



Intel® Server D50TNP Family

Intel® Server Board D50TNP

Intel® D50TNP Modules

Intel® Server System D50TNP

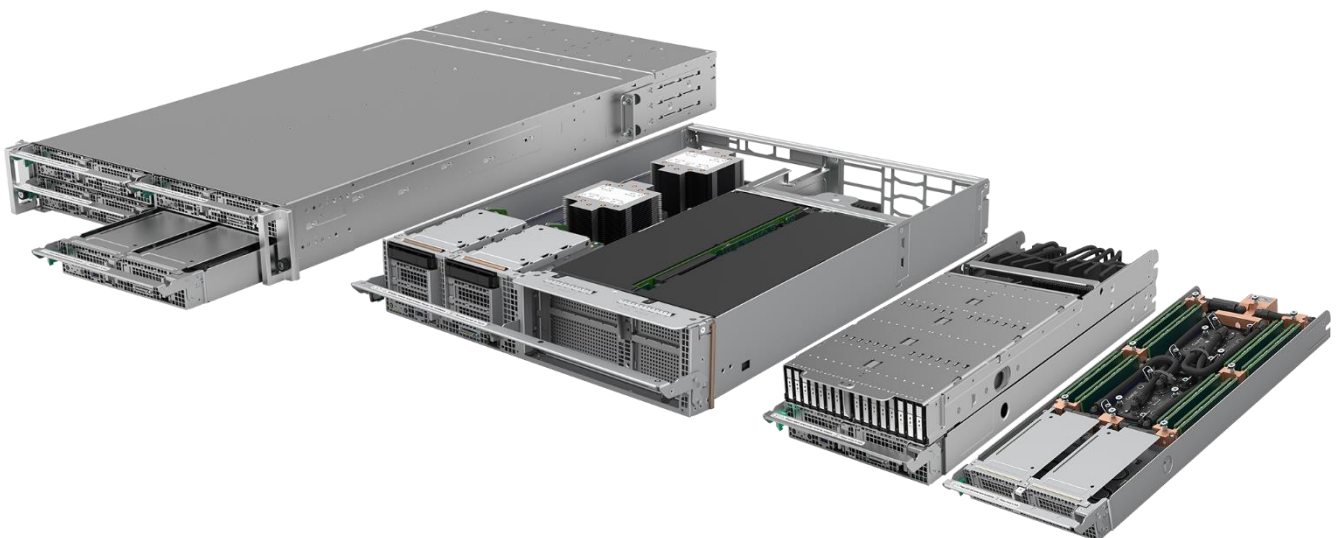
Integration and Service Guide

A guide providing instructions for the insertion and extraction of system components and available Intel accessories and spares.

Rev. 1.4

March 2022

D50TNP



Delivering Breakthrough Data Center System Innovation – Experience What's Inside!

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Document Revision History

| Date | Revision | Changes |
|--------------|----------|--|
| May 2021 | 1.0 | Initial production release. |
| July 2021 | 1.1 | <ul style="list-style-type: none"> • Table 1. Added two Intel® DCM documents and the 3rd Generation Intel® Xeon® Scalable Processor TMSDG. • Section 7.17, "Server Board Replacement". Updated the two figures in this section and Step 8. • Appendix B, "Memory Population Rules". <ul style="list-style-type: none"> ○ Added DDR4 Disclaimer ○ Table 5. <ul style="list-style-type: none"> - Updated first column of row for Silver 4300 processors, - Added note below table • Appendix G, "Product Safety – Multi-Language". Updated appendix • Minor edits throughout for clarity |
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| March 2022 | 1.4 | <ul style="list-style-type: none"> • Section 7.11, "Accelerator Module Add-in Card Replacement (iPC D50TNP2MFALAC Only)". Added step 3 • Minor edits throughout for clarity |

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Warnings

Heed safety instructions: Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products/components will void the UL listing and other regulatory approvals of the product. It will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power buttons on the front panel of each module DO NOT turn off the server chassis AC power. To remove power from the server chassis, you must unplug the AC power cord from the electrical outlet. Make sure the AC power cord is unplugged before you open the server chassis.

To service a module, it is not necessary to power down the entire system. Power off only the module requiring servicing before attempting to remove it from the server chassis.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the module and disconnect all telecommunications systems, networks, and modems attached to it before removing it from the server chassis. Otherwise, personal injury or equipment damage can result.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the pins on the board.

Electrostatic Discharge (ESD)

Electrostatic discharge can damage your computer or the components within it. ESD can occur without the user feeling a shock while working inside the system chassis or while improperly handling electronic devices like processors, memory or other storage devices, and add-in cards.



Intel recommends the following steps be taken when performing any procedures described within this document or while performing service to any computer system.

- Where available, all system integration and/or service should be performed at a properly equipped ESD workstation.
- Wear ESD protective gear like a grounded antistatic wrist strap, sole grounders, and/or conductive shoes.
- Wear an anti-static smock or gown to cover any clothing that may generate an electrostatic charge.
- Remove all jewelry.
- Disconnect all power cables and cords before opening the Server Chassis
- Power down the Module and remove it from the Server Chassis, remove power feed from the Server Board before performing any integration or service
- Touch any unpainted metal surface of the chassis before performing any integration or service.

- Hold all circuit boards and other electronic components by their edges only.
- After removing electronic devices from the system or from their protective packaging, place them component side up on to a grounded anti-static surface or conductive foam pad. **Do not** place electronic devices on to the outside of any protective packaging.

Caution: Slide/rail mounted equipment is not to be used as a shelf or a work space.



Intel warrants that this product will perform to its published specifications. However, all computer systems are inherently subject to unpredictable system behavior under various environmental and other conditions.

This product is not intended to be the sole source for any critical data and the user must maintain a verified backup. Failure to do so or to comply with other user notices in the product user guide and specification documents may result in loss of or access to data.

Weight of the system:

- Remove all installed modules from the system before attempting to install the system into the rack.
- Due to the weight of a system, Intel recommends carrying the system with two people supporting the system from the sides or using a mechanical lift or a cart when moving the system from one location to another.
- If your system has rack handles installed, do not lift or carry the system by the rack handles
- When lifting or moving a chassis, always grasp it by all four corners. Do not grasp the chassis by two points at opposing diagonal corners, doing so may damage the internal components.
- If you can only grasp the chassis at two different points, always grasp the chassis by the sides at the midpoint.

Liquid cooling safety guidelines:

- Make sure there are no leaks and/or damaged parts before operating the liquid cooling system.
- Do not energize the system or any installed modules if the liquid cooling subsystem is compromised.
- Do not attempt to perform any service to the server chassis before removing power to the system. Turn off and disconnect power from the chassis before disconnecting the liquid cooling quick disconnect tube connectors from the back of the chassis. Turn off the modules before disconnecting the liquid cooling quick disconnect tube connectors.
- To reduce the risk of damage to the cooling system, use care when installing or removing the liquid-cooled modules.
- Avoid excessive force when connecting and disconnecting quick disconnect couplings.
- Keep the liquid cooling tubing clear of pinch points when installing or removing the server modules in/from the chassis.

Important Safety Certification Standards and Transition Support Information

The IEC 60950-1 2nd Edition safety standard (Information Technology Equipment) is going through a replacement phase due to the new IEC 62368-1 3rd Edition safety standard (Audio/Video, Information, and Communication Technology Equipment).

Intel® server systems identified in this service guide are certified to:

- The new IEC 62368-1 3rd Edition standard for countries that have adopted this new standard.
- The outgoing IEC 60950-1 2nd Edition standard for countries that have not yet adopted the new standard.

During the global adoption/certification transition phase between the outgoing and new standards, safety requirement differences between the standards may temporarily dictate restricted usage of Intel® server system products as follows:

- In countries that have adopted the new IEC 62368-1 3rd Edition standard, no location restrictions apply beyond the standard intended application use requirements.
- In countries that have not yet adopted the new IEC 62368-1 3rd Edition standard, restricted access locations are required. Access in these locations is permitted only by technically trained and qualified personnel who are aware of potential safety hazards.

Note: This requirement applies only to Intel® server system products released in 2019 or later. Legacy Intel® server system products (released in 2018 or earlier) provide safeguards that require no additional access restrictions.

Explanation of temporary restricted access location measures

The new IEC 62368-1 3rd Edition standard does not consider 240 video acceleration an energy hazard. The outgoing IEC 60950-1 2nd Edition standard does consider 240 VA an energy hazard, therefore Intel® server system products released in 2019 or later certified to this standard require restricted access locations. Legacy Intel® server system products (released in 2018 or earlier) were designed with additional safeguards to meet IEC 60950-1 2nd Edition standard 240 VA requirements, so no location restrictions apply beyond the standard intended application use requirements. After the IEC 60950-1 standard is phased out globally and Intel® server system products are certified to the new IEC 62368-1 standard, the temporarily restricted access locations will no longer be required.

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1. Introduction

The Intel® Server D50TNP Family consists of products that are designed to support demanding high-performance computing (HPC) and artificial intelligence (AI) applications and workloads. The product family includes a variety of different independent modules that can be accommodated in a flexible 2U rack-mount chassis. The modules support the 3rd Gen Intel® Xeon® Scalable processors that deliver a high core count alongside new hardware-enhanced security features. Previous generation Intel® Xeon® processor and Intel® Xeon® Scalable processor families are not supported.

For details on all system and module features, refer to the *Intel® Server D50TNP Family Technical Product Specification* listed in [Table 1](#).

Note: In this document, the product name **Intel® D50TNP Modules** refers to all module types supported by the Intel® Server D50TNP Family: **Compute Module, Management Module, Storage Module, and Accelerator Module**.

In this document, the product name **Intel® Server D50TNP Family** refers to **Intel® Server Board D50TNP, Intel® D50TNP Modules, and Intel® Server System D50TNP**.

Note: In this service guide, the 3rd Gen Intel® Xeon® Scalable processor family may be referred to simply as “processor”.

For the latest revision of this document, see [Table 1](#).

About This Document

This setup and service guide provides system integrators and service technicians with instructions for the installation and removal of system components. The document also provides available Intel accessories supported by this server system.

The document is organized into two sections. The first section (Chapters 2 through 4) is focused on the installation of system components and accessories into an L6 or L9 integrated server system¹.

The second section (Chapters 6, 7, and appendices A-F) is focused on system service. This section provides the service technician with valuable system information and procedures necessary to successfully identify and replace a faulty system component.

System Integration

Chapter 2 – L6 System Integration – Essential System Components – Installation procedures for the following system components: Processors, Memory, and Power Supply

Chapter 3 – L9 System Integration - Installation procedures for system options and accessories

Chapter 4 – System Software Update and Configuration – A short overview describing the system software stack installed on new Intel servers and where to get the latest revisions.

Chapter 5 – System Packaging Assembly Instructions – Packing instructions for shipments of fully integrated systems

¹ An L6 integrated system requires essential components to be installed to make it power-on ready. An L9 integrated system is power-on ready but may require additional options and/or accessories to be installed to enable specific system features.

System Service

Chapter 6 – System Service – System Features Overview. An overview that identifies and locates the features associated with the Intel® Server System D50TNP family.

Chapter 7 – System Service – FRU Replacement. Installation and replacement procedures for system field replaceable units (FRUs).

Appendix A – Getting Help. Provides server system support and contact information.

Appendix B – General Memory Population Rules. Summary of general memory population rules.

Appendix C – System Status LED State Definitions. System status LED operating states and definition.

Appendix D – Onboard Configuration and Service Jumpers. Descriptions of jumpers on the D50TNP server board.

Appendix E – POST Code Diagnostic LED Decoder. List of post progress codes and error codes.

Appendix F – POST Code Errors. List of POST code errors that represent specific failures, warnings, or information.

Appendix G – Product Safety – Multi-language

1.1 Reference Documents and Support Collaterals

For additional information, see the product support collaterals specified in the following table. The following webpage provides support information for the Intel® Server D50TNP Family:

<https://www.intel.com/content/www/us/en/support/products/201583.html>

Table 1. Intel® Server D50TNP Family Reference Documents and Support Collaterals

| Topic | Document Title or Support Collateral | Document Classification |
|--|--|-------------------------|
| Technical information about this product family | <i>Intel® Server D50TNP Family</i> Technical Product Specification | Public |
| System integration instructions and service guidance | <i>Intel® Server D50TNP Family Integration and Service Guide</i> | Public |
| Server configuration guidance and compatibility | <i>Intel® Server D50TNP Family Configuration Guide</i> | Public |
| Information on the Integrated BMC Web Console | <i>Integrated Baseboard Management Controller Web Console (Integrated BMC Web Console) User Guide</i> | Public |
| BIOS technical information on product family | <i>BIOS Firmware External Product Specification (EPS)</i> | Intel Confidential |
| IOS setup information on product family | <i>BIOS Setup Utility User Guide</i> | Public |
| BMC technical information on product family | <i>Integrated Baseboard Management Controller Firmware External Product Specification (EPS)</i> | Intel Confidential |
| Base specifications for the IPMI architecture and interfaces | <i>Intelligent Platform Management Interface Specification Second Generation v2.0</i> | Intel Confidential |
| Specifications for the PCIe* 3.0 architecture and interfaces | <i>PCIe* Base Specification, Revision 3.0</i> http://www.pcisig.com/specifications | Public |
| Specifications for the PCIe* 4.0 architecture and interfaces | <i>PCIe* Base Specification, Revision 4.0</i> http://www.pcisig.com/specifications | Public |
| TPM for PC Client specifications | <i>TCG PC Client Platform TPM Profile Specifications revision 2.0</i> | Public |

Intel® Server D50TNP Family Integration and Service Guide

| Topic | Document Title or Support Collateral | Document Classification |
|---|--|-------------------------|
| Functional specifications of 3 rd Gen Intel® Xeon® Scalable processor family | <i>3rd Generation Intel® Xeon® Scalable Processors, Codename Ice Lake-SP External Design Specification (EDS): Document IDs: 574451, 574942, 575291</i> | Intel Confidential |
| Processor thermal design specifications and recommendations | <i>3rd Generation Intel® Xeon® Scalable Processor, Codename Ice Lake-SP and Cooper Lake-SP - Thermal and Mechanical Specifications and Design Guide: Document ID 574080</i> | Intel Confidential |
| BIOS and BMC Security Best Practices | <i>Intel® Server Systems Baseboard Management Controller (BMC) and BIOS Security Best Practices White Paper</i> https://www.intel.com/content/www/us/en/support/articles/00005785/server-products.html | Public |
| Managing an Intel Server Overview | <i>Managing an Intel Server System 2020</i> https://www.intel.com/content/www/us/en/support/articles/000057741/server-products.html | Public |
| Technical information on Intel® Optane™ persistent memory 200 | <i>Intel® Optane™ Persistent Memory 200 Series Operations Guide</i> | Intel Confidential |
| Setup information for Intel® Optane™ persistent memory 200 | <i>Intel® Optane™ Persistent Memory Startup Guide</i> | Public |
| Latest system software updates: BIOS and Firmware | <i>Intel® System Update Package (SUP) for Intel® Server D50TNP Family</i> | Public |
| | <i>Intel® Server Firmware Update Utility - Various operating system support</i> | |
| | <i>Intel® Server Firmware Update Utility User Guide</i> | |
| To obtain full system information | <i>Intel® Server Information Retrieval Utility - Various operating system support</i> | Public |
| | <i>Intel® Server Information Retrieval Utility User Guide</i> | |
| To configure, save, and restore various system options | <i>Intel® Server Configuration Utility - Various operating system support</i> | Public |
| | <i>Intel® Server Configuration Utility User Guide</i> | |
| Product Warranty Information | <i>Warranty Terms and Conditions</i> https://www.intel.com/content/www/us/en/support/services/000005886.html | Public |
| Safety and Regulatory Compliance Information | <i>Intel® Server D50TNP Family Technical Product Specification</i> | Public |
| Intel® Data Center Manager (Intel® DCM) information | <i>Intel® Data Center Manager (Intel® DCM) Product Brief</i> https://software.intel.com/content/www/us/en/develop/download/dcm-product-brief.html | Public |
| | <i>Intel® Data Center Manager (Intel® DCM) Console User Guide</i> https://software.intel.com/content/www/us/en/develop/download/dcm-user-guide.html | Public |

Note: Intel Confidential documents are made available under a Non-Disclosure Agreement (NDA) with Intel and must be ordered through your local Intel representative.

2. L6 Integrated System – Essential System Component Installation

The Intel® D50TNP Modules are offered with different levels of system integration. System modules that are not power-on ready are identified as L6 integrated modules; L6 modules require essential components (sold separately) to be installed. If your Intel D50TNP Module did not come preinstalled with any of the following components, follow the procedures in this chapter:

- 2 processors – 3rd Gen Intel® Xeon® Scalable processors
- Memory – Up to 16 DDR4 DIMMs for D50TNP1MHCRCAC, D50TNP1MHCRLC and D50TNP1MHEVAC, and up to 16 DDR4 + 8 Intel® Optane™ persistent memory 200 series DIMMs for all other modules.

If your Intel D50TNP Module came preinstalled with all the components listed above, skip this chapter and go to [Chapter 3](#) for installation procedures associated with all other system options and accessories.

To complete the L6 integration of the D50TNP Intel® Server System to be power-on ready, a chassis from Intel® Server chassis FC2000 family is required to house the L6 integrated modules. The chassis for L6 systems is sold separately and comes with 1600 W or 2100 W power supply units preinstalled.

Each module within a system configuration is independently operated from the others. The installed modules within a system chassis share resources like power and cooling. [Table 2](#) describes the different ways an Intel® Server System D50TNP can be configured.

For additional information regarding configuration options, see the *Intel® Server D50TNP Family Configuration Guide*.

Table 2. Intel® D50TNP Modules

| Module Type | iPC | Height | Width | Cooling | Maximum Processor Thermal Design Power (TDP) | Modules per Chassis |
|-------------|----------------|--------|------------|---------------|--|---------------------|
| Compute | D50TNP1MHCPAC | 1U | Half width | Air cooled | 205 W | Up to four |
| | D50TNP1MHCRCAC | | | | 205 W | |
| | D50TNP1MHEVAC | | | | 270 W | |
| | D50TNP1MHCRLC | | | Liquid cooled | 270 W | Up to four |
| Management | D50TNP2MHSVAC | 2U | Half width | Air cooled | 270 W | Up to two |
| Storage | D50TNP2MHSTAC | 2U | Half width | Air cooled | 205 W | Up to two |
| Accelerator | D50TNP2MFALAC | 2U | Full width | Air cooled | 270 W | One |

Mixing different types of modules in the same chassis can be done as follows:

- Up to two 1U air-cooled Compute Modules with one 2U Management Module
- Up to two 1U air-cooled Compute Modules with one 2U Storage Module
- One 2U Management Module with one 2U Storage Module

Before You Begin

Before integration of any system components, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this guide.

System Reference

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the chassis and the front of a module as shown in the following figure (1U air-cooled Compute Module shown).

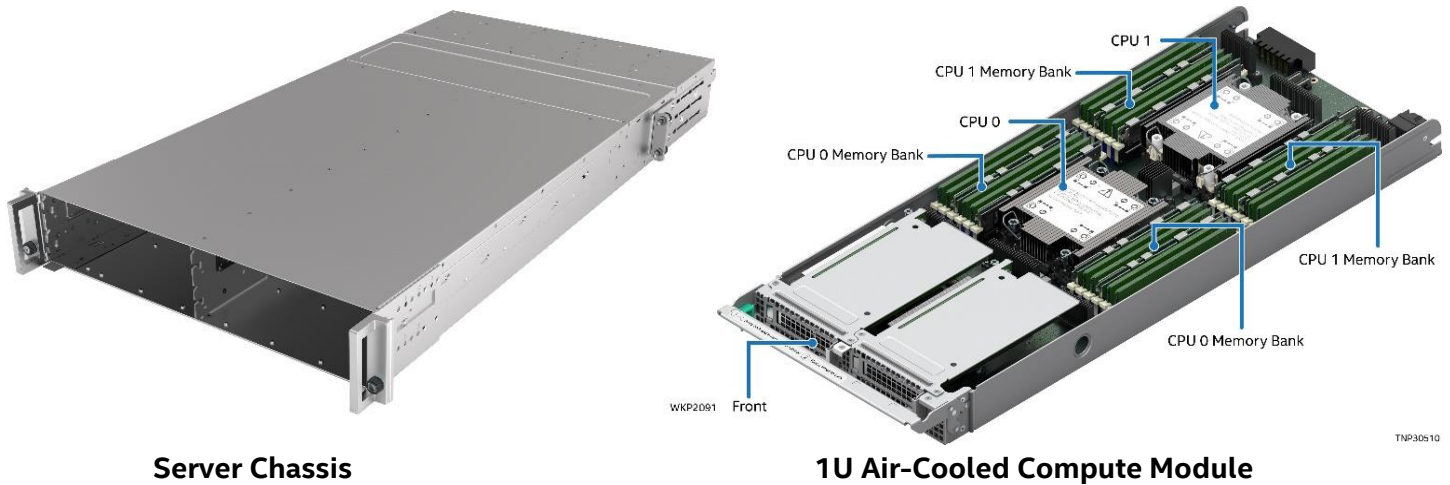


Figure 1. System Directional Reference

Instruction Format

Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.

2.1 Air Duct Removal / Installation

To maintain system thermals for air-cooled modules, the air duct must always be in place when the system is operational. Removal of the air duct is necessary when installing or replacing any system component within the module.

The figures below show the air duct for D50TNP1MHCPAC. However, the steps of air duct removal and installation in this section apply to modules with the following iPCs: D50TNP1MHCPAC, D50TNP1MHCRCAC, D50TNP2MHSVAC, and D50TNP2MFALAC.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

2.1.1 Air Duct Removal

TNP40910

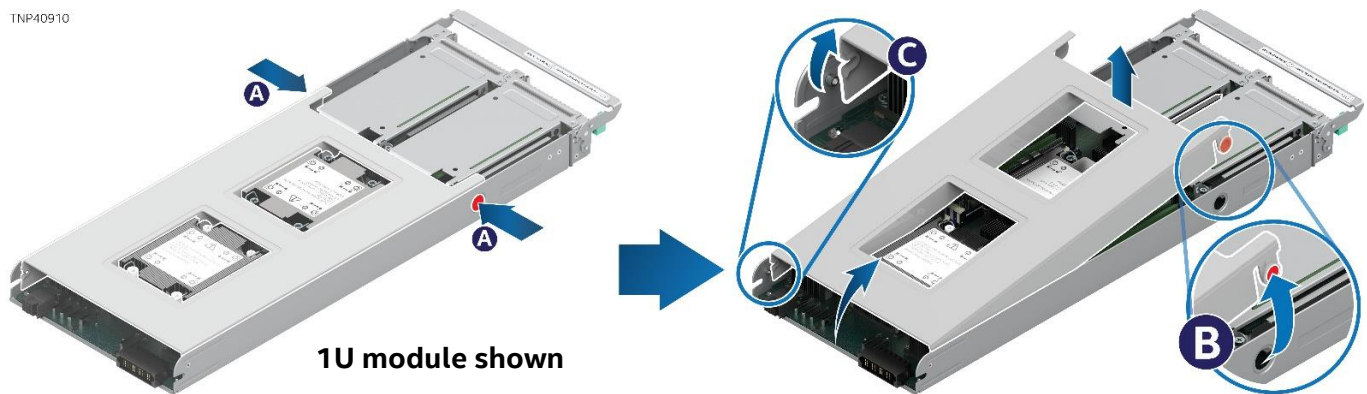
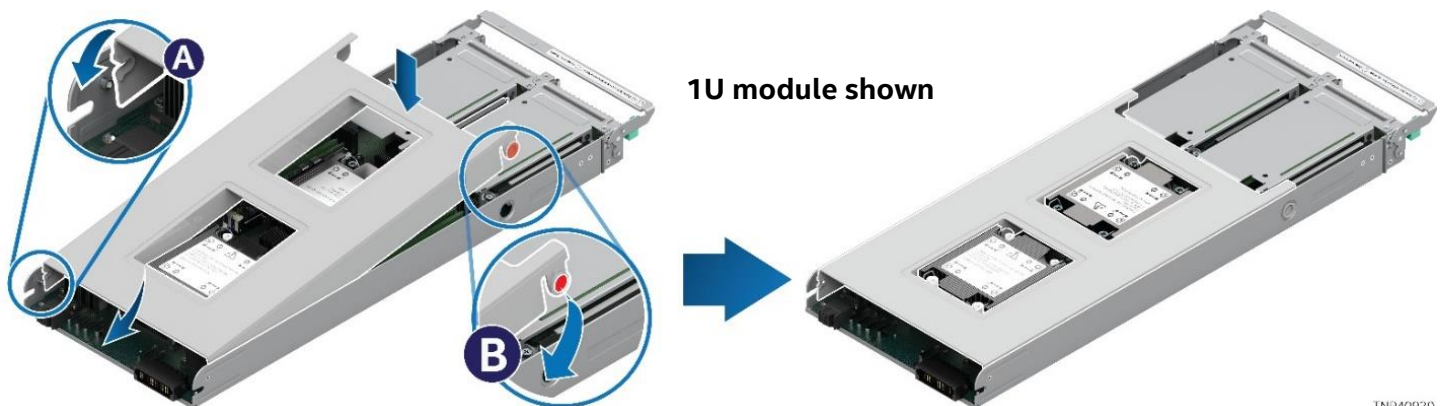


Figure 2. Removing the Air Duct

1. Press the latches on both sides of the module inwards (see Letter A).
2. Carefully lift the front edge of the air duct away from the module (see Letter B).
3. Pull the air duct away from the module (see Letter C).

