparing to Install the Cisco NCS 2002, NCS 2006, and NCS 2015 Shelf

This chapter explains how to prepare for the Cisco NCS 2002, NCS 2006, and NCS 2015 shelf install.

The sections are:

- Important Safety Recommendations, on page 1
- Required Tools and Equipment, on page 3
- Ordering Solutions for NCS 2002, NCS 2006, and NCS 2015, on page 8
- Card Slot Requirements, on page 8
- NTP-L41 Unpacking and Inspecting the Shelf, on page 11

Important Safety Recommendations

Warning **This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the Regulatory Compliance and Safety Information document for the appropriate Cisco chassis.** Statement 274

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Warning **This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.** Statement 1043



Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017



Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040



Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 1022



Caution **This equipment is suitable for installations utilizing the insert Common Bonding Network (CBN).** Equipment Bonding Networks CBN—Statement 7013



Note These routers are designed to boot up in less than 30 minutes, provided the neighboring devices are in full operational state.



Note The NCS 2002, NCS 2006, and NCS 2015 are suitable for mounting on concrete or other noncombustible surfaces only.



Note In this chapter, “shelf” refers to the steel enclosure that holds cards and connects power, and “node” refers to the entire hardware and software system. Unless otherwise specified, NCS 2002, NCS 2006, and NCS 2015 refers to both ANSI and ETSI environments.



Note The NCS 2006 is suitable for installation in network telecommunication facilities where the National Electric Code (NEC) applies.

Required Tools and Equipment

The following sections describe the tools and equipment you need to install and test the NCS 2002, NCS 2006, or NCS 2015 shelves.

Cisco Supplied Materials

The following table lists the materials that are required to install, and are shipped with the NCS 2002, NCS 2006, and NCS 2015 shelves (wrapped in plastic). The shipped quantity of each item is in parentheses.

Note To avoid damage during shipment, either a standard front door or a temporary front door is preinstalled in the Cisco NCS 2006 shelves. If a front door is ordered, a standard front door is preinstalled. If a front door is not ordered, a temporary front door is preinstalled.

Table 1: Cisco Supplied Materials Required to Install

Cisco Supplied Material	NCS 2002	NCS 2006	NCS 2015
Brackets	**ANSI**RJ LAN bracket (1)	**ANSI**RJ LAN bracket (1)	—
Bracket Cover	**ANSI** RJ LAN cable bracket cover (1)	**ANSI** RJ LAN cable bracket cover (1)	—
Bumpers	Rubber bumpers (4)		—
Cables	Cable assembly, Ethernet, RJ-45 (1)	Cable assembly, Ethernet, RJ-45 (1)	—
Emery Cloth	Emery cloth (1)	Emery cloth (1)	Emery cloth (1)
ESD wrist strap	ESD wrist strap (disposable) (1)	ESD wrist strap (disposable) (1)	ESD wrist strap (disposable) (1)

Cisco Supplied Material	NCS 2002	NCS 2006	NCS 2015
Grounding Lug	• Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm² (#6 AWG) multistrand copper wire (1). • Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm² (#6 AWG) multistrand copper wire angled at 45 degree (1)	• Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm² (#6 AWG) multistrand copper wire (1) • Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 13.3 mm² (#6 AWG) multistrand copper wire angled at 45 degree (1)	Double-hole grounding lug for ground connection with a wire receptacle to accommodate the recommended 21.2 mm² (#4 AWG) multistrand copper wire (1)
Lacing Twine	Lacing twine (1)	Lacing twine (1)	—
Lock Washers	M6 lock washers (8)	**ANSI** M6 lock washers (8)	—
Mounting Brackets	Reversible ANSI 19"/23" bracket and ETSI bracket	Reversible ANSI 19"/23" bracket and ETSI bracket	ANSI 19" bracket (EIA), ANSI 23" bracket (EIA), ANSI 23” Z bracket (EIA), and ETSI bracket
Power Lug	**ANSI** Double-hole power lug for DC power connection with a wire receptacle to accommodate the recommended 8.4 mm² (#8 AWG) multistrand copper wire (1)	—	Double-hole power lug for DC power connection with a wire receptacle to accommodate the recommended 13.29 mm² (#6 AWG) multistrand copper wire. Based on the door that is installed, use either short barrel lugs or long barrel lugs: • Standard door—Use short barrel lug (16) • Deep door—Use long barrel lug (16)
Mounting bracket screws	**ANSI**#12-24 x 0.50 pan-head Phillips screws (8) **ETSI** M6.0 x 20 pan-head Phillips screws (8)	**ANSI** #12-24 x 0.50 pan-head Phillips screws (8) **ETSI** M6.0 x 20 pan-head Phillips screws (8)	**ANSI** M4.0 x 6mm flat-head Phillips screws (10) **ETSI** M4.0 x 6 flat-head Phillips screws (10)
Deep door bracket screws and washer	—	—	• M3 x 10 mm screws (10) • M3 x 8 mm screw (1) and safety washer (1)