2.1.2 Air Duct Installation



TNP40920

Figure 3. Installing the Air Duct

1. Align and attach the hinge slots on the back end of the air duct with the hinge posts on both sides of the module (see Letter A).
2. Lower the air duct down until both the left and right side latches snap into place (see Letter B).

2.2 Opening and Closing Storage Module (iPC D50TNP2MHSTAC)

The Storage Module top tray contains the enterprise data center SSD form factor (EDSFF) units while the base of the module contains the processors, memory, and add-in cards. This section provides instructions to open and close the top tray of the storage module.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

2.2.1 Opening the Top Tray

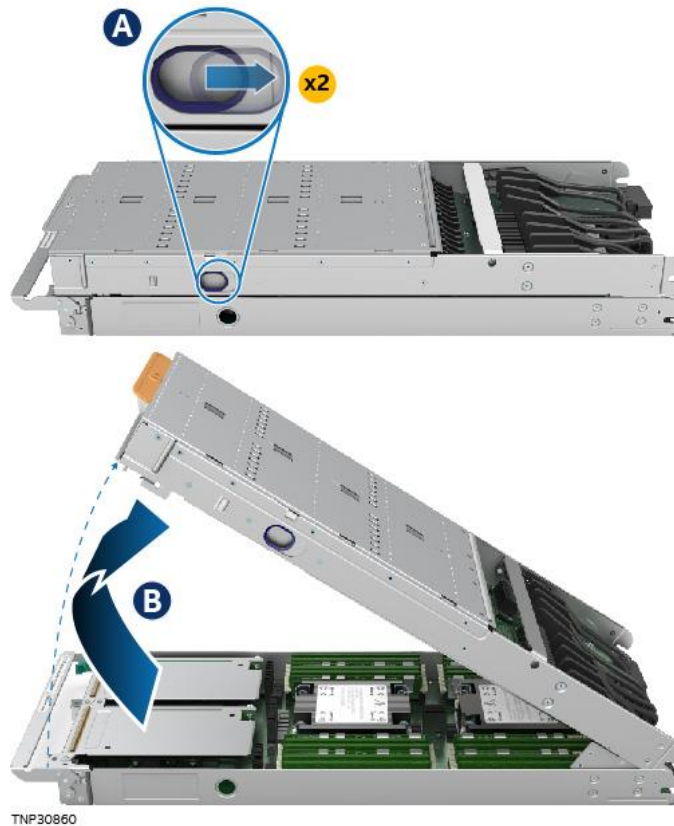


Figure 4. Removing the Air Duct

1. Unlock the latches on both sides of the top tray (see Letter A).
2. Lift the front edge of the top tray slowly until the lock clicks (see Letter B).

2.2.2 Closing the Top Tray

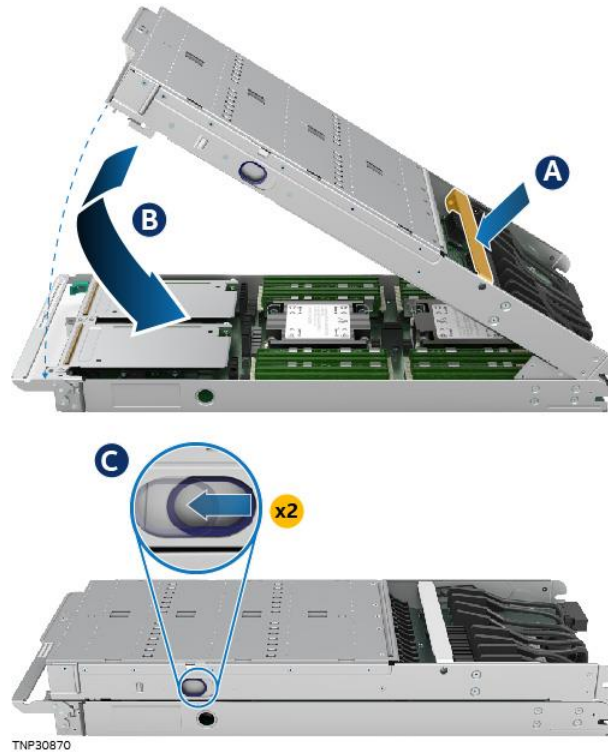


Figure 5. Removing the Air Duct

1. Push up the front edge of the top tray just slightly until the lock releases
2. Push the handle bar down (see Letter A) with one hand. Hold the front edge of the top tray with the other hand and lower it (see Letter B).
3. Lock the latches on both sides of the top tray (see Letter C).

2.3 Processor Assembly and Installation

The Intel® Server D50TNP Family supports 1U height heat sinks and 2U height heat sinks as shown in the following figures. The Compute Module uses 1U height heat sinks. Even though the Storage Module is a 2U height module, it uses the 1U height heat sinks. The Management Module and Accelerator Module use 2U height heat sinks.

There are two types of 2U heat sinks – front heat sink and back heat sink. There are three types of 1U heat sinks – front heat sink, back heat sink, and Enhanced Volume Air Cooling (EVAC) heat sink (front position only). The heat sinks are shown in the following figures. The front heat sink type is used for CPU 0 and the back heat sink type is used for CPU 1. The exploded views in the figures show the difference. The back heat sink types have more heat venting fins.

Note: Heat sinks are not interchangeable. The descriptions above must be followed.

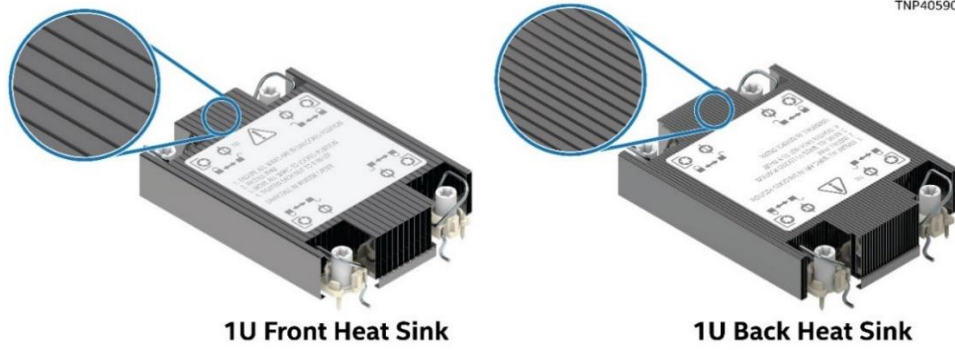
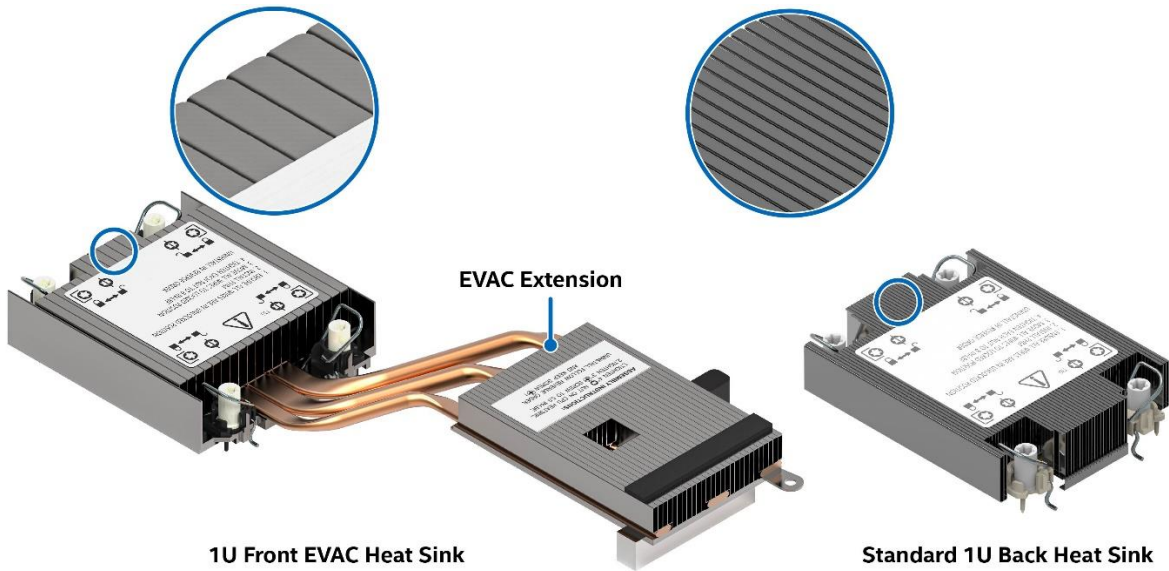


Figure 6. 1U Supported Standard Processor Heat Sinks

The EVAC heat sink is only used in the front for CPU 0. The Compute Module supporting the EVAC heat sink uses the standard back heat sink for CPU 1.



Ref #: TNP41531

Figure 7. 1U Supported EVAC Processor Heat Sinks

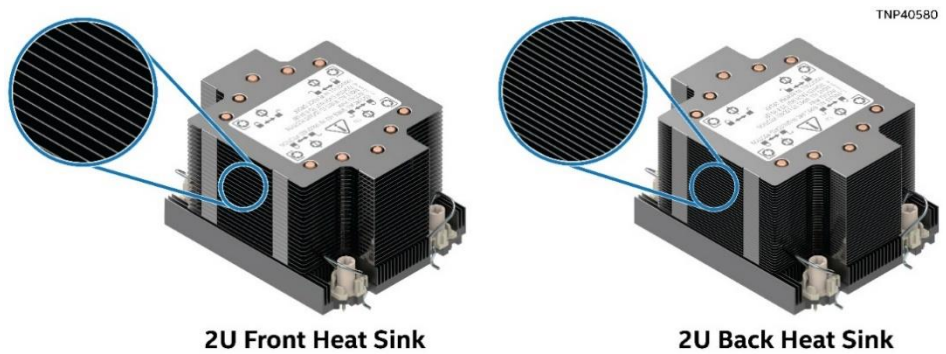
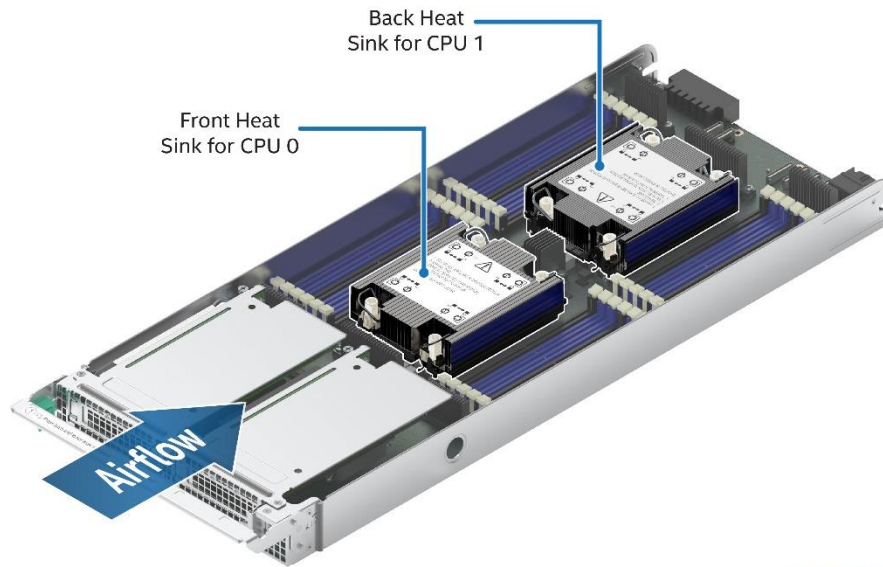


Figure 8. 2U Heat Sinks

The following figure displays a module with 1U front and back heat sinks installed. Only 1U standard front heat sink and 1U back heat sink are shown. However, the concept applies to modules using 1U EVAC front heat sink and 1U back heat sink or 2U front heat sink and 2U back heat sink.



Ref #: TNP30501

Figure 9. 1U Heat Sinks Installed in Module

2.3.1 Assembly and Installation for Standard Air-Cooled Heat Sinks

Components Required:

- 3rd Gen Intel® Xeon® Scalable processors
- Processor carrier clips
- 1U processor heat sinks (front and back) or 2U processor heat sinks (front and back)
- Processor tray as shipped by Intel

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- T-30 Torx* screwdriver
- ESD Gloves

Note: The installation figures in this section only display the 1U front heat sink. However, the processor installation procedure is the same, regardless of the size of the heat sink.

A Processor Heat Sink Module (PHM) assembly and processor socket assembly (or “loading mechanism”) are necessary to install a processor onto the server board. [Figure 10](#) identifies each component associated with the PHM and processor socket assemblies.

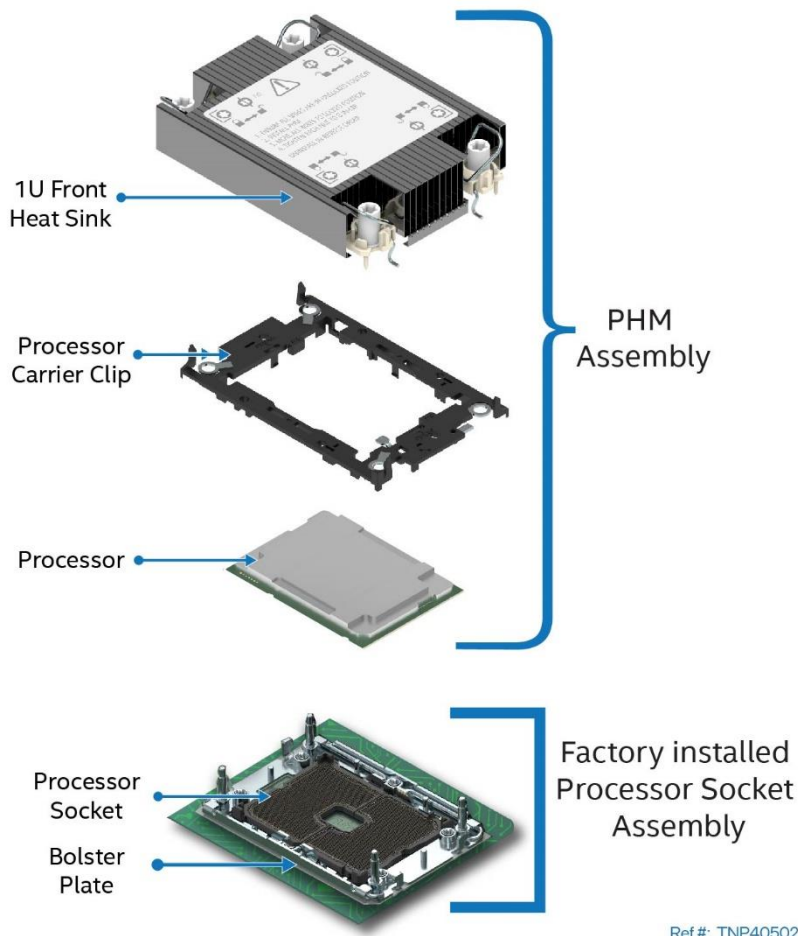


Figure 10. Processor Components and Processor Socket Reference Diagram with Standard Heat Sink

To properly assemble the PHM and install it onto the server board, the procedures described in the following sections must be followed in the order specified. These instructions assume that all the PHM components are new and the Thermal Interface Material (TIM) is already applied to the bottom of the heat sink.

2.3.1.1 Processor Heat Sink Module (PHM) Assembly

Caution: Full ESD precautions should be followed to perform reassembly of the PHM and reinstallation of the PHM to the server board. At no time should the processor itself be handled.

Each component within the PHM assembly includes a Pin 1 indicator. Pin 1 indicator alignment between all components is required throughout the assembly process.

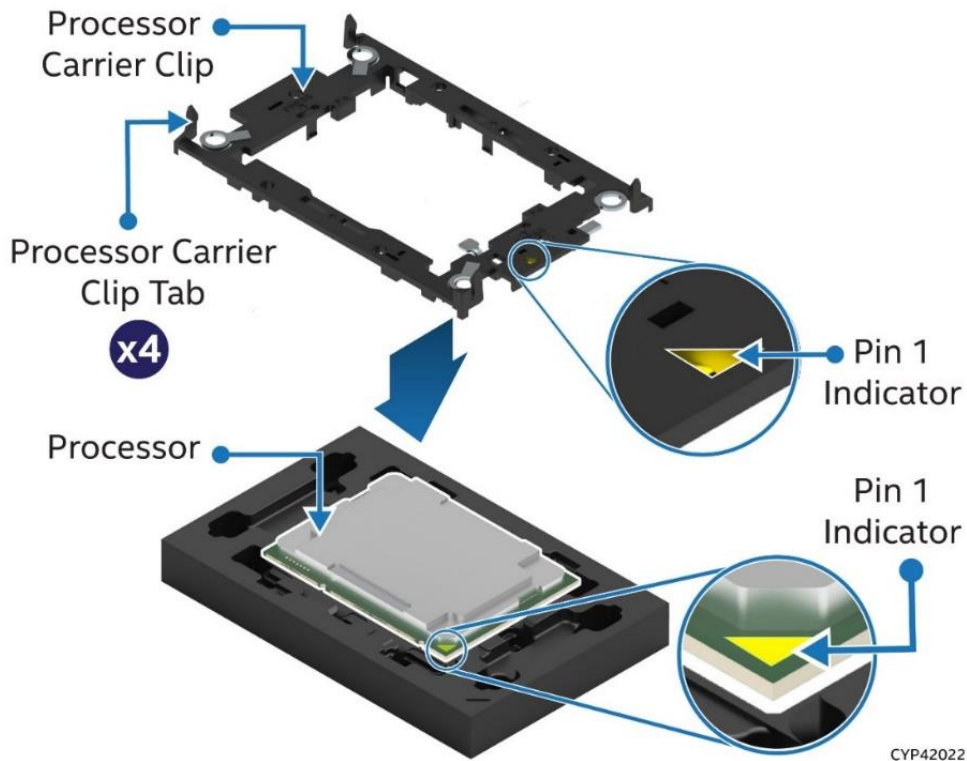


Figure 11. Installing the Processor Carrier Clip onto the Processor – Part 1

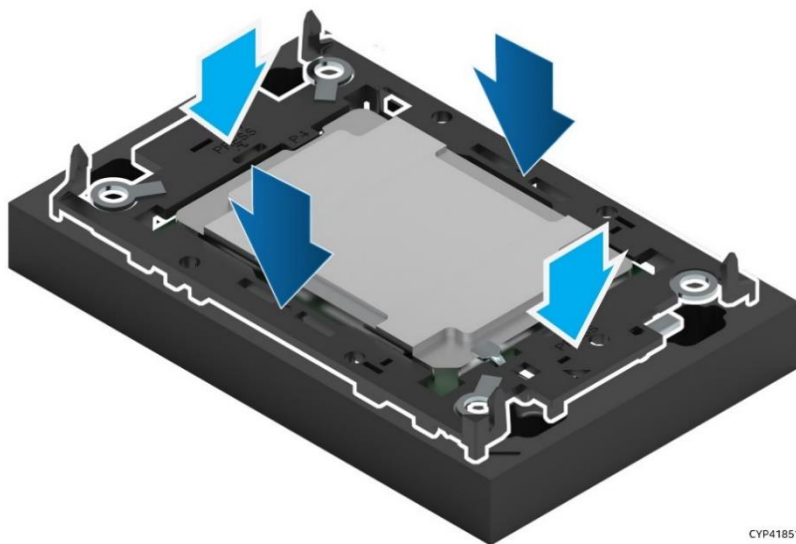


Figure 12. Installing the Processor Carrier Clip onto the Processor – Part 2

1. With the processor still in its tray, place the processor carrier clip over the processor.
2. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.
3. Gently press down simultaneously on two opposite sides of the processor carrier clip until it clicks in place.
4. Repeat step 3 for the other two sides.

5. Locate the processor heat sink. To avoid damage, grasp it by its narrower sides as shown below.

Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following image for proper handling.

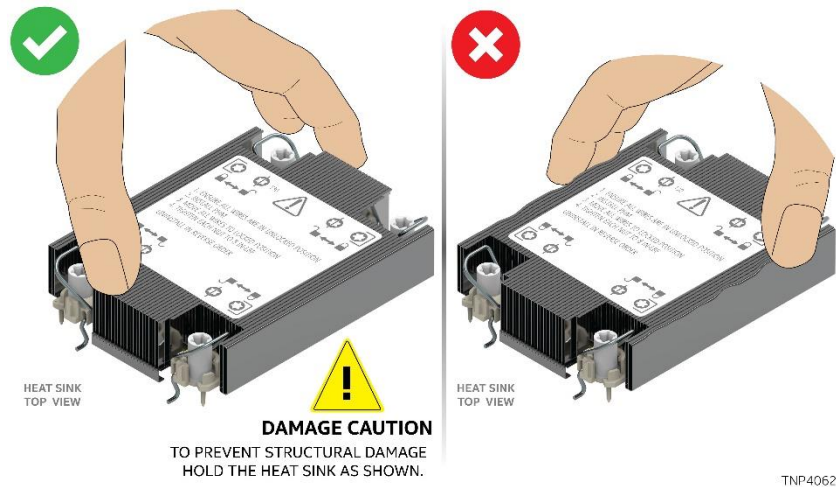


Figure 13. Removing the Heat sink from its Packaging

6. Place the heat sink bottom side up onto a flat surface.
7. Remove the plastic protective film from the Thermal Interface Material (TIM).

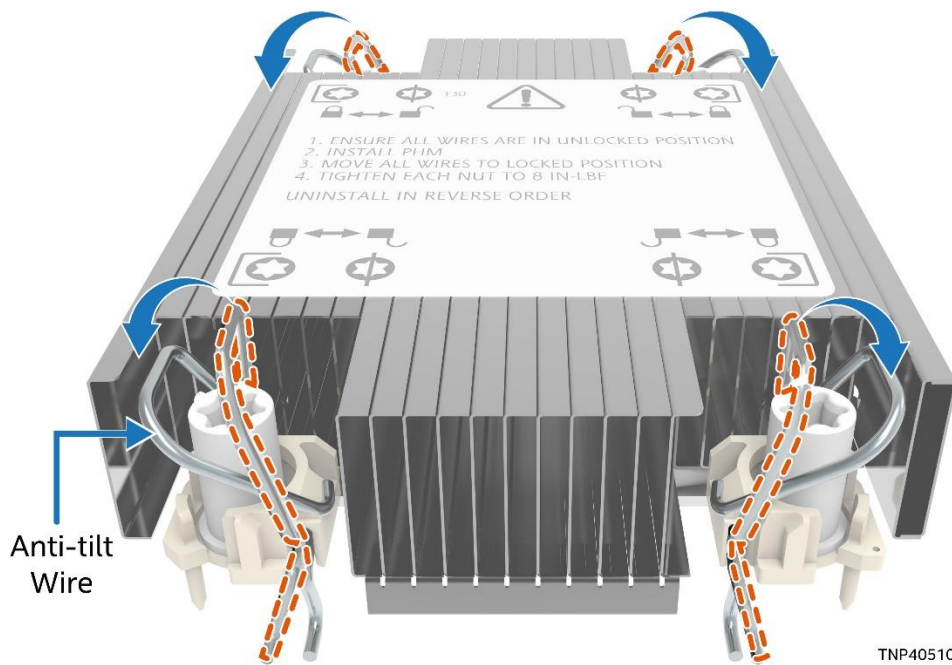


Figure 14. Processor Heat Sink Anti-tilt Wires in the Outward Position

8. Set the anti-tilt wire over each of the four heat sink fasteners to their outward position.

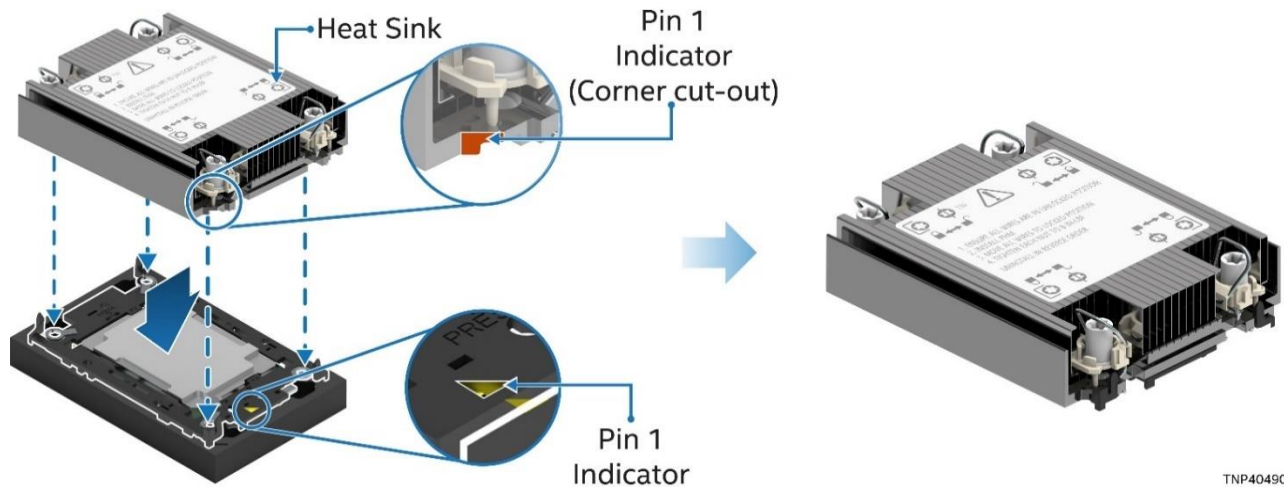


Figure 15. Pin 1 Indicator of Processor Carrier Clip

9. Align the Pin 1 indicator of processor carrier clip with one of the diagonally cut corners on the base of the heat sink. Or (if present) look for the Pin 1 indicator on the corner of the heat sink label.
10. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
11. Ensure that all four heat sink corners are securely latched to the processor carrier clip tabs.

2.3.1.2 PHM Installation

If installed, remove the plastic cover from the processor socket.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

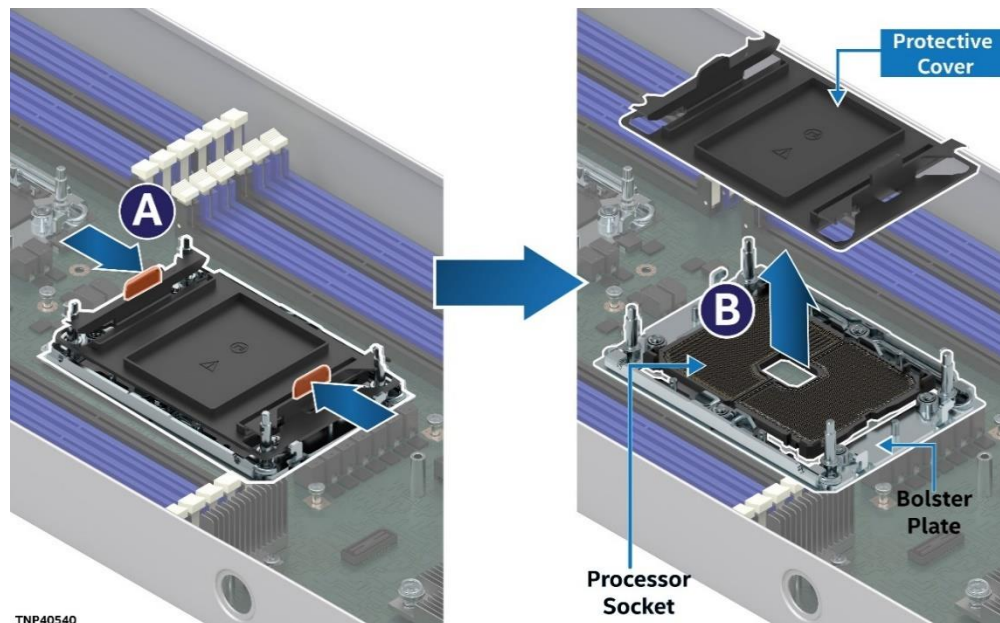


Figure 16. Socket Protective Cover Removal

- Remove the socket protective cover by squeezing the finger grips (see Letter A) and pulling the cover up (see Letter B).
- Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

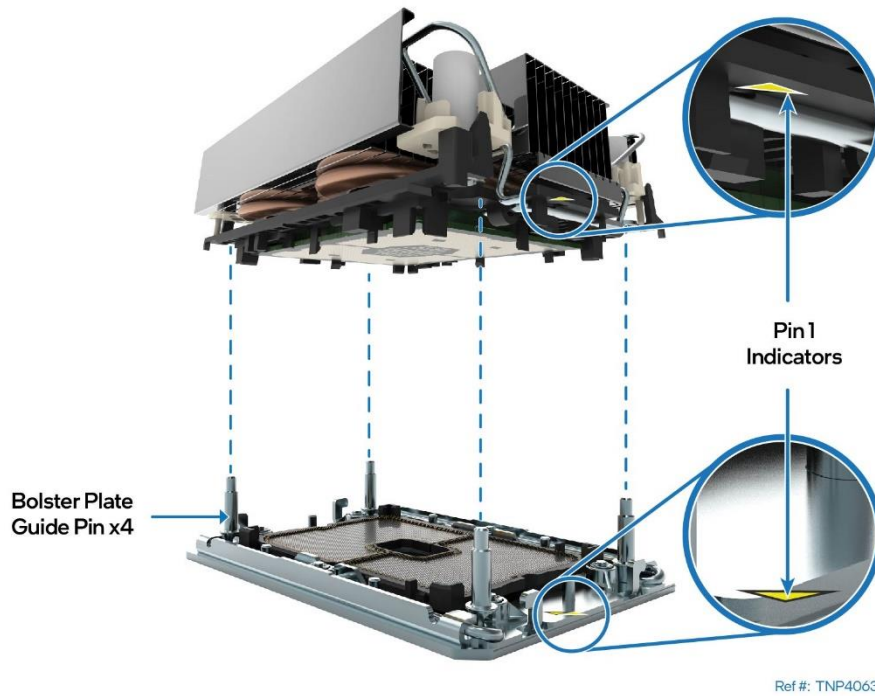


Figure 17. PHM Alignment with the Socket Assembly

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.

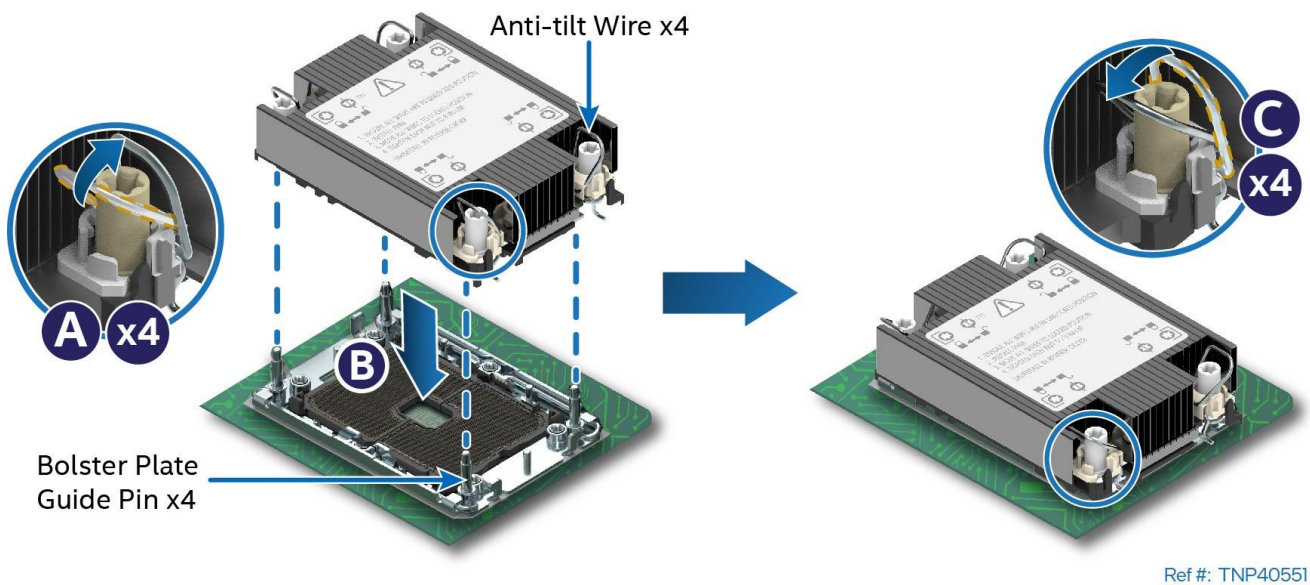


Figure 18. PHM Installation onto the Server Board

1. Set all four anti-tilt wires on the heat sink to the inward position (see Letter A).
2. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the socket assembly bolster plate.
3. Carefully lower it onto the bolster plate's alignment pins (see Letter B).
4. Ensure that the PHM is sitting flat and even on the bolster plate.
5. Set all four anti-tilt wires on the heat sink to the outward position. (see Letter C).

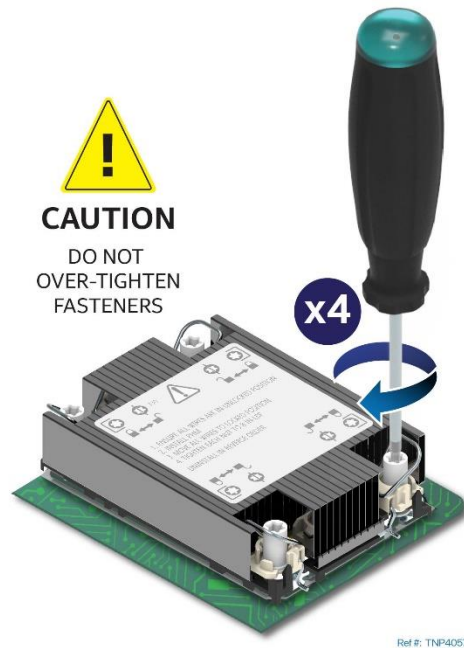


Figure 19. Tighten Heat Sink Fasteners

6. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb. No specific sequence is needed for tightening.
7. Reinstall the air duct (see [Section 2.1.2](#)).

Note: Intel strongly recommends that both processors are installed. If only one processor is installed, do not install a processor heat sink on an empty socket.

2.3.2 Assembly and Installation for EVAC Heat Sinks

Components Required:

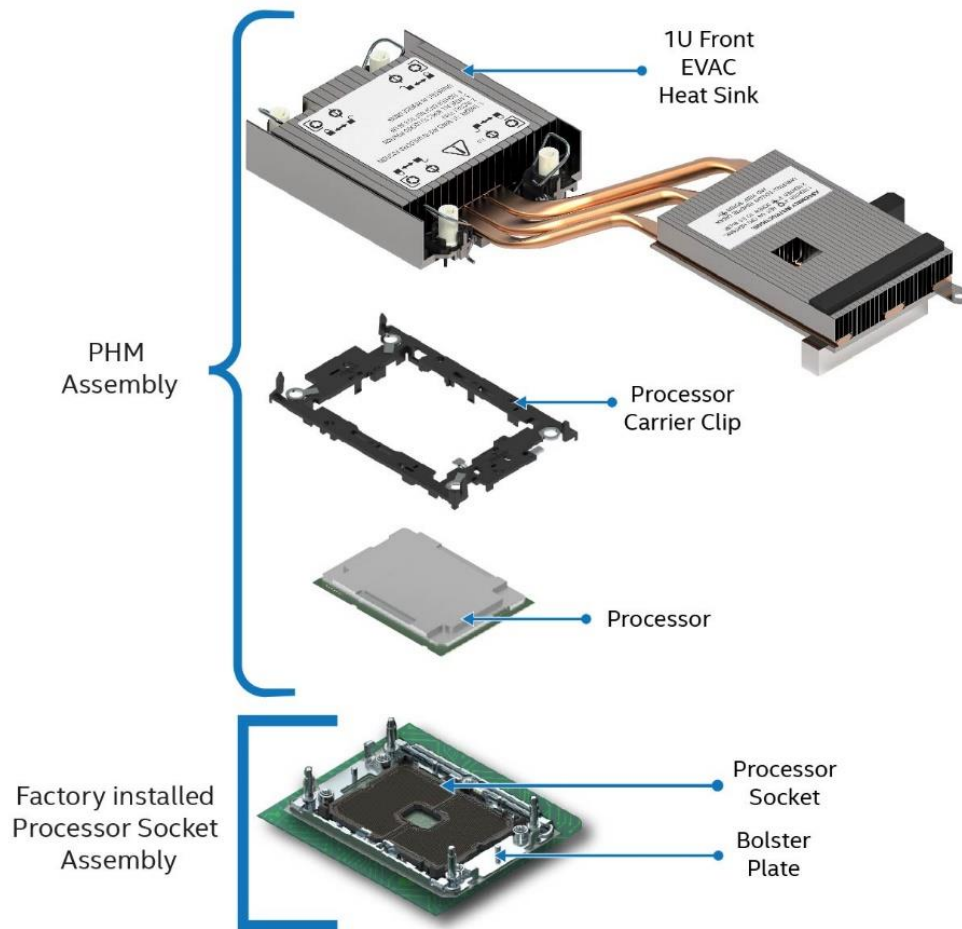
- 3rd Gen Intel® Xeon® Scalable processors
- Processor carrier clips
- 1U EVAC processor heat sink (front) and 1U standard processor heat sink (back)
- Processor tray as shipped by Intel

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- T-30 Torx* screwdriver
- ESD Gloves
- Phillips* head screwdriver #2

Note: The procedures below show the installation for the 1U EVAC processor heat sink (front). To install the 1U standard processor heat sink (back), follow the procedures in [Section 2.3.1](#).

A processor heat sink module (PHM) assembly and processor socket assembly (or “loading mechanism”) are necessary to install a processor onto the server board. [Figure 20](#) identifies each component associated with the PHM and processor socket assemblies.



Ref #: TNP41450

Figure 20. Processor Components and Processor Socket Reference Diagram with EVAC Heat Sink

To properly assemble the PHM and install it onto the server board, the procedures described in the following sections must be followed in the order specified. These instructions assume that all the PHM components are new and the Thermal Interface Material (TIM) is already applied to the bottom of the heat sink.

2.3.2.1 Processor Heat Sink Module (PHM) Assembly

Caution: Full ESD precautions should be followed to perform reassembly of the PHM and reinstallation of the PHM to the server board. The processor itself should Not be handled.

Each component within the PHM assembly includes a Pin 1 indicator. Pin 1 indicator alignment between all components is required throughout the assembly process.

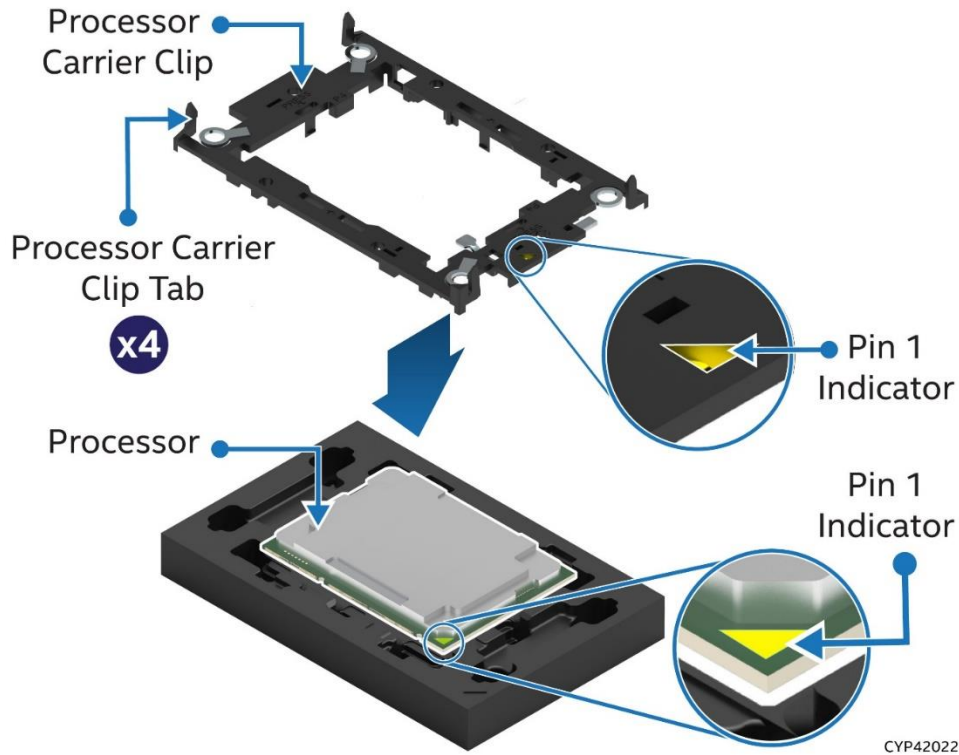


Figure 21. Installing the Processor Carrier Clip onto the Processor – Part 1

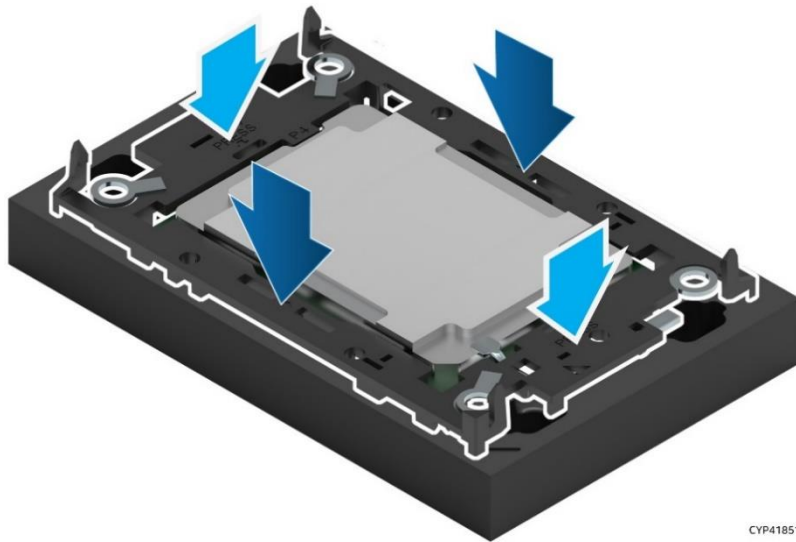


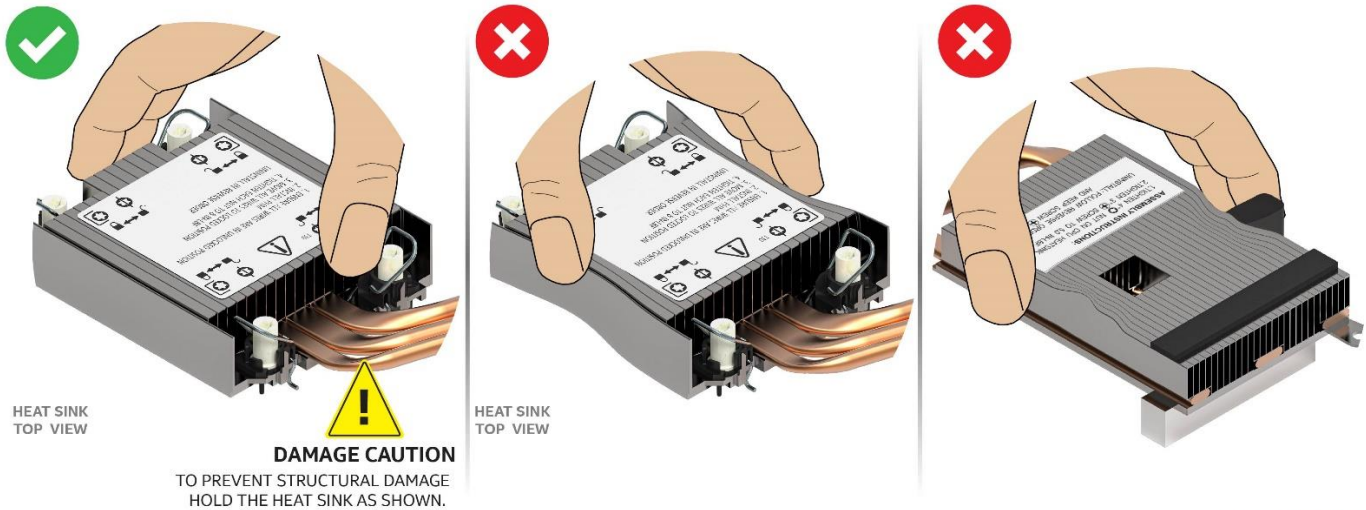
Figure 22. Installing the Processor Carrier Clip onto the Processor – Part 2

1. With the processor still in its tray, place the processor carrier clip over the processor.
2. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.
3. Gently press down simultaneously on two opposite sides of the processor carrier clip until it clicks in place.
4. Repeat step 3 for the other two sides.

- Locate the processor heat sink. To avoid damage, grasp it by its narrower sides as shown below.

Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following image for proper handling.



Ref #: TNP41441

Figure 23. Removing the Heat Sink from its Packaging

- Place the heat sink bottom side up onto a flat surface.
- Remove the plastic protective film from the Thermal Interface Material (TIM).