Cisco Supplied Material	NCS 2002	NCS 2006	NCS 2015
Screws and lock washers for grounding the chassis	—	—	• M6.0 x 16mm pan-head Phillips screws (2) • M6 lock washers (2)
Tie Wraps	Tie wraps (10)	Tie wraps (10)	Tie wraps (10)
Mounting screws and washers	—	—	• **ANSI** #12-24 x 0.50 inch pan-head Phillips mounting screws (16) • **ETSI** M6 x 20 mm pan-head Phillips mounting screws (16) • Washers (16)
Screw for ground strap cable	—	—	M3 x 6 mm screw (1)
Anti-oxidant	—	—	Anti-oxidant (1)

Caution Only use the power cables that are designed to be used with the NCS 2002, NCS 2006, or NCS 2015. These are sold separately.

User Supplied Materials

The following materials, tools, and equipment are required but are not supplied with the NCS 2002, NCS 2006, and NCS 2015.

Table 2: User Supplied Materials

User Supplied Material	NCS 2002	NCS 2006	NCS 2015
Bit error rate (BER) tester	—	—	—
BNC insertion tool	—	—	—
Chassis grounding, connecting power	1/4" socket wrench, sockets, and a torque wrench	1/4" socket wrench, sockets, and a torque wrench	1/4" socket wrench, sockets, and a torque wrench

User Supplied Material	NCS 2002	NCS 2006	NCS 2015
Cables	ANSI • Power cable (from fuse and alarm panel to assembly), #12 AWG or larger, copper conductors, 194 degrees Fahrenheit (90 degrees Celsius). • Ground cable #6 AWG stranded • Alarm cable pairs for all alarm connections, #22 or #24 AWG (0.51 mm² or 0.64 mm²), solid tinned. • 100-ohm shielded building integrated timing supply (BITS) clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type ETSI • Copper ground cable 13.3-mm² (#6 AWG) stranded, specified for up to 90 degrees Celsius (194 degrees Fahrenheit) • Alarm cable pairs for all alarm connections, 0.51 mm² or 0.64 mm² (#22 or #24 AWG), solid-tinned	ANSI • Power cable (from fuse and alarm panel to assembly), #8 AWG or larger, copper conductors, 194 degrees Fahrenheit (90 degrees Celsius). • Ground cable #6 AWG stranded • Alarm cable pairs for all alarm connections, #22 or #24 AWG (0.51 mm² or 0.64 mm²), solid tinned. • 100-ohm shielded building integrated timing supply (BITS) clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type ETSI • Copper ground cable 13.3-mm² (#6 AWG) stranded, specified for up to 90 degrees Celsius (194 degrees Fahrenheit) • Alarm cable pairs for all alarm connections, 0.51 mm² or 0.64 mm² (#22 or #24 AWG), solid-tinned	• Power cable (from fuse and alarm panel to assembly), #6 AWG, copper conductors, 194 degrees Fahrenheit (90 degrees Celsius). • Ground cable #4 AWG stranded • Alarm cable pairs for all alarm connections, #22 or #24 AWG (0.51 mm² or 0.64 mm²), solid tinned. ANSI • 100-ohm shielded building integrated timing supply (BITS) clock cable pair #22 or #24 AWG (0.51 mm² or 0.64 mm²), twisted-pair T1-type ETSI • 75-ohm coaxial cable with a DIN-1.0/2.3 miniature coaxial connector.
Cleaning Cassette	CLETOP cleaning cassette	CLETOP cleaning cassette	CLETOP cleaning cassette
Crimp tool	Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug. Use the lug manufacturer's suggested dye for crimping.	Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug. Use the lug manufacturer's suggested dye for crimping.	Crimping tool—This tool must be large enough to accommodate the girth of the grounding lug when you crimp the grounding cable into the lug. Use the lug manufacturer's suggested dye for crimping.
Fuse and Alarm panel	ANSI Fuse and alarm panel ETSI Fuse and alarm panel	ANSI Fuse and alarm panel ETSI Fuse and alarm panel	ANSI Fuse and alarm panel ETSI Fuse and alarm panel
Jumper	Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical (OC-N) cards	Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical (OC-N) cards	Single-mode SC fiber jumpers with UPC polish (55 dB or better) for optical (OC-N) cards