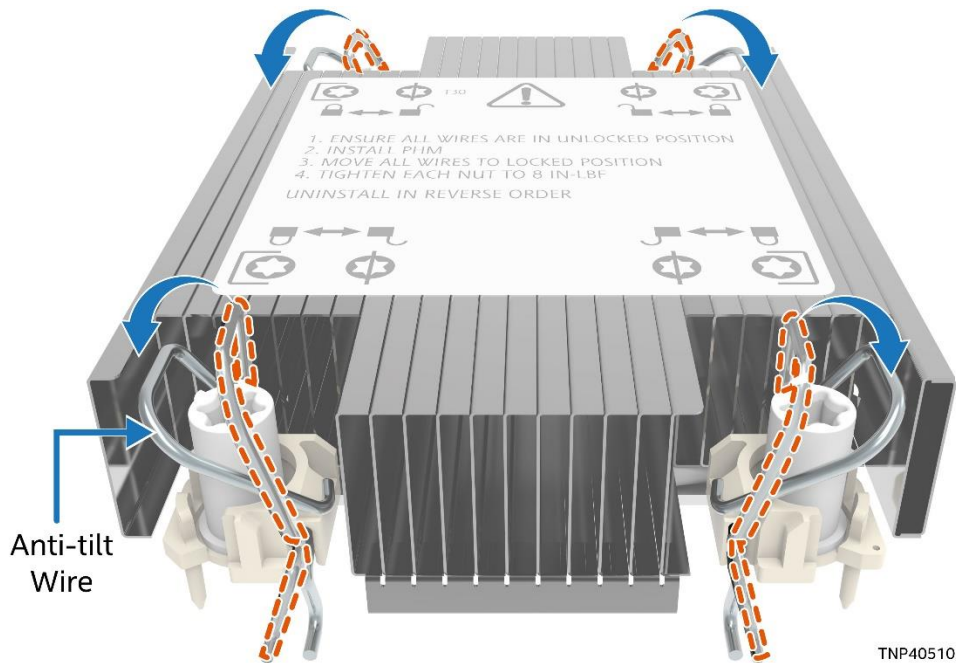


Figure 24. Processor Heat Sink Anti-tilt Wires in the Outward Position

- Set the anti-tilt wire over each of the four heat sink fasteners to their outward position.

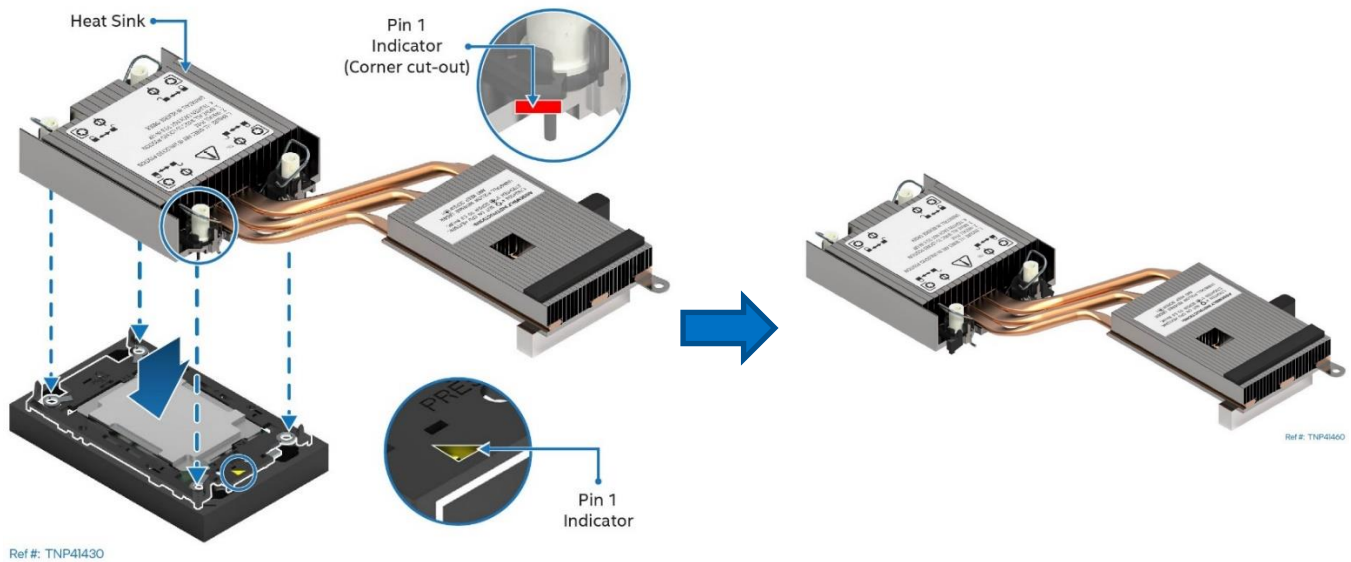


Figure 25. Pin 1 Indicator of Processor Carrier Clip

9. Align the Pin 1 indicator of processor carrier clip with one of the diagonally cut corners on the base of the heat sink. Or (if present) look for the Pin 1 indicator on the corner of the heat sink label.
10. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
11. Ensure that all four heat sink corners are securely latched to the processor carrier clip tabs.

2.3.2.2 EVAC PHM Installation

1. Remove the riser assembly on the right side of the module.

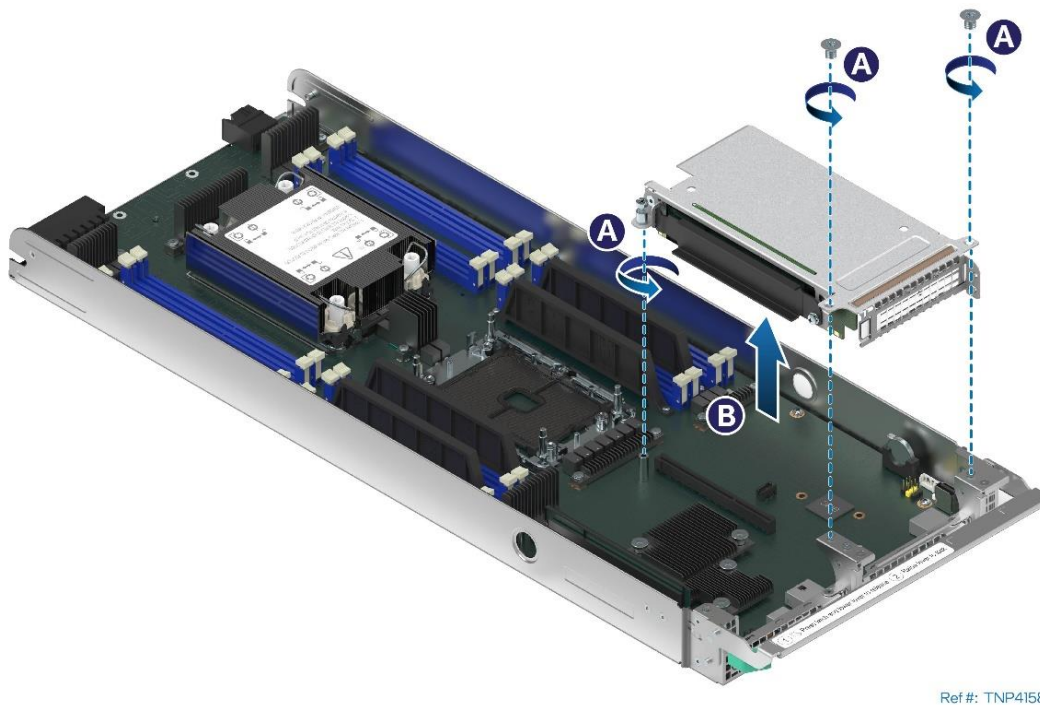


Figure 26. Removing a Riser Assembly

- Remove the three screws that secure the riser assembly to the module (see Letter A).
 - Carefully remove the riser assembly by lifting it up away from the module (see Letter B).
2. If installed, remove the plastic cover from the processor socket.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

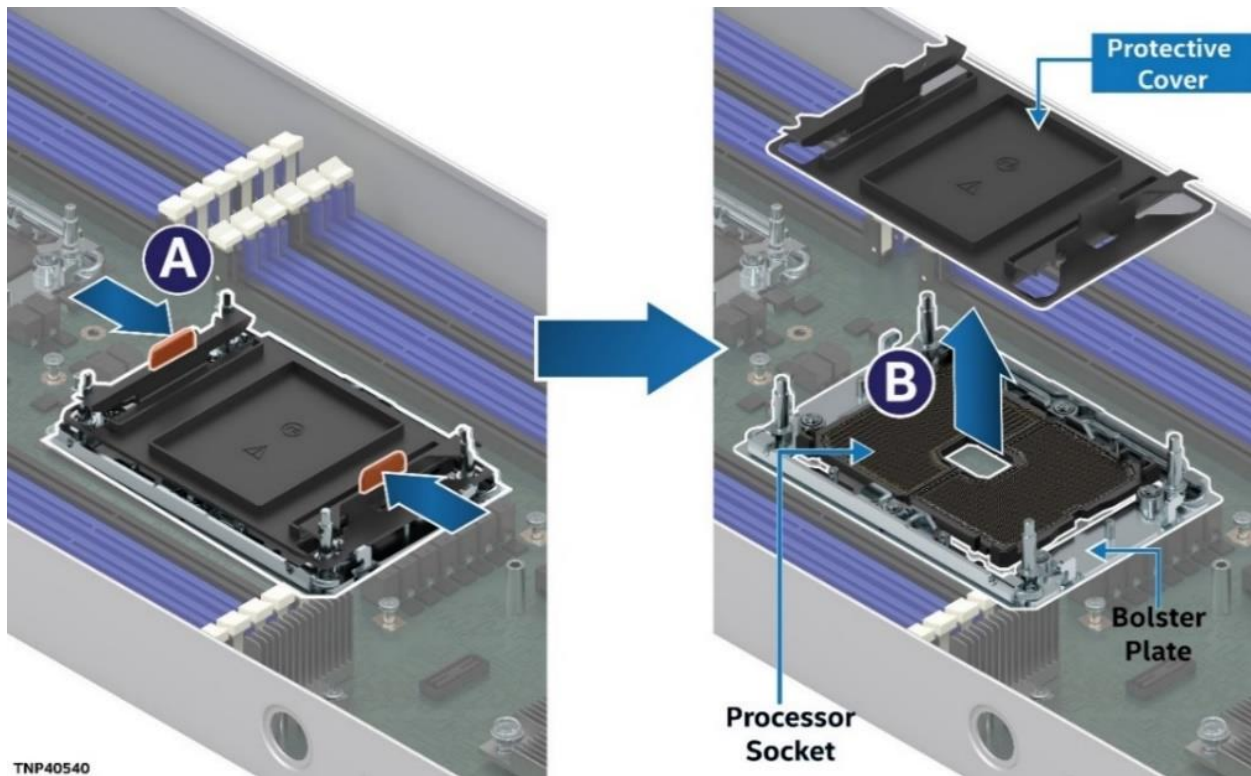


Figure 27. Socket Protective Cover Removal

- Remove the socket protective cover by squeezing the finger grips (see Letter A) and pulling the cover up (see Letter B).
- Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

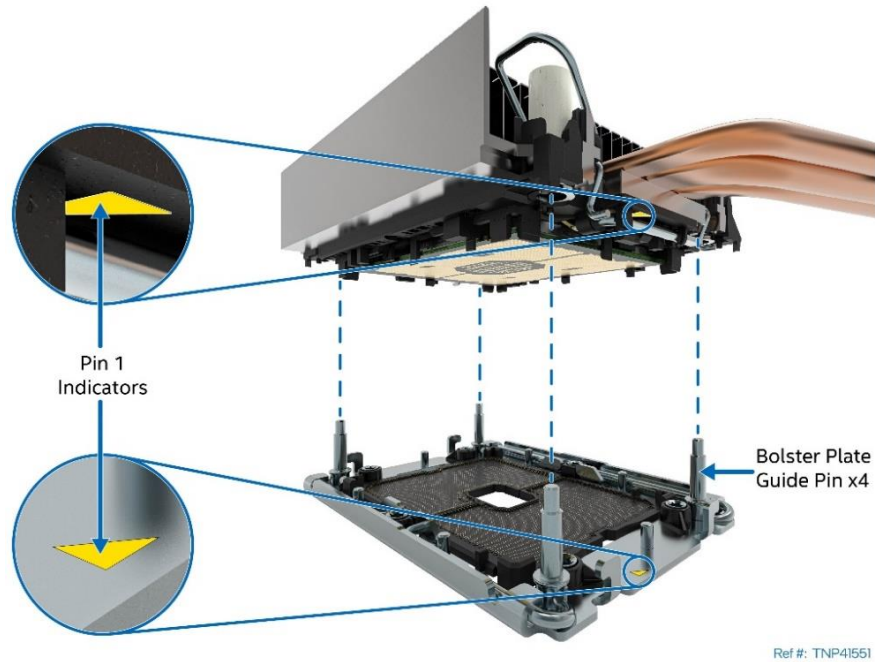


Figure 28. PHM Alignment with the Socket Assembly

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.

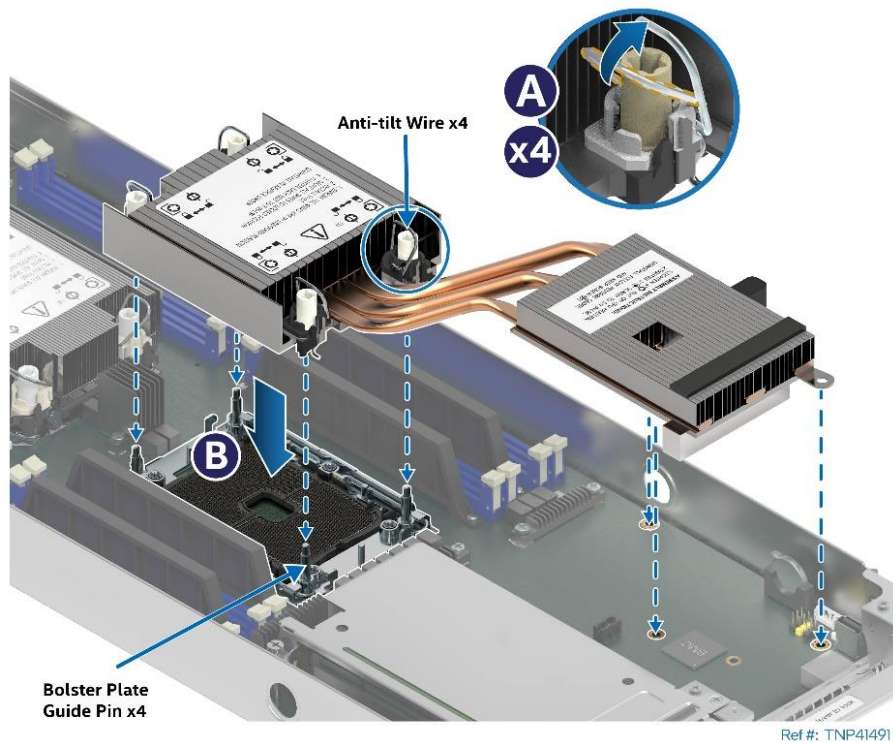


Figure 29. PHM Installation onto the Server Board

3. Set all four anti-tilt wires on the heat sink to the inward position (see Letter A).
4. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the socket assembly bolster plate.
5. Carefully lower it onto the bolster plate's alignment pins (see Letter B).

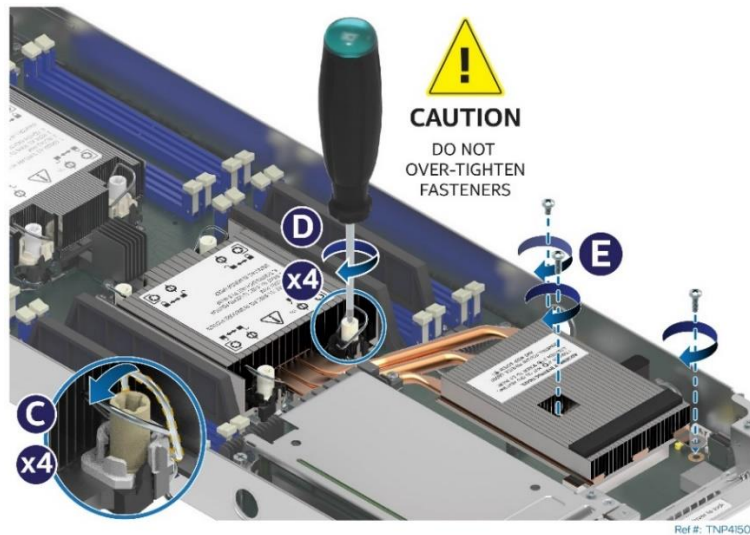


Figure 30. Tighten EVAC Heat Sink Extension

6. Ensure that the PHM is sitting flat and even on the bolster plate.
7. Set all four anti-tilt wires on the heat sink to the outward position (see Letter C).
8. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb (see Letter D). No specific sequence is needed for tightening.
9. Using a Phillips screwdriver, tighten the three heat sink extension screws to 5 in-lb (see Letter E).

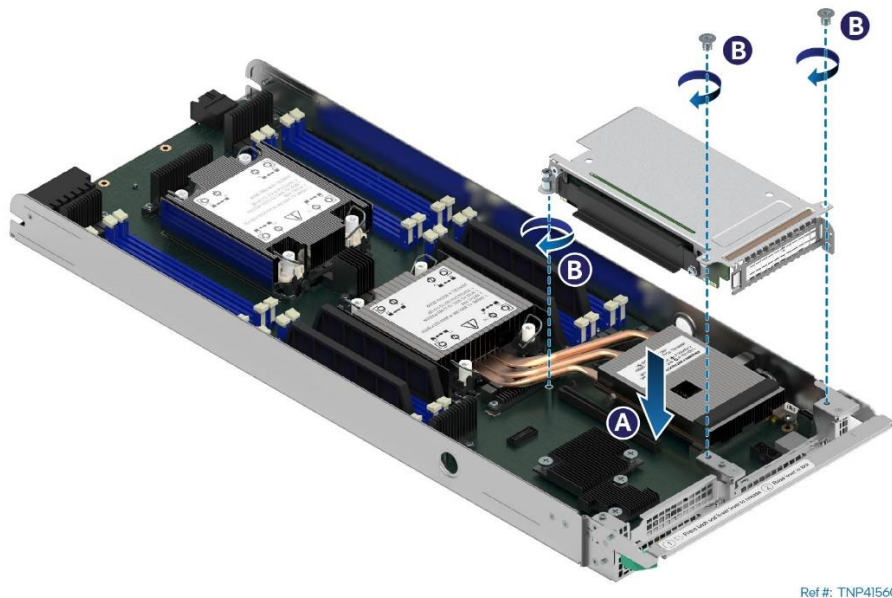


Figure 31. Installing a Riser Assembly

10. Align the riser card edge connector to the riser slot on the server board (see Letter A).
11. Carefully push down on the riser assembly until the riser card is securely seated into the riser slot.
12. Ensure that the three screw holes of the riser assembly are aligned and flush with the mounting holes of the module.
13. With three screws, secure the riser assembly to the module using 8 in-lb. of torque on each screw (see Letter B).
14. Reinstall the air duct (see [Section 2.1.2](#)).

Note: Intel requires that both processors are installed. If only one processor is installed, do not install a processor heat sink on an empty socket.

2.3.3 Assembly and Installation for Liquid-Cooled Configurations

Components Required:

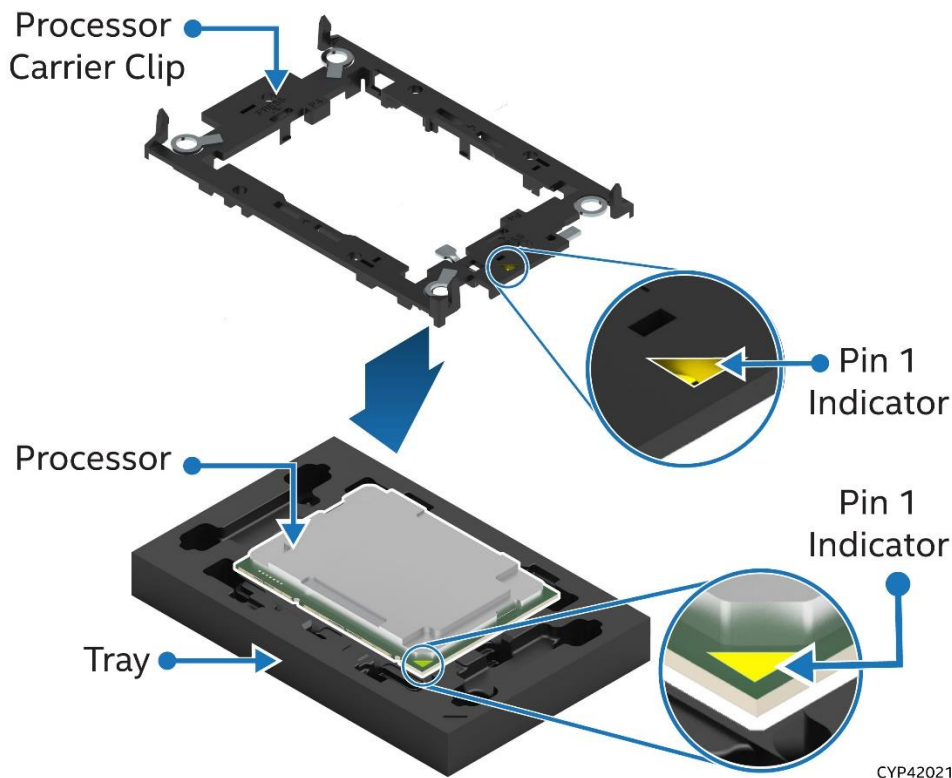
- 3rd Gen Intel® Xeon® Scalable processors
- Processor carrier clips
- Processor tray as shipped by Intel

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- T-30 Torx* screwdriver
- Phillips* head screwdriver #1
- ESD Gloves

For liquid-cooled system configurations, the processor is cooled through cold plates that are part of a liquid-cooling loop. The following steps only cover the processor and processor carrier clip installation to the socket assembly. The installation of the processor cold plates is explained in [Section 2.4](#).

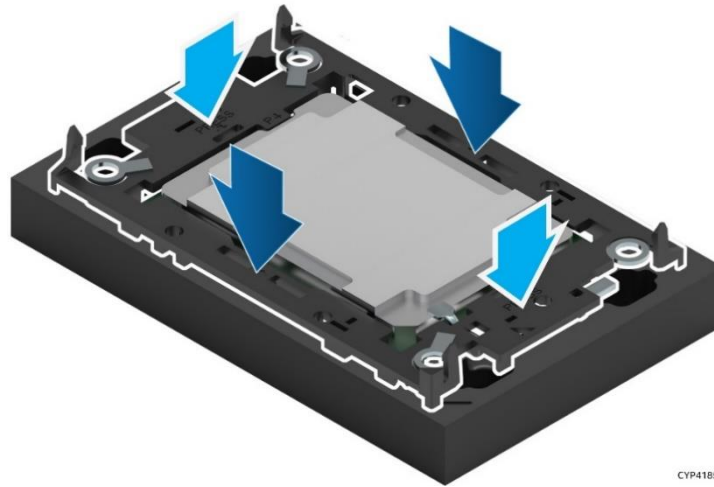
Caution: Wear ESD gloves to prevent electrostatic damage and oxidation or foreign material on processor package and land pads.



CYP42021

Figure 32. Installing Processor Carrier Clip onto Processor – Part 1

1. Place the processor carrier clip on top of the processor while it is still on the tray.
2. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.