User Supplied Material	NCS 2002	NCS 2006	NCS 2015
Labels	Labels	Labels	Labels
Power Meter	Optical power meter (for use with fiber optics only)	Optical power meter (for use with fiber optics only)	Optical power meter (for use with fiber optics only)
Rack	ANSI • 19-inch ANSI Standard (Telcordia GR-63-CORE) (482.6 mm) rack; total width 22 inches (558.8 mm) • 23-inch ANSI Standard (Telcordia GR-63-CORE) (584.2 mm) rack; total width 26 inches (660.4 mm) ETSI Equipment rack (ETSI rack, 2200 mm [86.6 inch] H x 600 mm [23.6 inch] Wx 300 mm [11.8 inch] D)	ANSI • 19-inch ANSI Standard (Telcordia GR-63-CORE) (482.6 mm) rack; total width 22 inches (558.8 mm) • 23-inch ANSI Standard (Telcordia GR-63-CORE) (584.2 mm) rack; total width 26 inches (660.4 mm) ETSI Equipment rack (ETSI rack, 2200 mm [86.6 inch] H x 600 mm [23.6 inch] Wx 300 mm [11.8 inch] D)	ANSI • 19-inch ANSI Standard (Telcordia GR-63-CORE) (482.6 mm) rack; total width 22 inches (558.8 mm) • 23-inch ANSI Standard (Telcordia GR-63-CORE) (584.2 mm) rack; total width 26 inches (660.4 mm) ETSI Equipment rack (ETSI rack, 2200 mm [86.6 inch] H x 600 mm [23.6 inch] Wx 300 mm [11.8 inch] D)
Screw Driver	• #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screw driver	• #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screw driver	• #2 Phillips Dynamometric screwdriver • Medium slot-head screwdriver • Small slot-head screw driver
Tie wraps and/or lacing cord	Tie wraps or lacing cord (or both)	Tie wraps or lacing cord (or both)	Tie wraps or lacing cord (or both)
Video fiber connector inspection instrument	Video fiber connector inspection instrument	Video fiber connector inspection instrument	Video fiber connector inspection instrument
Voltmeter	Voltmeter	Voltmeter	Voltmeter
Wire Cutters	Wire cutters	Wire cutters	Wire cutters
Wire Strippers	Wire strippers	Wire strippers	Wire strippers
Wire Wrapper	Wire wrapper	Wire wrapper	Wire wrapper

Note Ring runs are not provided by Cisco and can hinder side-by-side shelf installation where space is limited.

Ordering Solutions for NCS 2002, NCS 2006, and NCS 2015

Two ordering solutions for the NCS 2002 shelf are offered. Select one of these solutions:

- Shelf that is preinstalled with all the ancillary units such as fan tray assembly and power module.
- Shelf that is not preinstalled with the ancillary units but can be ordered separately.

Note In both the ordering solutions, the front door is preinstalled with the NCS 2002 shelf.

Two ordering solutions for the Cisco NCS 2006 shelf are offered. Select one of these solutions:

- Shelf assembly that is preinstalled with all the ancillary units such as fan tray assembly, LCD unit, power module and NCS 2006 ECU.
- Shelf assembly that is not preinstalled with the ancillary units but can be ordered separately.

One ordering solution for the Cisco NCS 2015 shelf is offered.

- Shelf assembly that is not preinstalled with the ancillary units but can be ordered separately.