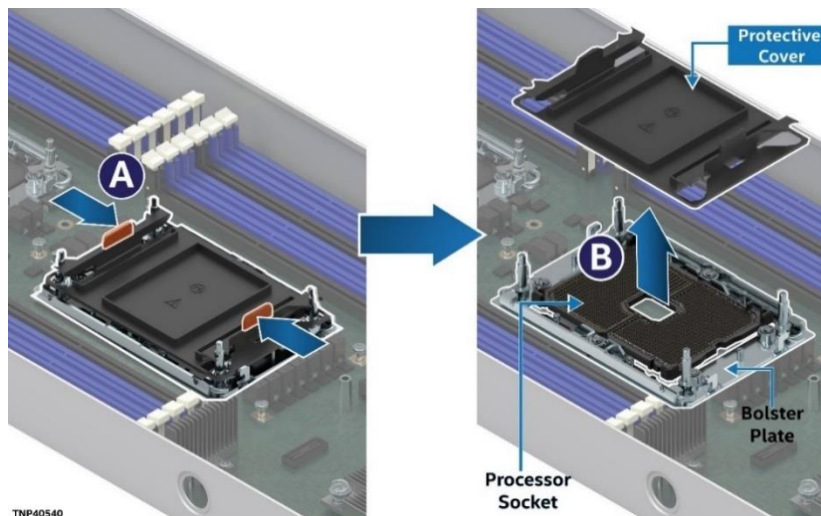


CYP41851

Figure 33. Installing Processor Carrier Clip onto Processor – Part 2

3. Gently press down on two opposite sides at a time of the processor carrier clip until it clicks.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.



TNP40540

Figure 34. Socket Protective Cover Removal

4. Remove the socket protective cover by squeezing the finger grips (see Letter A) and pulling the cover up (see Letter B).
5. Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

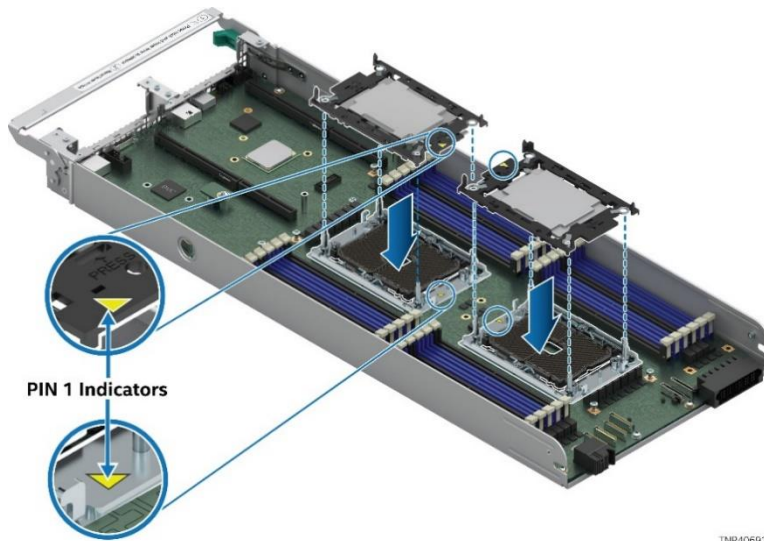


Figure 35. Align Processors and Processor Carrier Clips with Sockets

- Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the bolster plate.

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the processor and carrier clip onto the processor socket. Do not drop it.

Proceed to [Section 2.4](#) for liquid-cooling loop installation.

2.4 Liquid-Cooling Loop Installation (for Compute Module iPC D50TNP1MHCRLC)

The liquid-cooled systems are designed to operate while being connected to a non-Intel coolant distribution unit that supports Staubli* SCG 06 quick disconnect couplings. The internal cooling is done using a liquid-cooling loop. To maintain system thermals for liquid-cooled modules, the liquid-cooling loop must always be in place when the system is operational.

The installation of the liquid-cooling loop assumes that the processors and the processor clips are already installed in the sockets from [Section 2.3.2](#).

Note: Liquid Cooling loop installation requires that no DIMMs are installed in the memory slots.

Important Note: As part of the shipping process for the liquid-cooled modules, there are screws occupying the screw holes on the server board as shown on the following figure. Remove those screws **before** starting the liquid-cooling loop installation procedures described in this section.

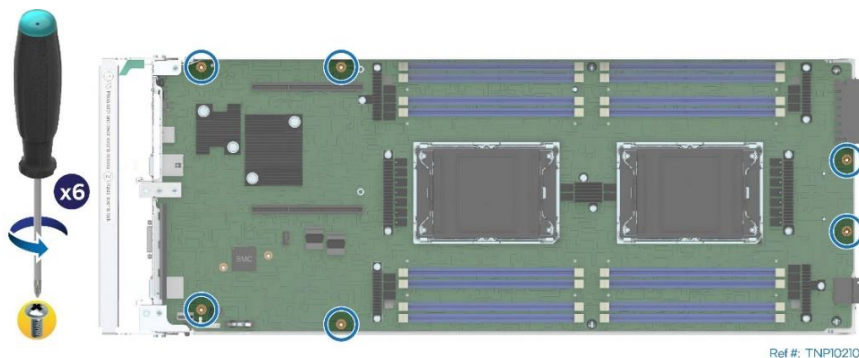


Figure 36. Screws to be Removed Before the Installation

The cooling components for liquid-cooled systems are shown in the following figure.

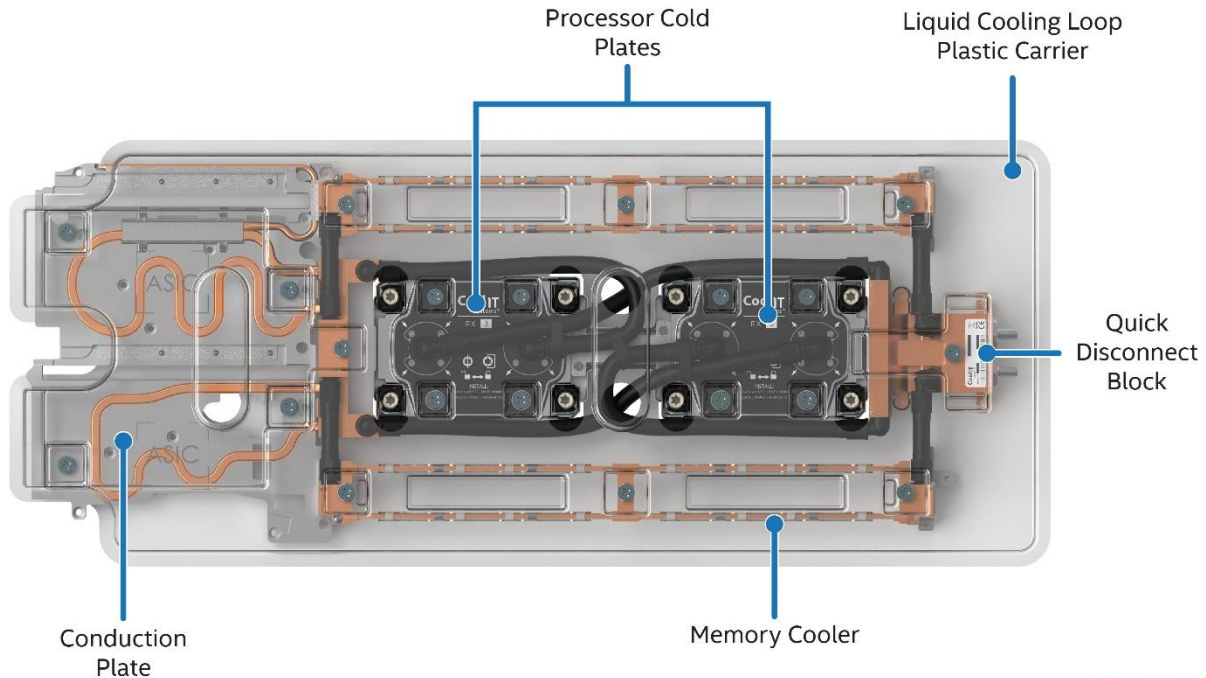


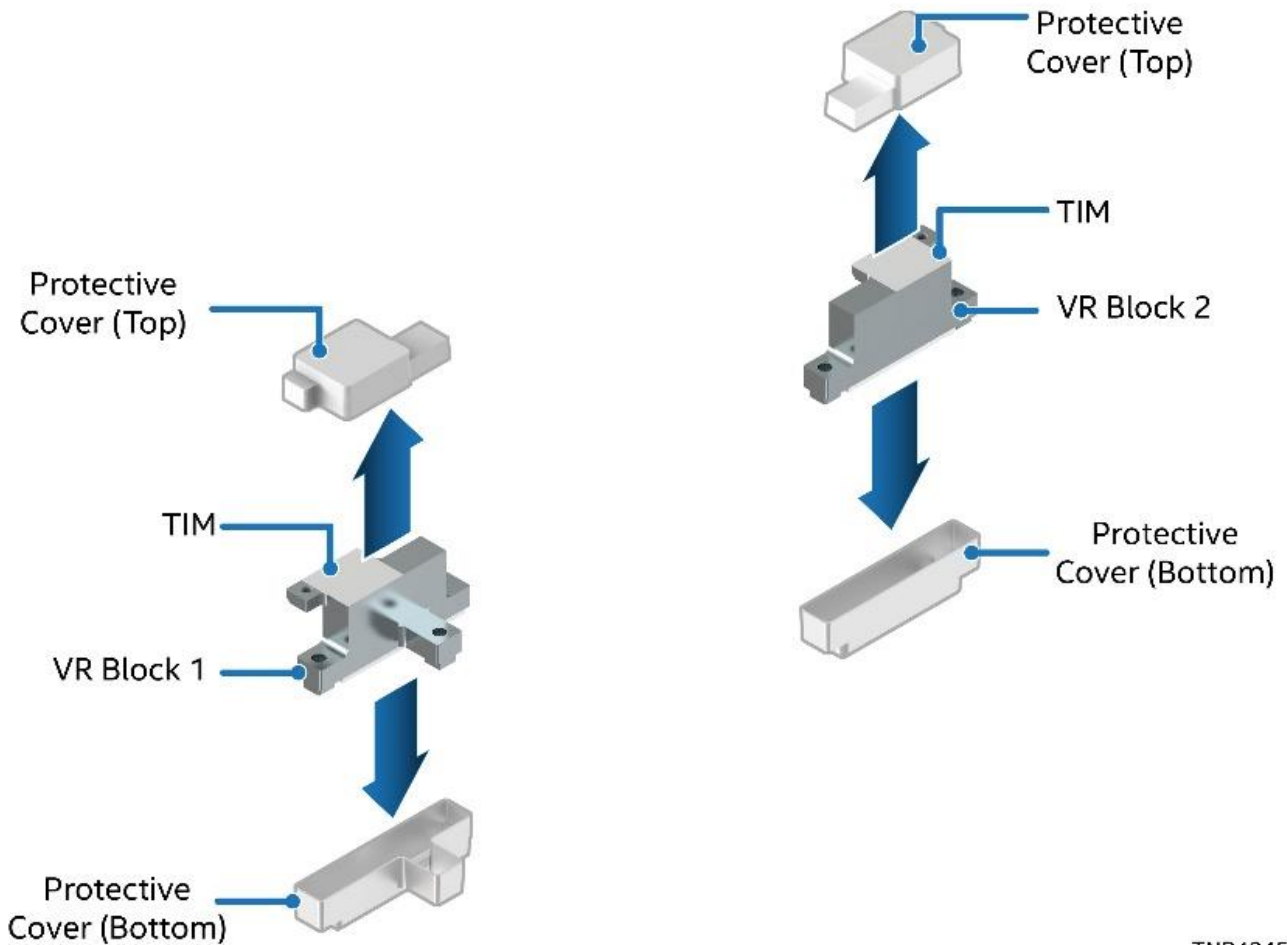
Figure 37. Liquid-Cooling Loop Components

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #2
- T-30 Torx* screwdriver
- D50TNP Liquid Cooling VR TIMM Application Tools (iPC TNPLCVRTLS)
- D50TNP Liquid Cooling VR TIMM Application Nozzles (iPC TNPLCVRTNZ)
- D50TNP Liquid Cooling VR TIMM Compound (iPC TNPLCVRCMPD)

The liquid-cooling loop package comes with two cooling blocks for the front Voltage Regulator (VR) components on the board. These cooling blocks are installed before installing the liquid-cooling loop (see the following steps).

Note: Follow the orientation of the front VR cooling blocks as shown in the following figure during the installation on the board.



TNP40450

Figure 38. Removing Front VR Cooling Block's Protective Covers

1. Carefully unpack the front Voltage Regulator (VR) cooling blocks. Remove the protective covers on both ends and ensure that the Thermal Interface Material (TIM) is in place and intact.

Note: Ensure that the TIM in the VR cooling blocks is not touched during subsequent installation steps.

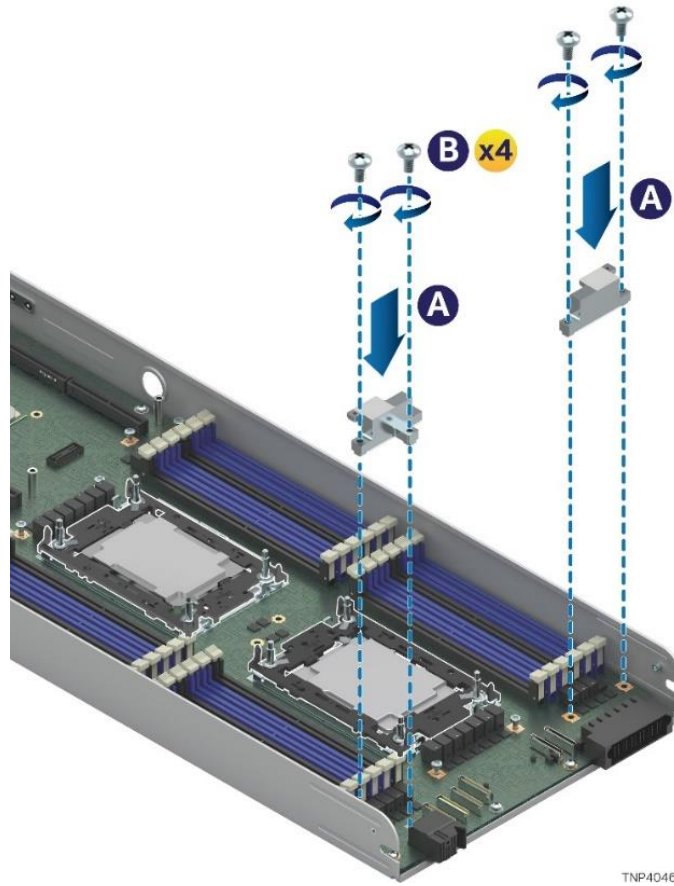


Figure 39. Installing Front VR Blocks

2. Align the front VR cooling blocks to the screw holes following the orientation shown (see Letter A).
3. Using the fastener screws, secure the front VR cooling blocks to the server board (see Letter B). Tighten to 3 in-lb.

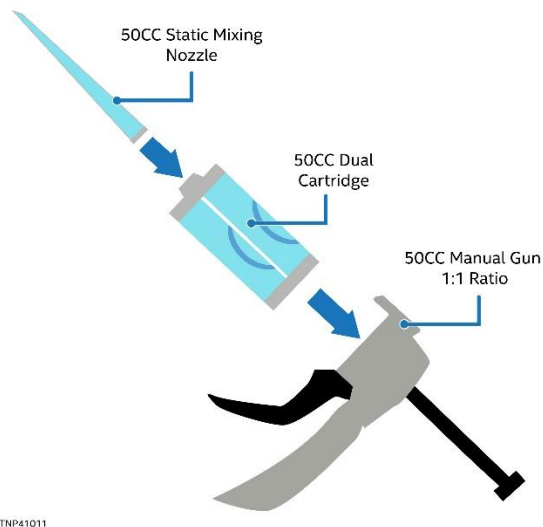
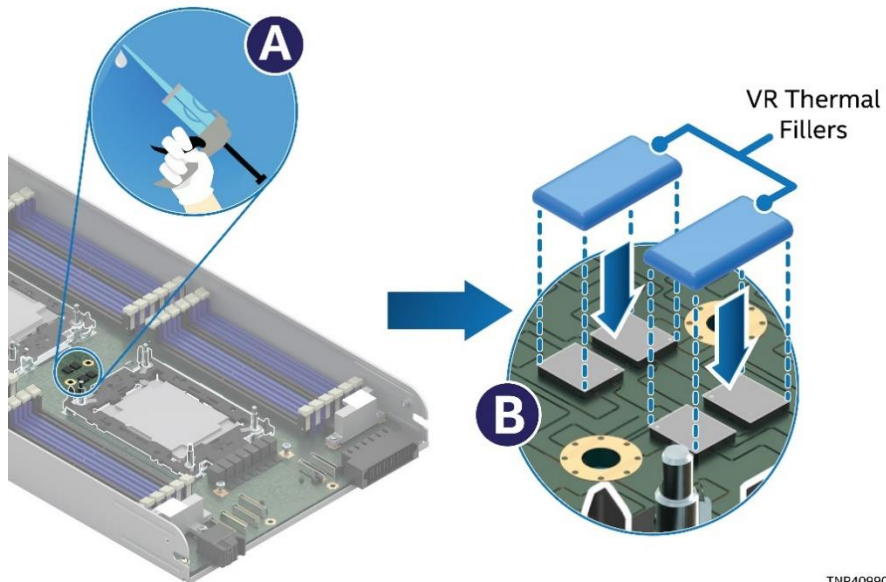


Figure 40. Assembling the Manual Applicator

4. Assemble the Bergquist SS95407 applicator, Bergquist GF3500S35 thermal gap filler cartridge, and Bergquist SS95437 nozzle as shown in the figure above.



TNP40990

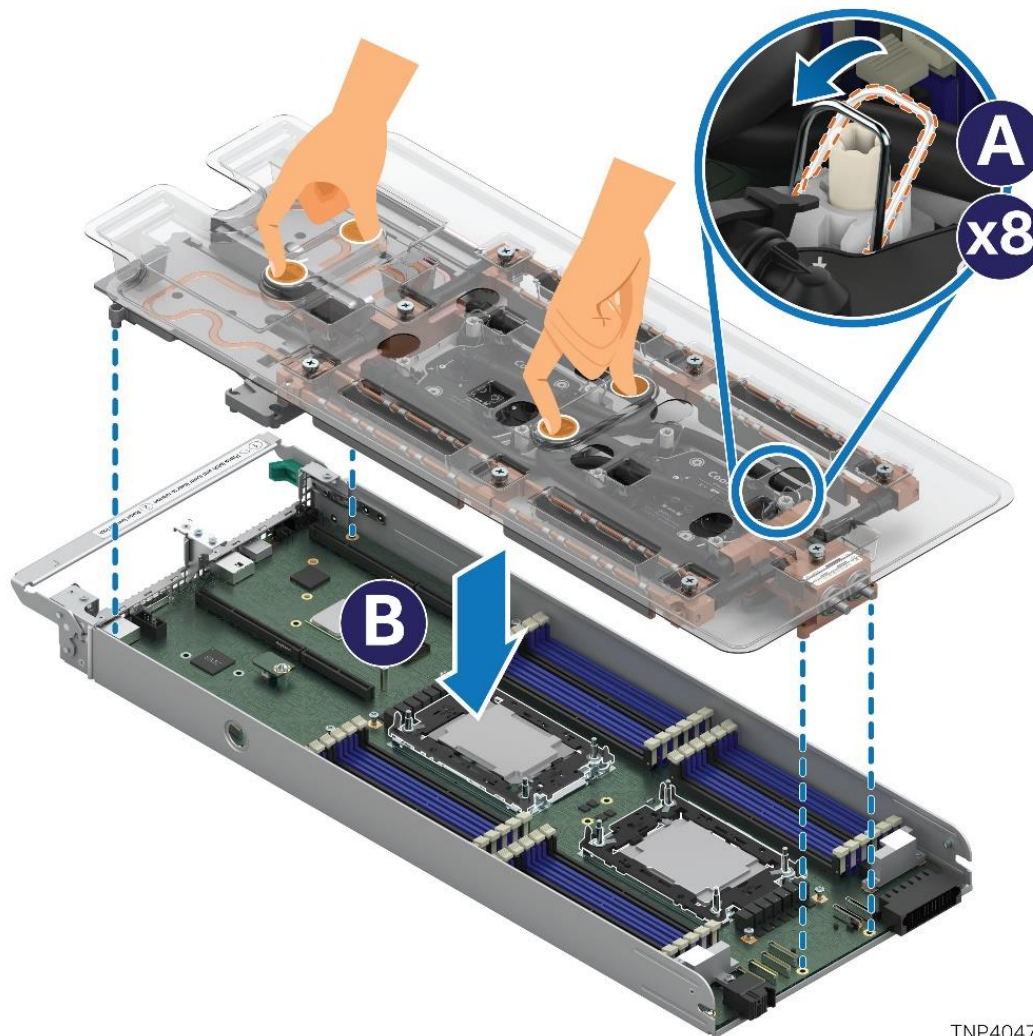
Figure 41. Applying Center VR Thermal Gap Filler

5. Using the assembled applicator (see Letter A), apply the thermal gap filler on top of the center VR components (see Letter B).

Note: Apply enough thermal gap filler (~0.3 cubic centimeters) to fully cover the VR components with a minimum thickness of 1 mm.

6. Carefully unpack the liquid-cooling loop.
7. Remove the protective covers on the PCIe* add-in card cold plate, CPU 0 and CPU 1 cold plates, and front VR cold plate.
8. Ensure that the Thermal Interface Material (TIM) for each cold plate is in place and the plastic protective film is removed.

Important Note: The liquid-cooling loop comes with a plastic carrier attached from the factory. The carrier is used during the installation and removal of the liquid-cooling loop in the module. After the liquid-cooling loop is installed in the module, the plastic carrier needs to be removed from it. Keep the plastic carrier for the liquid cooling loop removal, if needed in the future.

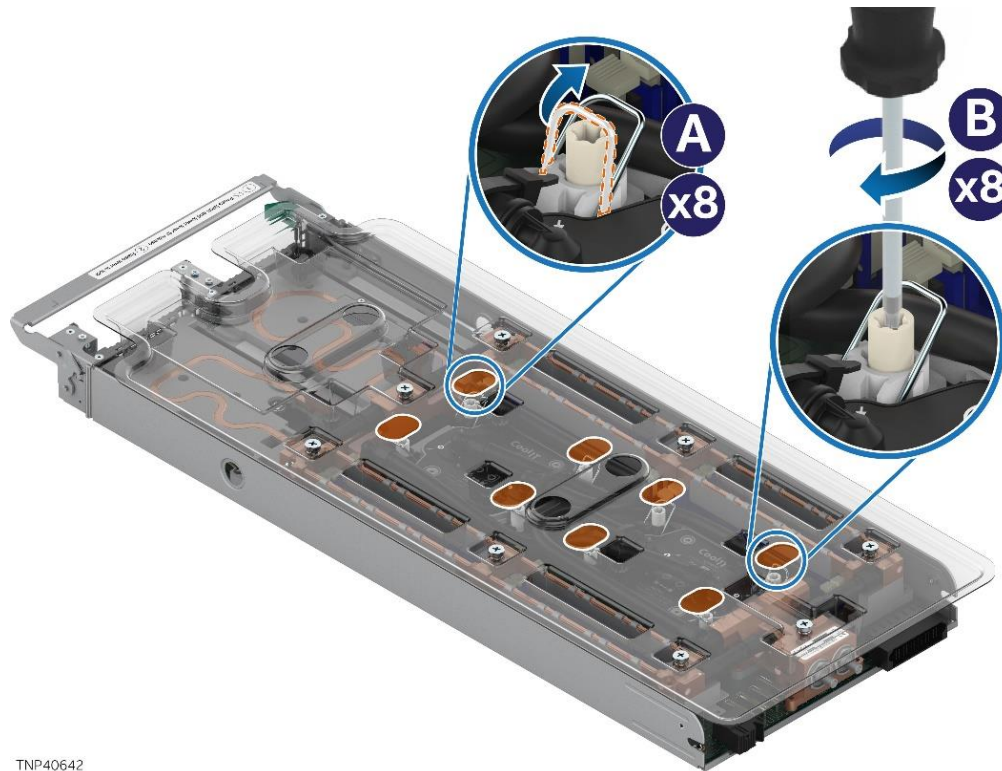


TNP40472

Figure 42. Installing Liquid-Cooling Loop

9. Set all eight anti-tilt wires in the liquid cooling loop to the inward position (see Letter A).
10. With your fingers, hold the liquid-cooling loop and carefully place it into the module (see Letter B), ensuring that processor cold plates are properly aligned with the bolster plate's alignment pins.

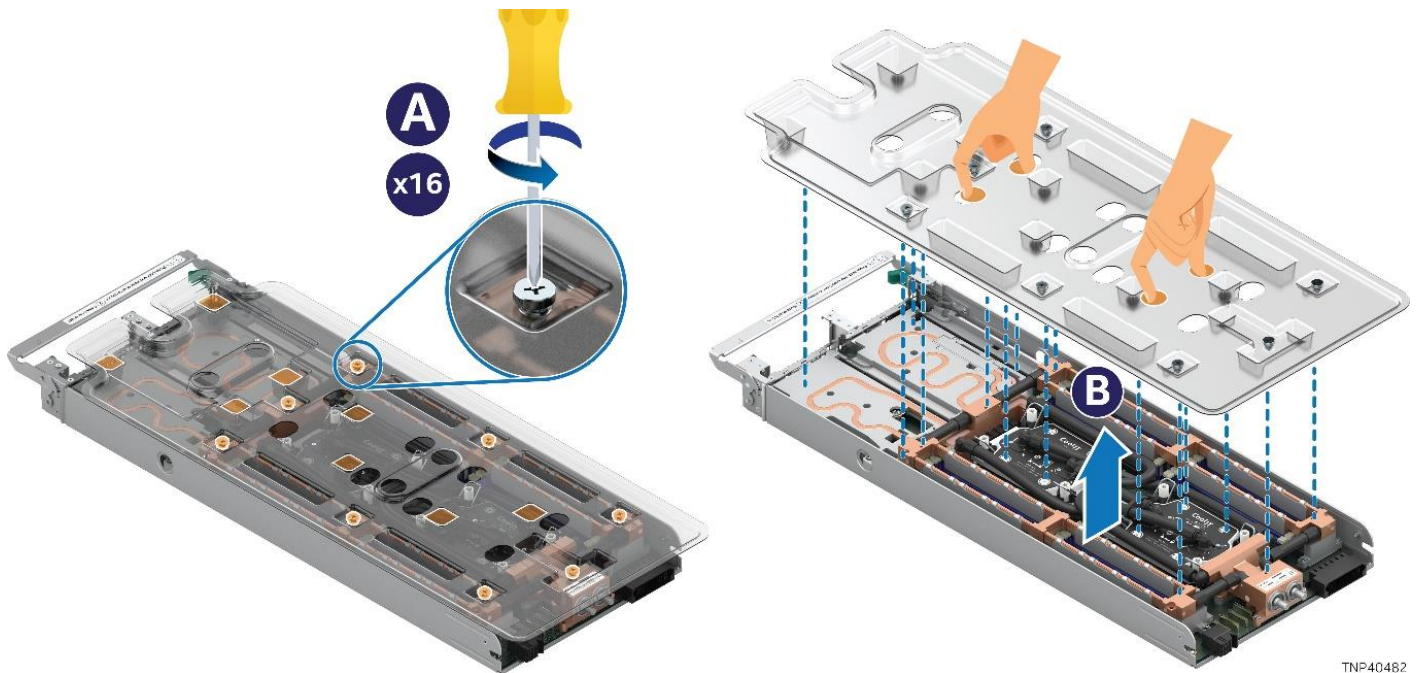
Important Note: Make sure the screw holes for the cooling-loop on the board do not have screws in place.



TNP40642

Figure 43. Securing the Processor Cold Plates

11. Set all eight anti-tilt wires in the liquid cooling loop to the outward position (see Letter A).
12. Using a T30 Torx* screwdriver, tighten the cold plate fasteners to 8 in-lb. (see Letter B). No specific sequence is needed for tightening.



TNP40482

Figure 44. Removing Liquid-Cooling Loop Carrier

13. Unscrew all 16 captive screws on the plastic carrier (see Letter A) and carefully lift the carrier up and away from the module (see Letter B).

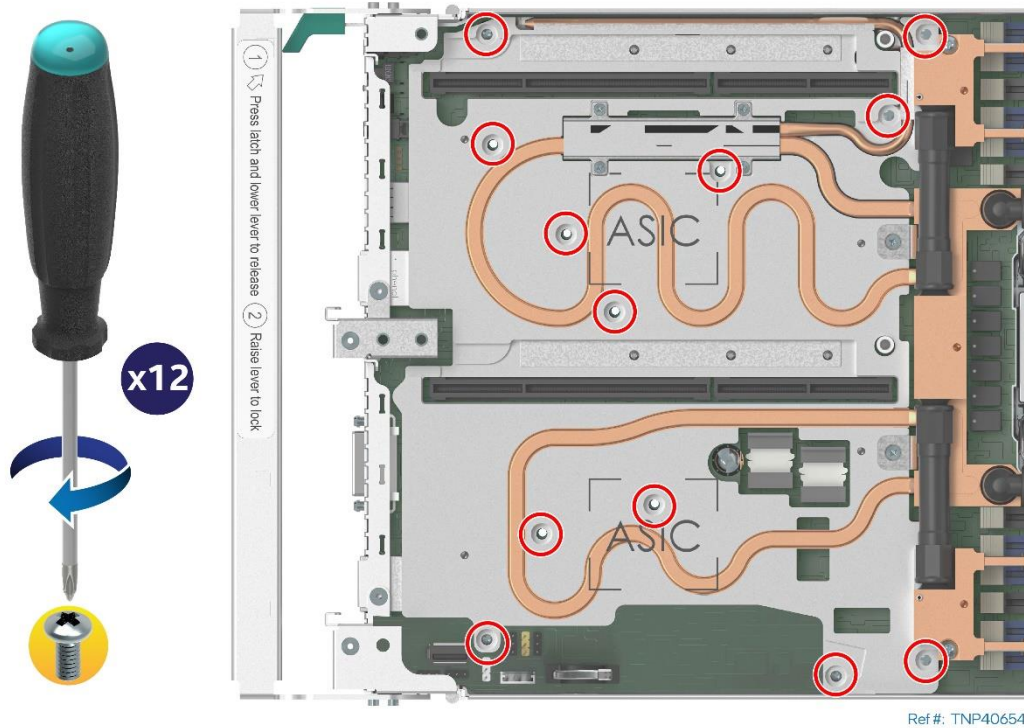


Figure 45. Securing Conduction Plate

14. Using the fastener screws, secure the conduction plate to the server board. Tighten to 3 in-lb.

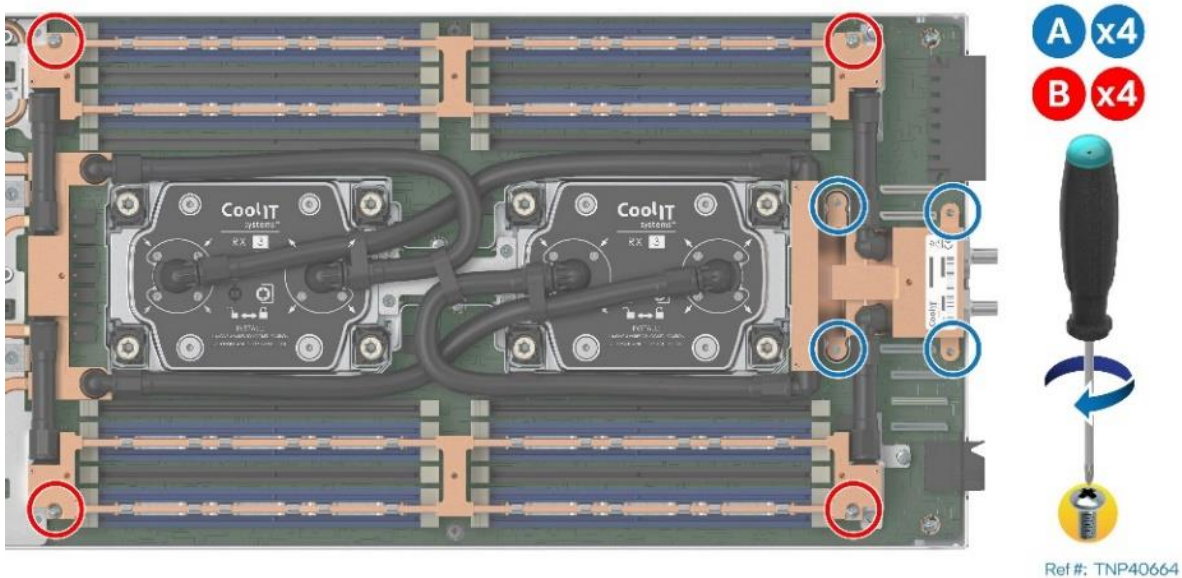


Figure 46. Securing the Quick Disconnect Block and Memory Cooler

15. Using four fastener screws (see Letter A), secure the quick disconnect block to the server board. Tighten to 3 in-lb.

16. Using four fastener screws (see Letter B), secure the memory cooler to the server board. Start threading but **do not tighten** until the memory DIMMs are installed.

2.5 Memory Module Installation

The memory module installation procedure for a liquid-cooled module and an air-cooled module is different. Refer to the appropriate sub-section for your specific module configuration.

The Intel® Server Boards D50TNP1SB and D50TNP1SBCR support standard DDR4, RDIMMs, and LRDIMMs. In addition, the Intel® Server Board D50TNP1SB supports Intel® Optane™ persistent memory 200 series modules (also known as, Intel® Optane™ PMem).

DDR4 DIMM and Intel® Optane™ PMem are commonly referred to as “memory module” in the following instructions.

Note: The system requires that all memory slots be populated with either a memory module or a DIMM blank. Preinstalled DIMM blanks should only be removed when replacing it with an actual memory module. When removing a memory module from the system, it must be replaced with an equivalent device or a DIMM blank.

Note: See [Appendix B](#) for general memory population rules.

2.5.1 Memory Module Installation for Air-Cooled Modules

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

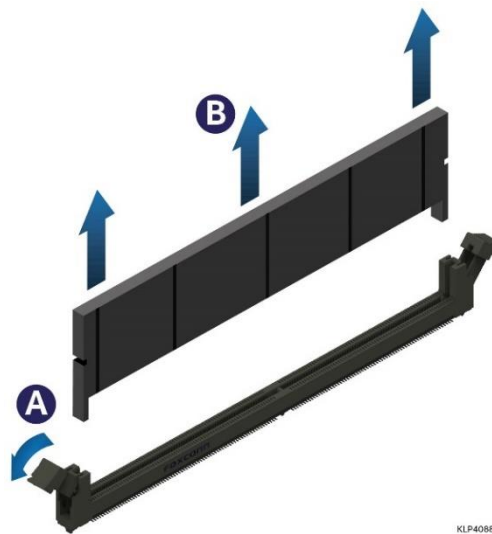
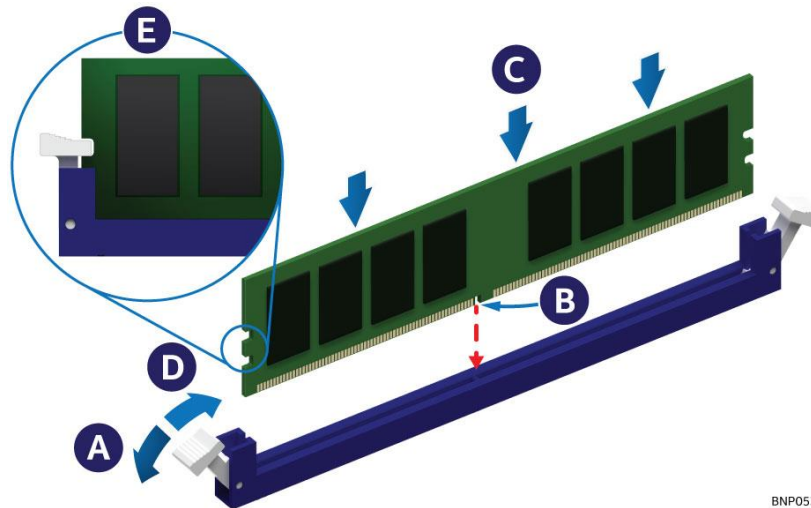


Figure 47. DIMM Blank Removal

1. Remove the DIMM blank from the desired memory slot
 - Open the ejection tabs at both ends of the selected memory slot to lift the DIMM blank from the slot (see Letter A).
 - Carefully remove the DIMM Blank from the system (see Letter B).



BNP053

Figure 48. Memory Module Installation

2. Ensure that the ejector tabs at both ends of the memory slot are pushed outward to the open position (see Letter A).
3. Carefully remove the memory module from its packaging, taking care to only handle it by its outer edges.
4. Align the notch at the bottom edge of the memory module with the key in the memory slot (see Letter B).
5. Insert the memory module into the memory slot
 - Using even pressure along the top edge, push down on the memory module (See letter C) until the ejector tabs of the memory slot snap into place (see Letter D).
6. Ensure that the ejector tabs are firmly in place (see Letter E).

Note: Intel® Optane™ PMem devices require additional steps to enable and configure them. Refer to the appropriate Intel® Optane™ PMem documentation to complete the installation process.

2.5.2 DDR4 DIMM Installation for liquid-Cooled Modules

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #2
- Memory replacement tool and retention clip (see [Figure 50](#))

The liquid-cooled modules only support standard DDR4 DIMMs. Intel® Optane™ PMem modules are not supported. Before installing the standard DDR4 DIMMs, ensure that the liquid-cooling loop is already installed in the modules and the memory cooler mounting screws are loosened (see following figure).

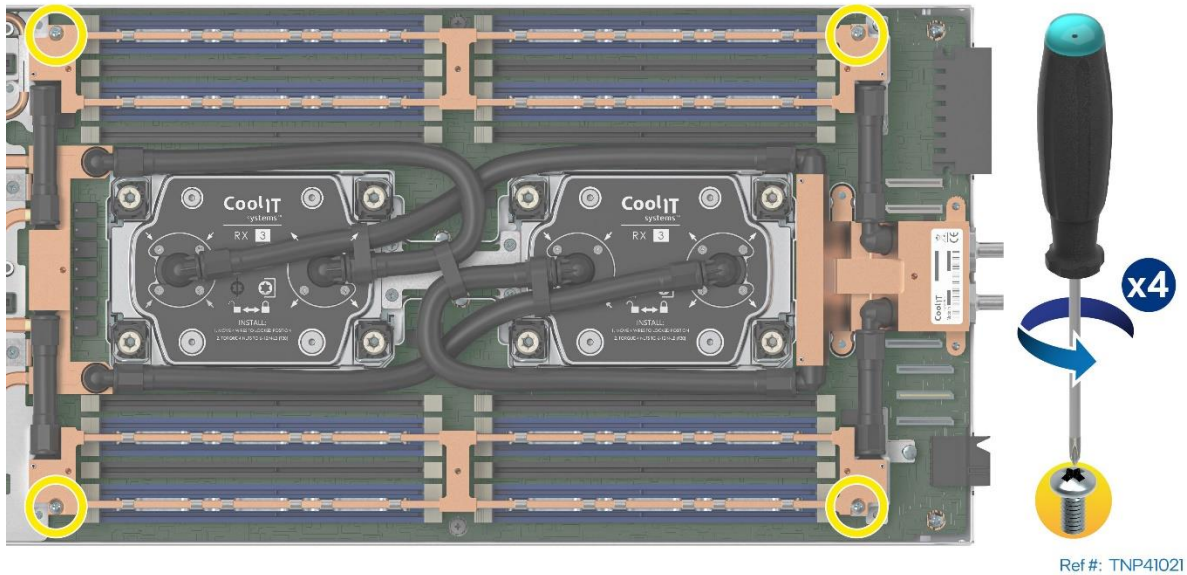
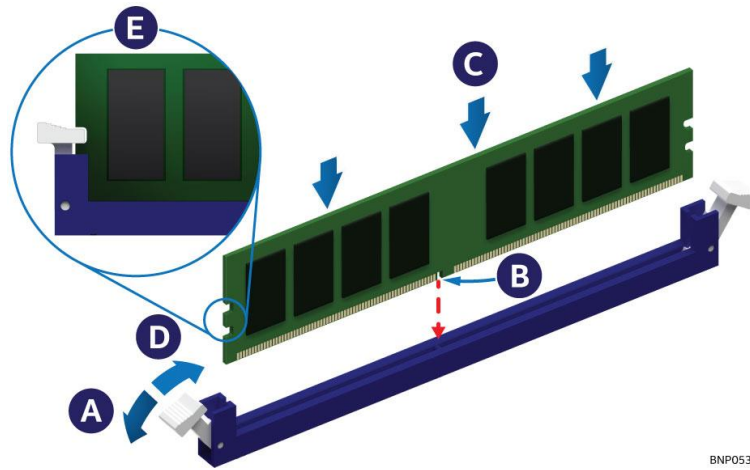


Figure 49. Loosen Memory Cooler Screws



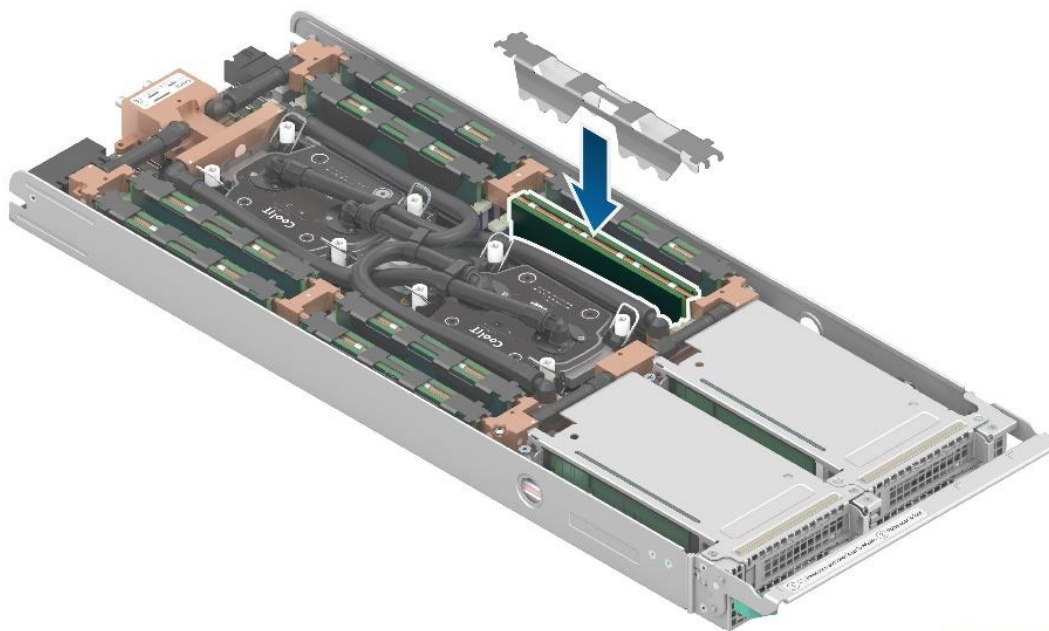
Figure 50. Memory Replacement Tools and Retention Clip



BNP053

Figure 51. Installing the DDR4 DIMM in a Liquid-Cooled System

1. Locate the memory slot for installation.
2. Ensure that the ejector tabs at both ends of the memory slot are pushed outward to the open position (see Letter A). Use the memory replacement tool if the memory ejector tabs are in the closed position.
3. Carefully remove the memory module from its packaging, taking care to only handle it by its outer edges.
4. Align the notch at the bottom edge of the memory module with the key in the memory slot (see Letter B).
5. Insert the memory module into the memory slot
 - Using even pressure along the top edge, push down on the memory module (see Letter C) until the ejector tabs snap into place (see Letter D).
6. Ensure that the ejector tabs are firmly in place (see Letter E).



Ref #: TNP40702

Figure 52. Installing the DDR4 DIMM Retention Clips

7. Install all the DDR4 DIMM retention clips over the select DDR4 DIMM pair as shown.
8. Ensure that the clip is securely in place.

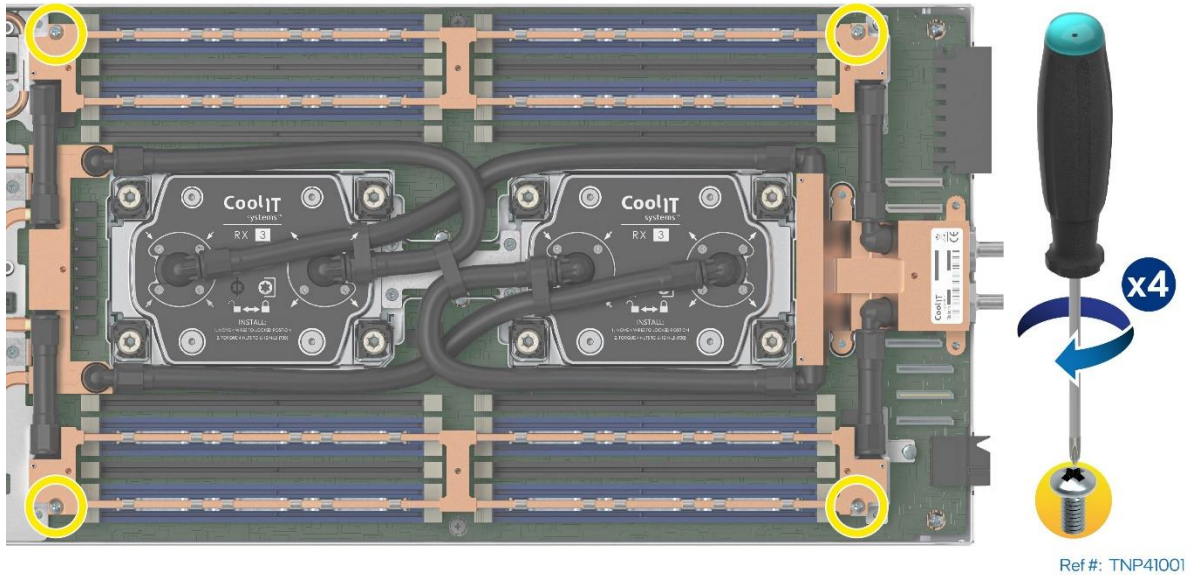


Figure 53. Securing the Memory Cooler to the Server Board

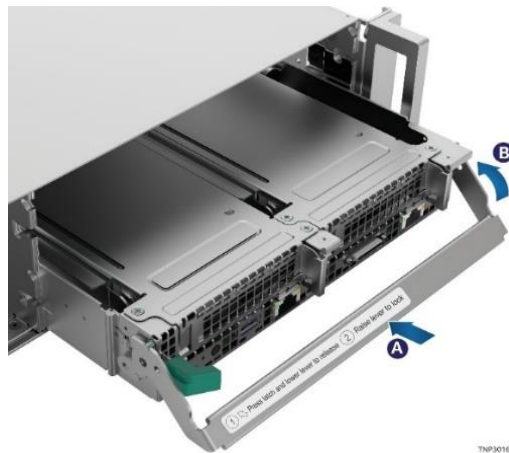
9. Tighten the fastener screws in the liquid-cooling loop to secure the memory cooler to the server board.

2.6 Module Installation

For installation procedures associated with all other system options and accessories, refer to the System Options/Accessory Kit Installation section. If no other installations are required, the module must be installed in the chassis using the following steps.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)



1U module shown

Figure 54. Installing a Module

1. Ensure that the lever in front of the module is lowered. If not, press the green latch inward and lower the lever (see Letter A).
2. Align the module to its corresponding bay and push it into the chassis until the key pins in the lever are inside the chassis inner wall key hole.
3. Raise the lever to secure the module (see Letter B).