Card Slot Requirements

The cards have electrical plugs at the back that plug into electrical connectors on the shelf backplane. When the ejectors are fully closed, the card plugs into the assembly backplane.

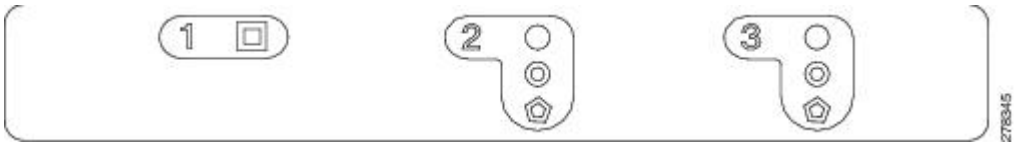
NCS 2002

The NCS 2002 shelf assemblies have 3 card slots numbered sequentially from bottom to top. Slot 1 is reserved for control cards (TNC, TNCE, TSC, or TSCE). Slot 2 and Slot 3 are dedicated for common line cards.

Caution The NCS 2002 shelf must be equipped with a TNC, TNCE, TSC, or TSCE card.

Shelf slots have symbols indicating the type of cards that you can install in them. Each NCS 2002 card has a corresponding symbol. The symbol on the card must match the symbol on the slot.

Figure 1: Slot Symbols



The following table shows the slot and card symbol definitions.

Table 3: Slot and Card Symbols

Symbol Color/Shape	Definition
Purple/Square	Slot 1. TNC/TNCE/TSC/TSCE card slot. Only install the card with a square symbol on the faceplate.
Orange/Circle	Slots 2 and 3. Only install cards with a circle symbol on the faceplate.
Orange/Hollow Circle	Slots 2 to 3. New line cards with high speed back plane connectors.
Pink/Pentagon	Slots 2 and 3. New Uplink card.

NCS 2006

The NCS 2006 shelf assemblies have eight card slots numbered sequentially from bottom to top. Slots 1 and 8 are reserved for control cards (TNC, TNCE, TSC, or TSCE). Slots 2, 3, 4, 5, 6, and 7 are dedicated for common line cards.

Caution The NCS 2006 system can work with a single control card (TNC, TNCE, TSC, or TSCE). The TNC, TNCE, TSC, and TSCE cards cannot operate in a shelf at the same time.

The shelf assembly slots have symbols indicating the type of cards that you can install in them. Each card has a corresponding symbol. The symbol on the card must match the symbol on the slot.

Figure 2: Slot Symbols



The following shows the slot and card symbol definitions.

Table 4: Slot and Card Symbols

Symbol Color/Shape	Definition
Purple/Square	Slots 1 and 8. TNC/TNCE/TSC/TSCE card slot. Install cards only with a square symbol on the faceplate.
Orange/Circle	Slots 2 to 7. Install cards only with a circle symbol on the faceplate.
Orange/Hollow Circle	Slots 2 to 7. New line cards with high-speed backplane connectors.
Pink/Pentagon	Slots 4 and 5. New Uplink card.

Note When the NCS 2006 shelf is powered at –60 VDC (nominal), only TNC, OPT-AMP-C, OPT-AMP-17-C, OPT-EDFA-17, OPT-EDFA-24, and NCS 2006 ECU can be installed.