2.6.1 Storage Module Installation (iPC D50TNP2MHSTAC Only)

Important: When installing an Intel® Storage Module in the chassis for the very first time, the internal chassis rails need to be removed.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

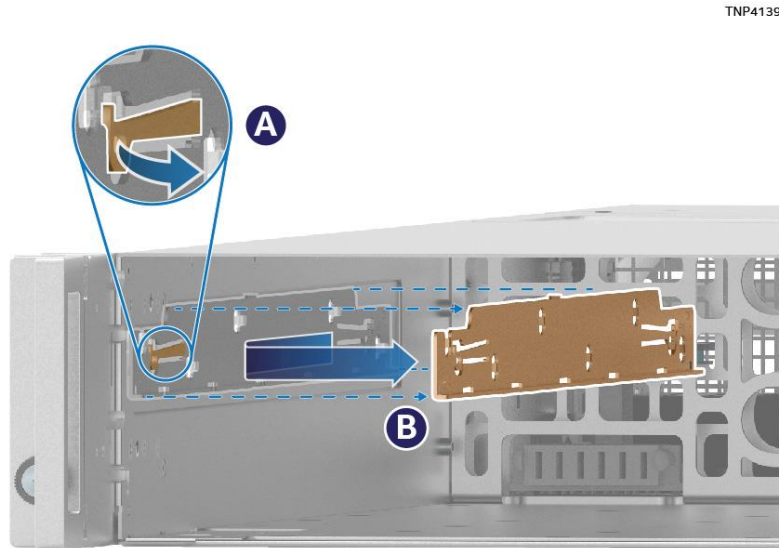


Figure 55. Removing the Internal Chassis Rail

1. Locate the internal rails in the upper part of the inner wall, both sides of the chassis.
2. Release the rail latch (see Letter A).
3. Slide the rail towards the front of the chassis to remove it (see Letter B).

Do not reinstall the internal chassis rails if the chassis is used only for Intel® Storage Module. For any other type of module installation, the internal chassis rails need to be reinstalled. Follow the instructions below to reinstall the internal chassis rails.

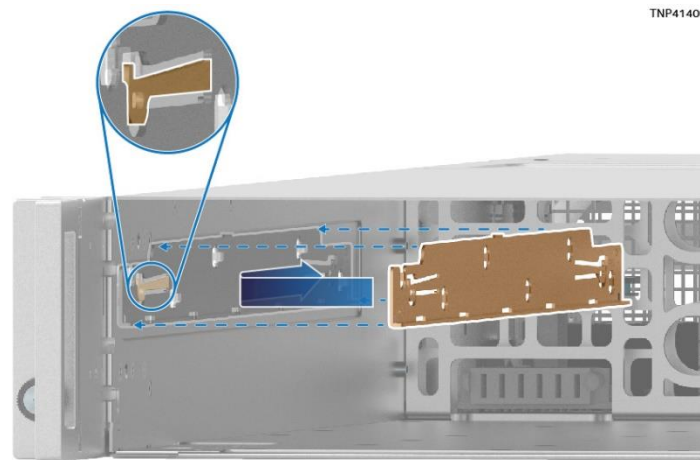


Figure 56. Installing the Internal Chassis Rail

4. Place the new rail inside the chassis, aligning the keying pins of the rail with the chassis inner wall.
5. Slide the rail into the chassis inner wall towards the back of the chassis until it locks into place.

3. System Options / Accessory Kit Installation

This chapter provides instructions for the integration of system options and other Intel accessories. If your integrated Intel server did not come preinstalled with processors or memory, installation procedures for these components are in [Chapter 2](#).

Before You Begin

Before integration of any system components, review all safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

System Reference

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the chassis and front of a module.



Front

WKP2091

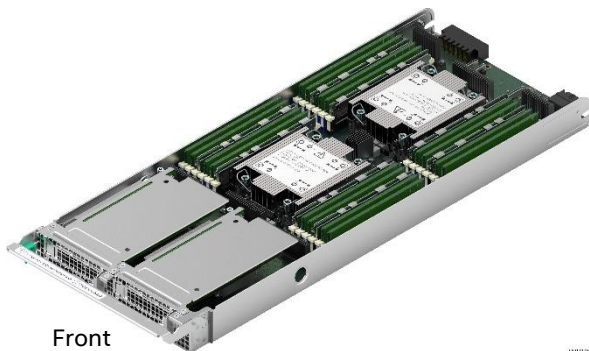


Front

TNP3131

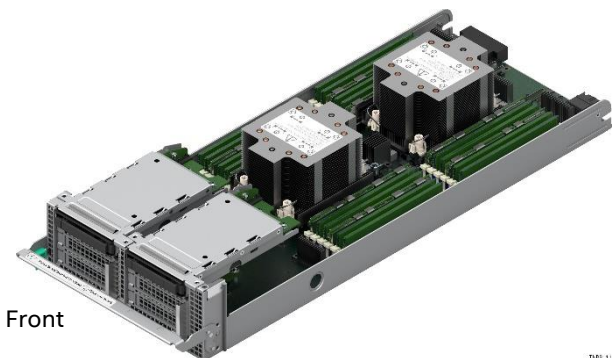
Server Chassis

1U Liquid-Cooled Compute Module



Front

TNP3131



Front

TNP3131

1U Air-Cooled Compute Module

2U Air-Cooled Management Module

Figure 57. System Directional Reference

Instruction Format

Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.

3.1 Installing the Chassis Into a Rack

The chassis installation into a rack can be performed at any time throughout this chapter while the modules are being integrated with system options and accessories.

Before following the instructions in this section, remove all modules from the server chassis (see [Section 3.2.1](#)). If the rail kit is already installed, proceed to [Section 3.1.2](#).

3.1.1 Installing the Fixed Rail Kit

The Intel® Server System D50TNP includes a fixed rail kit that serves as a shelf for the system upon installation into the rack. When a system is installed onto the fixed rails, it can be secured to both the rail and the rack via a pair of thumbscrews on the front of the server system.

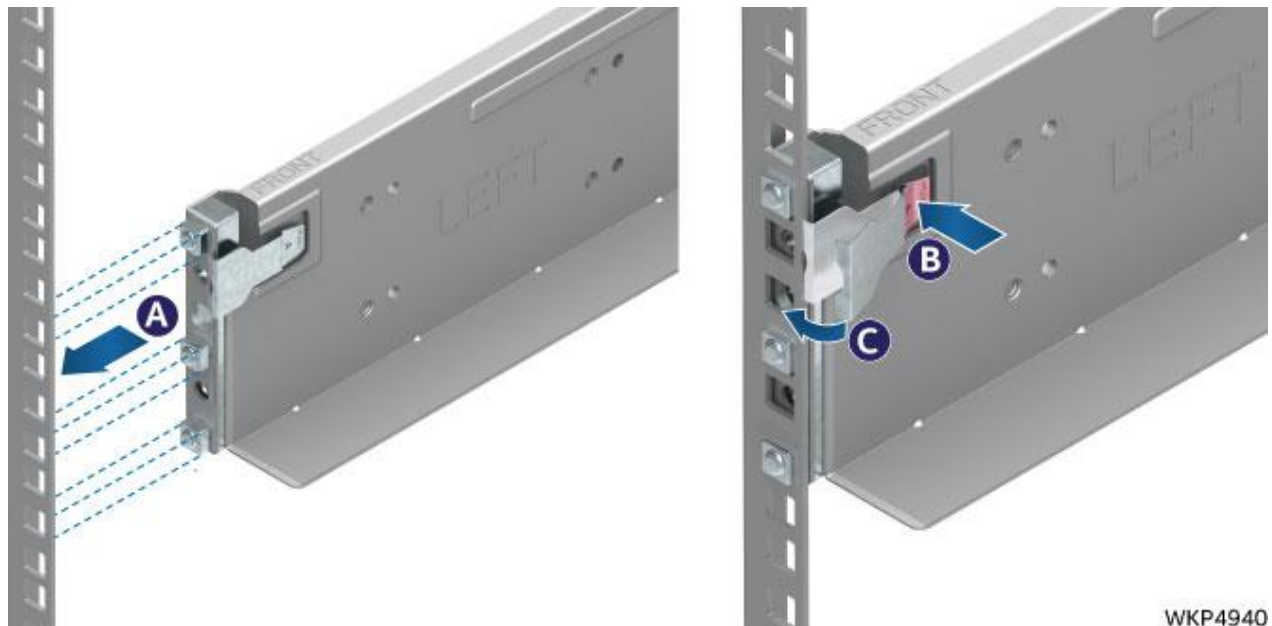


Figure 58. Securing the Front of the Rack Rail

1. Remove the chassis rail kit from the packaging.
2. Locate the rail, either left or right, and align the rail guides with the slots in the front of the rack (see Letter A).
3. Insert the rail guides into their respective rack slots while pressing the clip (see Letter B).
4. Release the clip once the guides are fully inserted into the rack (see Letter C).

WKP4950

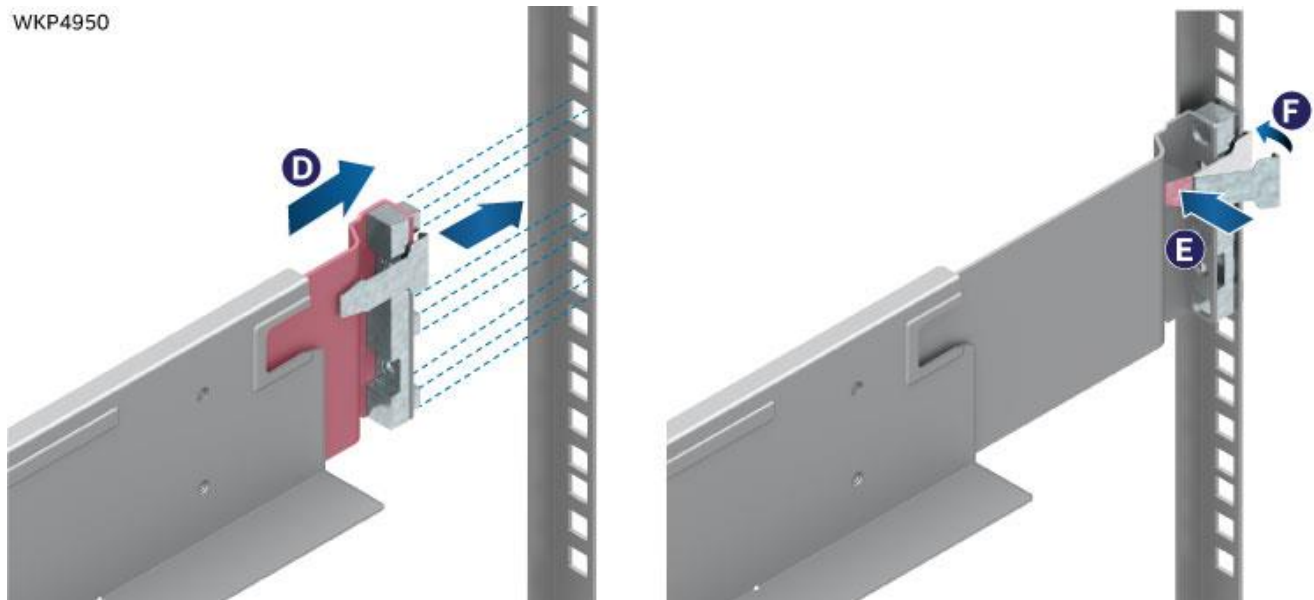


Figure 59. Securing the Back of the Rail

5. Extend and align the rear guides with their slots in the back of the rack (see Letter D).
6. Insert the rail guides into their respective rack slots while pressing the clip (see Letter E).
7. Release the clip once the guides are fully inserted into the rack (see Letter F).
8. Repeat this process with the opposite rail.

3.1.2 Installing the Chassis Into a Rack

Important Safety Note: Due to the weight of a fully configured system, Intel recommends:

- use a mechanical lift to aid with the installation of the system into the rack, and/or
- use at least two people to install the system into the rack, or
- remove all installed modules from the system before attempting to install the system into the rack

WKP2160

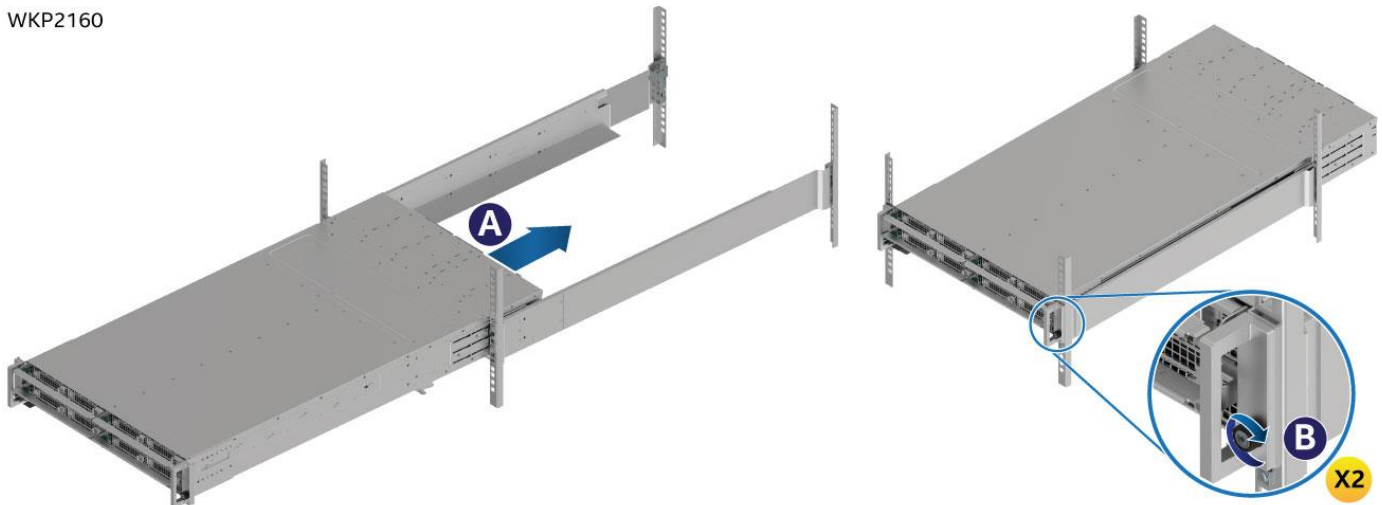


Figure 60. Installing the Chassis into the Rack

1. Insert the chassis onto the rails and slide it back to the rear of the rack (see Letter A).
2. Tighten the thumbscrews on the chassis handles to secure the chassis to the rack (see Letter B).
3. If modules were removed, install them into the chassis (see [Section 3.2.2](#)).

3.2 Module Removal / Installation

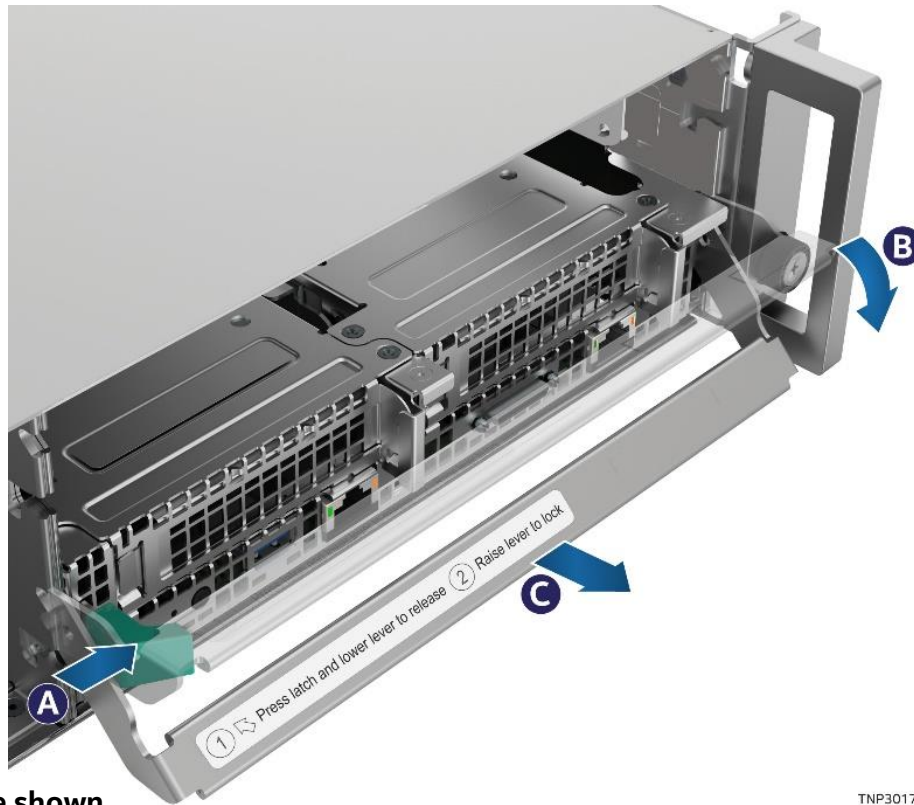
If the module is installed inside the chassis, remove the module via the following steps. Otherwise, proceed to the next section.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

3.2.1 Module Removal

1. Power down the module using the power button  on the front panel of the module to be integrated.



1U module shown

TNP30170

Figure 61. Removing a Module

2. Press the green latch inward (see Letter A) and lower the lever in front of the module (see Letter B).
3. Grasp the lever and pull out the module from the chassis (see Letter C).

Note: To keep the system operating within its thermal limits, module bays must be populated with either a module or blank when any of the installed modules are operational.

3.2.2 Module Installation

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

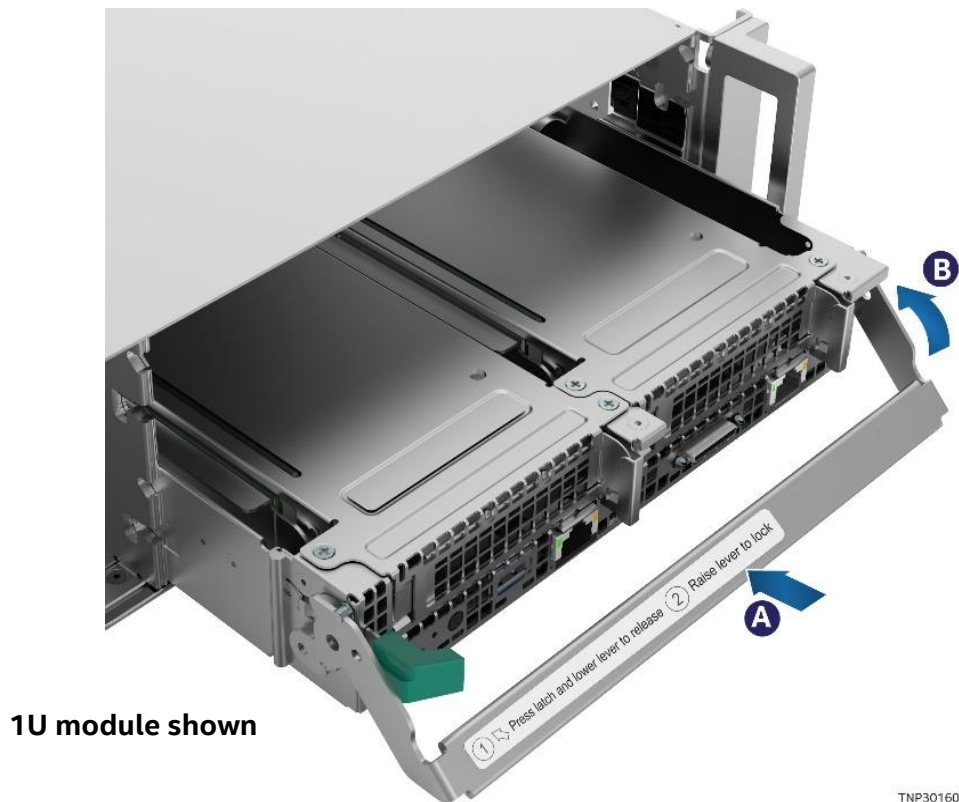


Figure 62. Installing a Module

1. Ensure that the lever in front of the module is lowered. If not, press the green latch inward and lower the lever (see Letter A).
2. Align the module to its corresponding bay and push it into the chassis until the key pins in the lever are inside the chassis inner wall key hole.
3. Raise the lever to secure the module (see Letter B).

3.2.2.1 Storage Module Installation (iPC D50TNP2MHSTAC Only)

Important: When installing an Intel® Storage Module in the chassis for the very first time, the internal chassis rails need to be removed.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

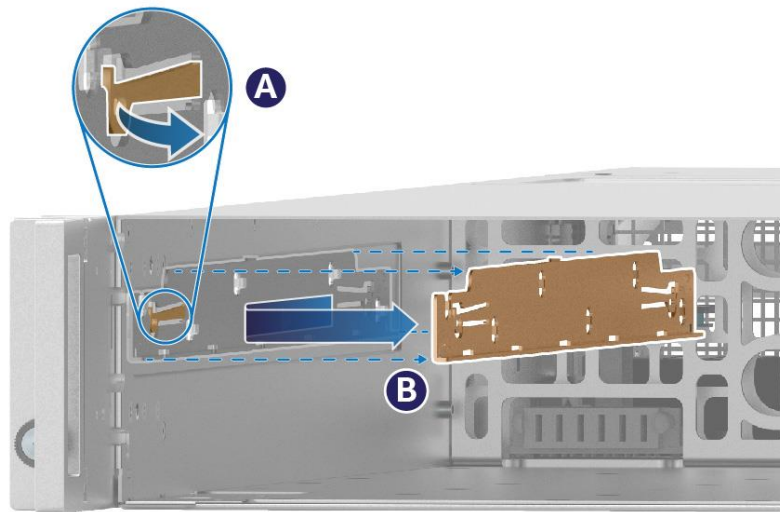


Figure 63. Removing the Internal Chassis Rail

1. Locate the internal rails in the upper part of the inner wall, both sides of the chassis.
2. Release the rail latch (see Letter A).
3. Slide the rail towards the front of the chassis to remove it (see Letter B).

Do not reinstall the internal chassis rails if the chassis is used only for Intel® Storage Module. For any other type of module installation, the internal chassis rails need to be reinstalled. Follow the instructions below to reinstall the internal chassis rails.

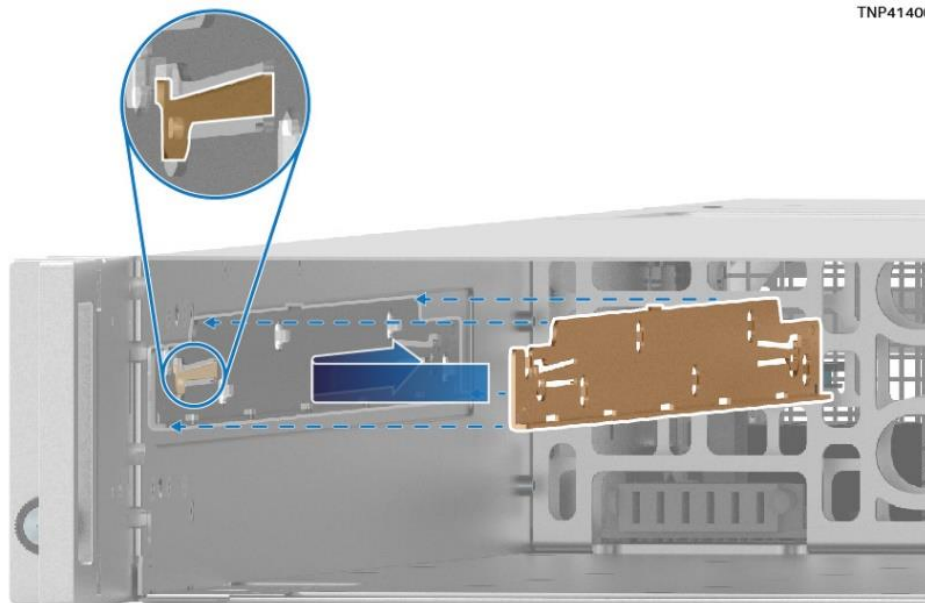


Figure 64. Installing the Internal Chassis Rail

4. Place the new rail inside the chassis, aligning the keying pins of the rail with the chassis inner wall.
5. Slide the rail into the chassis inner wall towards the back of the chassis until it locks into place.