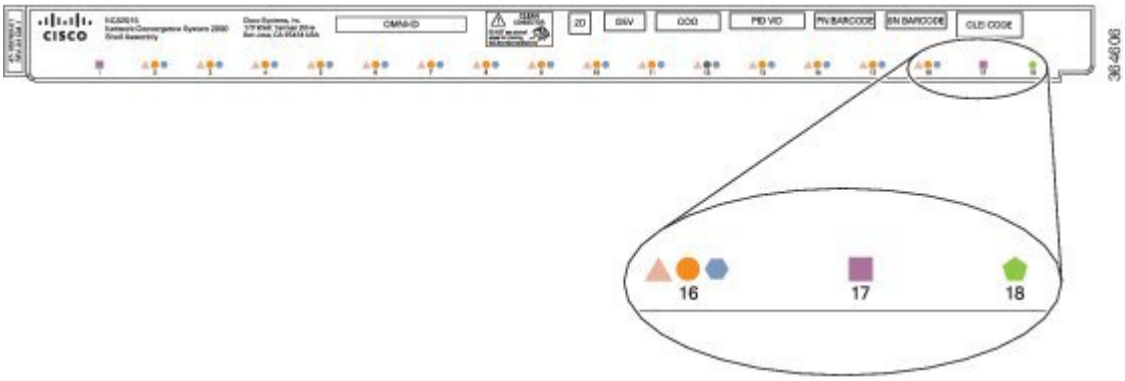
NCS 2015

The NCS 2015 shelf assemblies have 18 card slots numbered sequentially from left to right. Slots 1 and 17 are reserved for control cards (TNCS or TNCS-O). Slots 2 through 16 are dedicated for common line cards and slot 18 is reserved for the ECU.

Caution The NCS 2015 system can work with a single control card (TNCS or TNCS-O.)

The shelf assembly slots have symbols indicating the type of cards that you can install in them. Each card has a corresponding symbol. The symbol on the card must match the symbol on the slot.

Figure 3: Slot Symbols



The folowing table shows the slot and card symbol definitions.

Table 5: Slot and Card Symbols

Symbol Color/Shape	Definition
Purple/Square	Slots 1 and 17. TNCS or TNCS-O card slot.
Orange/Circle	Slots 2 through 16. Install only cards with a circle symbol on the faceplate.
Pink/Triangle	Slots 2 through 16. Install only line cards with circle or a triangle symbol on the faceplate.
Blue/Hexagon	Slots 2 through 16. Install only line cards with a blue hexagon symbol on the faceplate.
Green/Pentagon	Slot 18. ECU slot.

Card Replacement

To replace a card with another card of the same type, you do not need to make any changes to the database; remove the old card and replace it with a new card. To replace a card with a card of a different type, physically remove the card and replace it with the new card, then delete the original card from CTC. For specifics, refer to the “Maintain the Node” chapter in the *Cisco NCS 2000 Series Network Configuration Guide* .

Caution Removing any active card from the shelf can result in traffic interruption. Use caution when replacing cards and verify that only inactive or standby cards are being replaced. If the active card needs to be replaced, switch it to standby prior to removing the card from the node.

Note An improper removal (IMPROPRMVL) alarm is raised whenever a card pull (reseat) is performed, unless the card is deleted in CTC first. The alarm clears after the card replacement is complete.

NTP-L41 Unpacking and Inspecting the Shelf

Purpose	This procedure explains how to unpack the NCS 2002, NCS 2006, and NCS 2015 shelves and verify their contents.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

Step 1 Complete the DLP-L62 Unpacking and Verifying the Shelf , on page 11.

Step 2 Complete the DLP-L63 Inspecting the Shelf, on page 14.

Stop. You have completed this procedure.

DLP-L62 Unpacking and Verifying the Shelf

Purpose	This task removes the shelves from the package.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	Required

Onsite/Remote	Onsite
Security Level	None

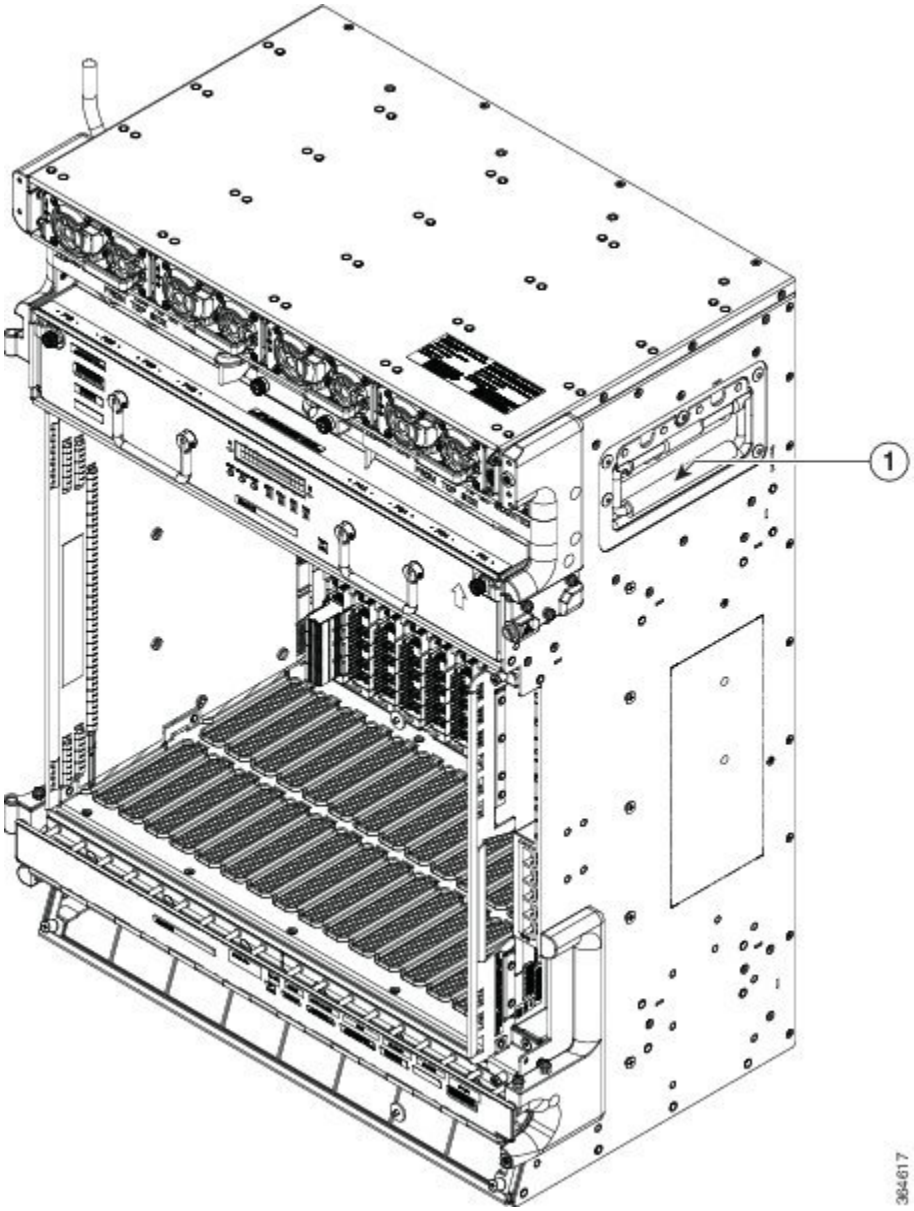
Procedure

Step 1 When you receive the NCS 2002, NCS 2006, or NCS 2015 system equipment at the installation site, open the top of the box. The Cisco Systems logo designates the top of the box.

Step 2 Remove the foam inserts from the box. The box contains the NCS shelf (wrapped in plastic) and a smaller box of items needed for installation.

Step 3 To remove the shelf, grasp both rings of the shelf removal strap and slowly lift the shelf out of the box. The NCS 2015 chassis has lifting handles at either side for this purpose (see figure below).

Figure 4: Handling the NCS 2015 DC Chassis During Installation



1	Lifting handle

Step 4 Open the smaller box of installation materials, and verify that you have all items listed in the Required Tools and Equipment, on page 3.

Note
If the NCS 2006 shelf and ancillary units are ordered separately, then the power modules, LCD module, NCS HIG 2006 ECU module, fan-tray assembly, and mounting brackets are shipped separately.

Step 5 Return to your originating procedure (NTP).

DLP-L63 Inspecting the Shelf

Purpose	This task verifies that all parts of the shelf are in good condition.
Tools/Equipment	None
Prerequisite Procedures	DLP-L62 Unpacking and Verifying the Shelf , on page 11
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Procedure

Step 1 (Cisco NCS 2002 and NCS 2006) Open the shelf removing temporary door or standard door. For more information, see the DLP-L46 Removing the Standard Door of the NCS 2002 Shelf and DLP-L13 Removing the Standard Door of the NCS 2006 Shelf.

Step 2 Verify the following:

- The pins are not bent or broken.
- The frame is not bent.

Step 3 If the pins are bent or broken, or the frame is bent, call your Cisco sales engineer for a replacement.

Step 4 Return to your originating procedure (NTP).