3.3 Air Duct Removal / Installation

To maintain system thermals, the air duct must always be in place when the system is operational. Removal of the air duct is necessary when installing or replacing any system component within the module.

The figures below show the air duct for D50TNP1MHCPAC. However, the steps for air duct removal and installation in this section apply to D50TNP1MHCPAC, D50TNP1MHCRCAC, D50TNP2MHSVAC, and D50TNP2MFALAC.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

3.3.1 Air Duct Removal

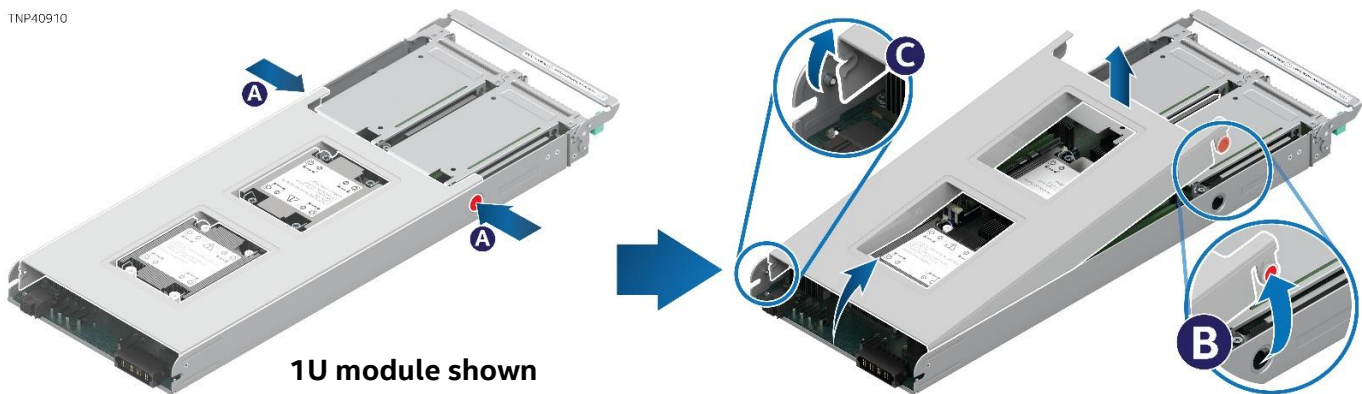


Figure 65. Removing the Air Duct

1. Press the latches on both sides of the module inwards (see Letter A).
2. Carefully lift the front edge of the air duct away from the module (see Letter B).
3. Pull the air duct away from the module (see Letter C).

3.3.2 Air Duct Installation

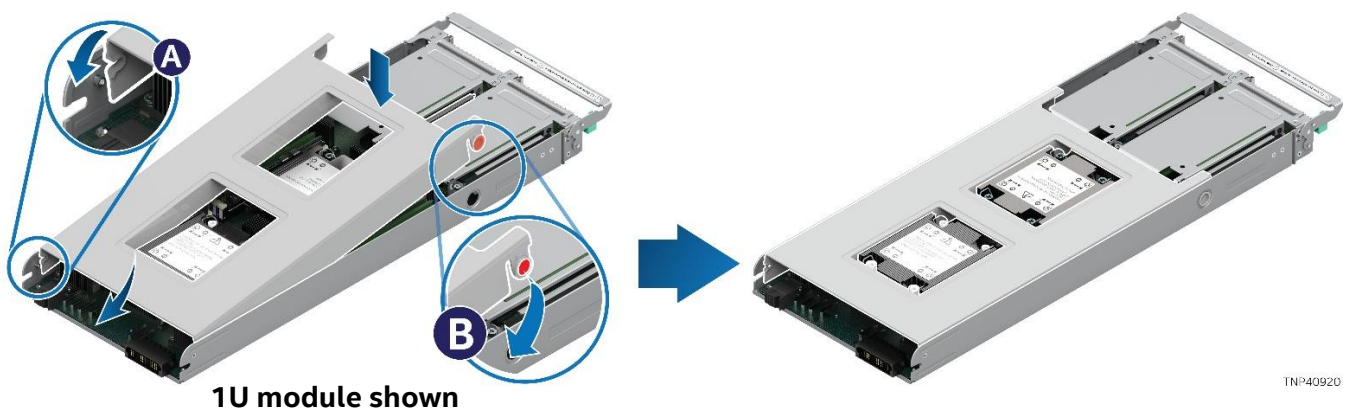


Figure 66. Installing the Air Duct

1. Align and attach the hinge slots on the back end of the air duct with the hinge posts on both sides of the module (see Letter A).
2. Lower the air duct down until both the left and right side latches snap into place (see Letter B).

3.4 Opening and Closing Storage Module (iPC D50TNP2MHSTAC)

The Storage Module top tray contains the enterprise data center SSD form factor (EDSFF) units while the base of the module contains the processors, memory, and add-in cards. This section provides instructions to open and close the top tray of the Storage Module.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

3.4.1 Opening the Top Tray

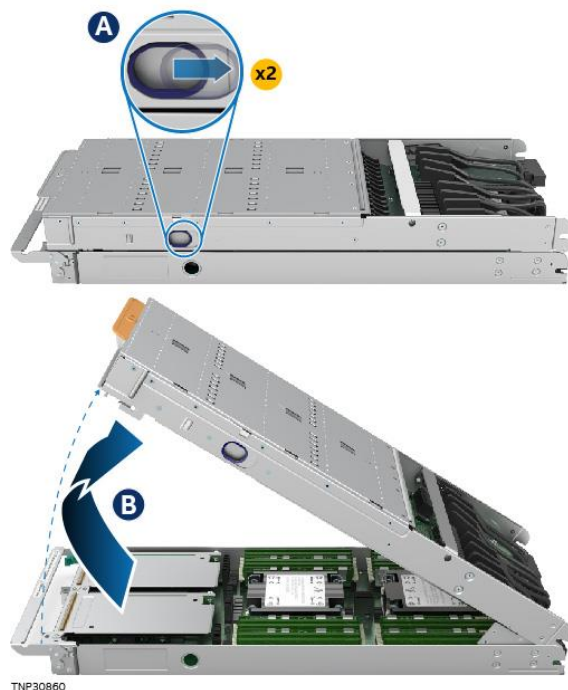


Figure 67. Removing the Air Duct

1. Unlock the latches on both sides of the top tray (see Letter A).
2. Lift the front edge of the top tray slowly until the lock clicks (see Letter B).

3.4.2 Closing the Top Tray

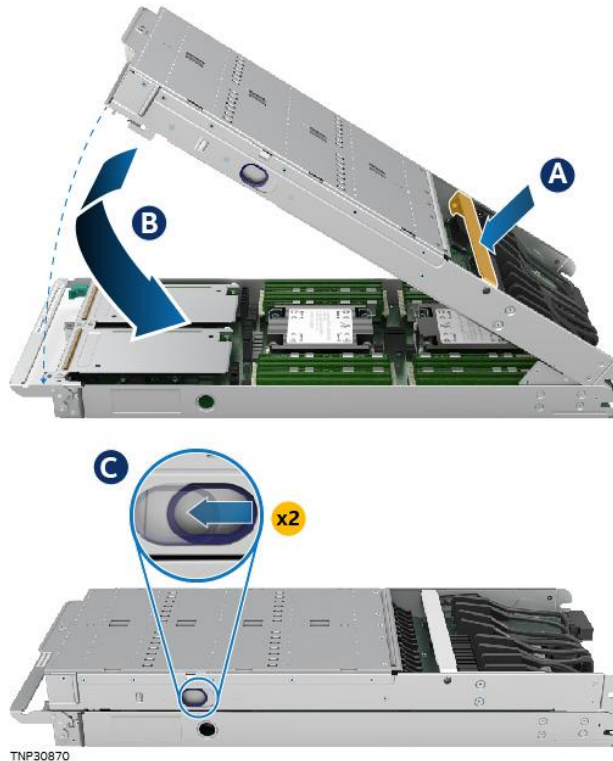


Figure 68. Removing the Air Duct

1. Push up the front edge of the top tray just slightly until the lock releases.
2. Push the handle bar down (see Letter A) with one hand. Hold the front edge of the top tray with the other hand and lower it (see Letter B).
3. Lock the latches on both sides of the top tray (see Letter C).

3.5 Add-in Card Option Installation

The Intel® Server System D50TNP supports either up to two (1U modules) or up to four (2U modules) low-profile PCIe* add-in cards.

This section provides assembly and installation procedures for modules that require low-profile add-in card installation. The following procedures apply to both 1U and 2U modules in both air-cooled and liquid-cooled configurations.

Note: The Accelerator Module has additional support for up to four full height, full length, double width PCIe* accelerator cards. Follow the installation procedures in [Section 3.7](#) for these cards.

Available Riser Card Options:

- 1U riser card (installed in 1U riser assembly) for 1U module using Intel® Server Board D50TNP1SB
- 1U riser card (installed in 1U riser assembly) for 1U module using Intel® Server Board D50TNP1SBCR
- 2U riser card (installed in 2U riser assembly) for 2U module

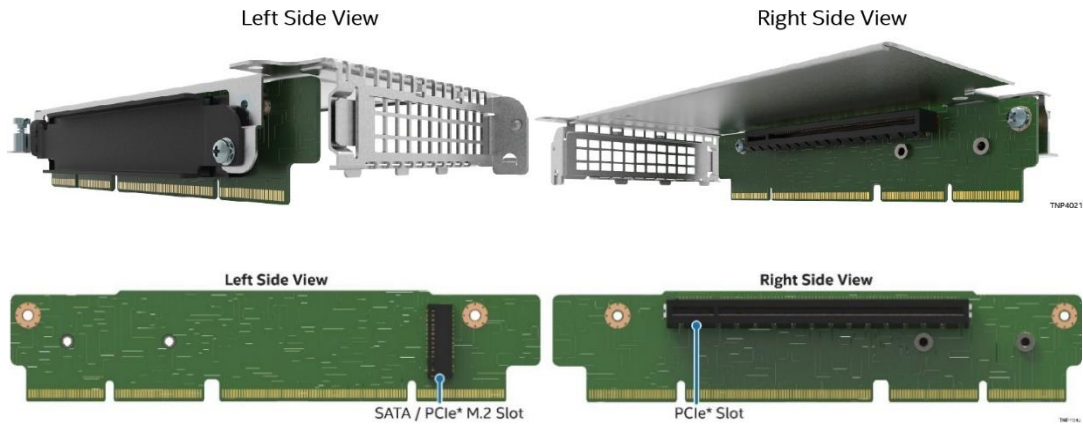


Figure 69. 1U Riser Assembly and Riser Card Features (iPCs D50TNP1MHCPAC and D50TNP2MHSTAC)

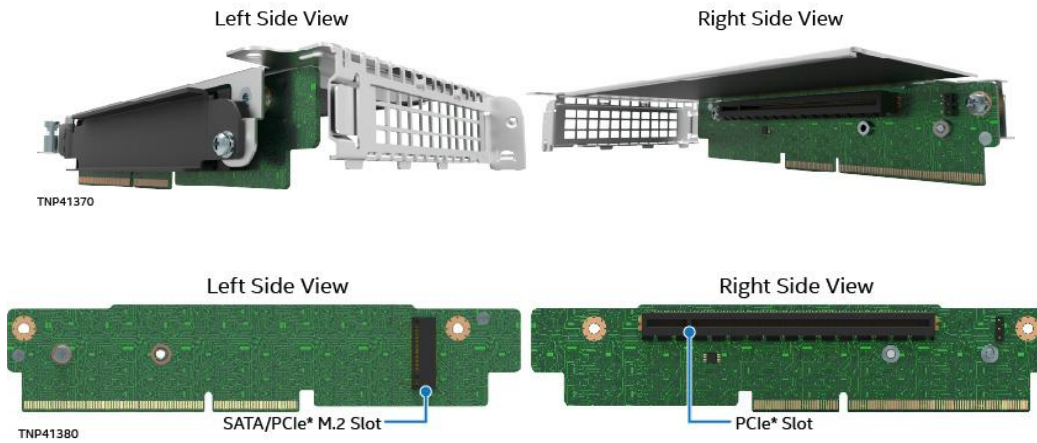


Figure 70. 1U Riser Assembly and Riser Card Features (iPCs D50TNP1MHCRCAC, D50TNP1MHCRLC, and D50TNP1MHEVAC)

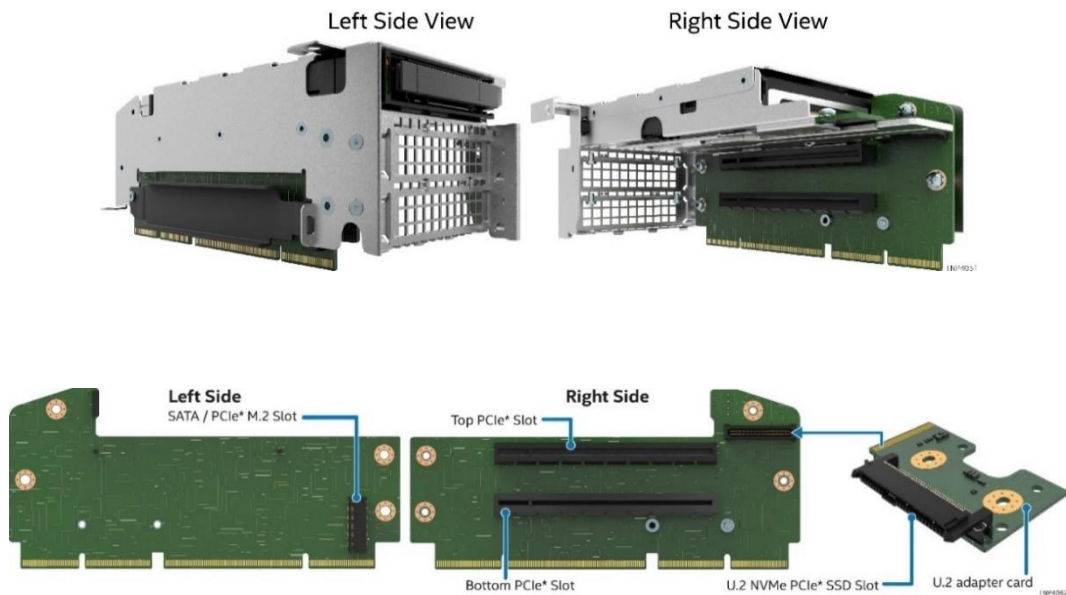
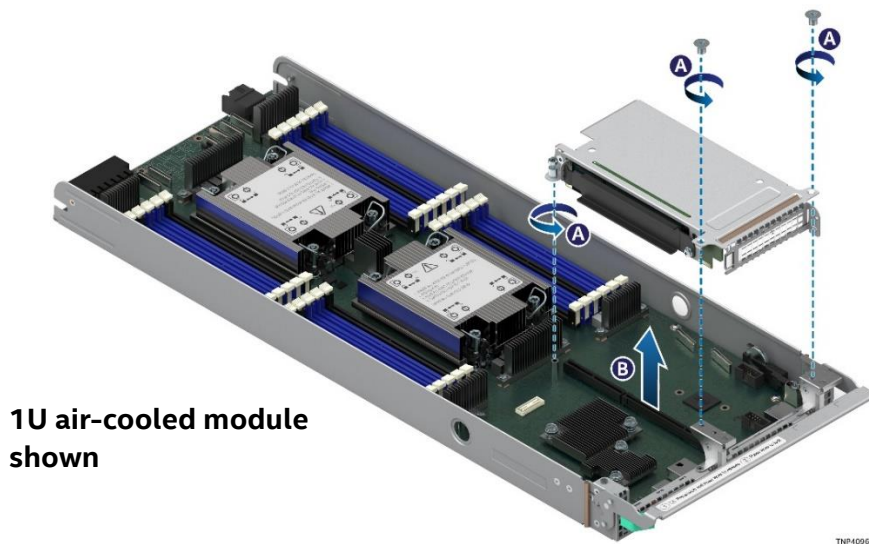


Figure 71. 2U Riser Assembly and Riser Card Features (iPCs D50TNP2MHSVAC and D50TNP2MFALAC)

Required Tools and Supplies:

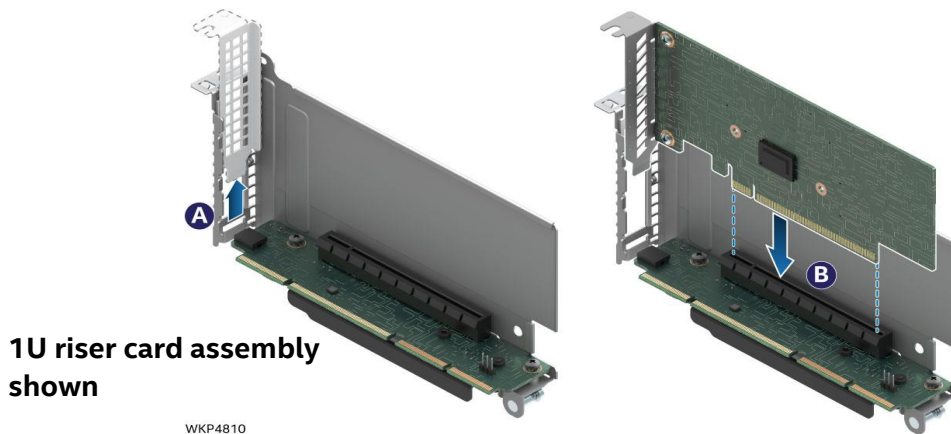
- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

3.5.1 Riser Assembly Removal**Figure 72. Removing a Riser Assembly**

1. Remove the three screws that secure the riser assembly to the module (see Letter A).
2. Carefully remove the riser assembly by lifting it up away from the module (see Letter B).

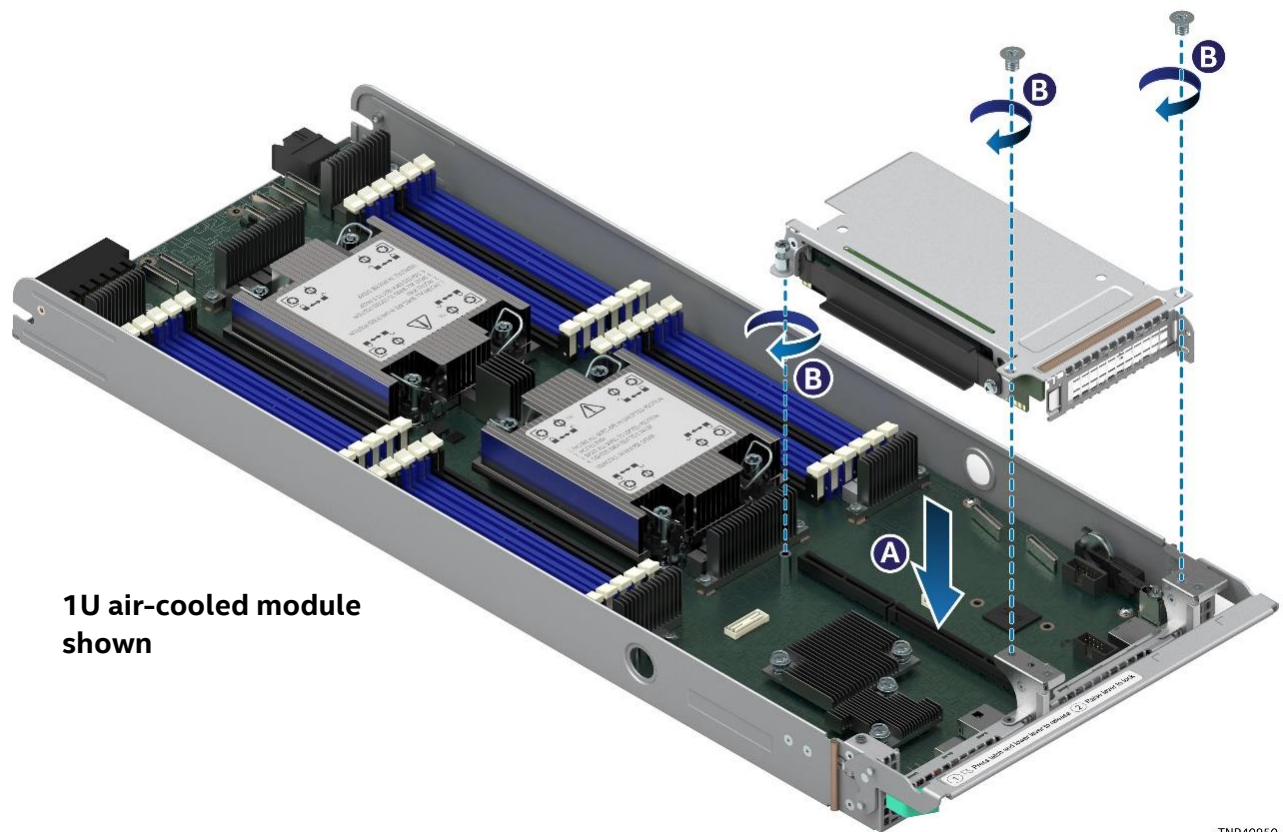
3.5.2 PCIe* Add-In Card Installation

The following procedures are identical for both 1U and 2U riser card assemblies.

**Figure 73. Installing an Add-in Card**

1. Remove the module to be serviced from the server chassis and place it onto an anti-static work surface (see [Section 3.2.1](#)).
2. Remove the selected riser assembly from the module (see [Section 3.5.1](#)).
3. If present, carefully remove the rear metal filler plate from the metal frame of the riser assembly (see Letter A).
4. Align the rear bracket of the add-in card to the rear opening of the riser assembly.
5. Carefully push the add-in card down into the PCIe* slot (see Letter B). Ensure that the add-in card is fully seated.
6. Reinstall the riser card assembly into the module (see [Section 3.5.3](#)).

3.5.3 Riser Assembly Installation



1U air-cooled module
shown

TNP40950

Figure 74. Installing a Riser Assembly into the Chassis

1. Align the riser card edge connector to the riser slot on the server board (see Letter A).
2. Carefully push down on the riser assembly until the riser card is securely seated into the riser slot.
3. Ensure that the three screw holes of the riser assembly are aligned and flush with the mounting holes of the module.
4. With three screws, secure the riser assembly to the module using 8 in-lb. of torque on each screw (see Letter B).

3.6 Liquid-Cooled Mellanox Add-In Card Installation (for Compute Module iPC D50TNP1MHCRLC)

The liquid-cooled compute module (D50TNP1MHCRLC) supports certain models of Mellanox add-in cards. Ensure that the add-in cards to be installed are compatible with liquid-cooled modules.

Required Components:

- Mellanox add-in cards compatible with Intel® Server D50TNP Family liquid-cooled modules

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

1. Ensure that the thermal pad is installed on top of the add-in card as shown below. Refer to the add-in card documentation for instructions to install the thermal pad.

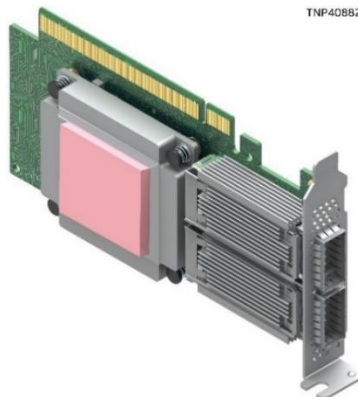


Figure 75. Mellanox Liquid Cooled Add-in Card with Thermal Pad

2. Ensure that the foam pads are installed on the bottom side of the add-in card.

Note: If the foam pads are not installed, the following steps can be performed with the instruction in the add-in card documentation.

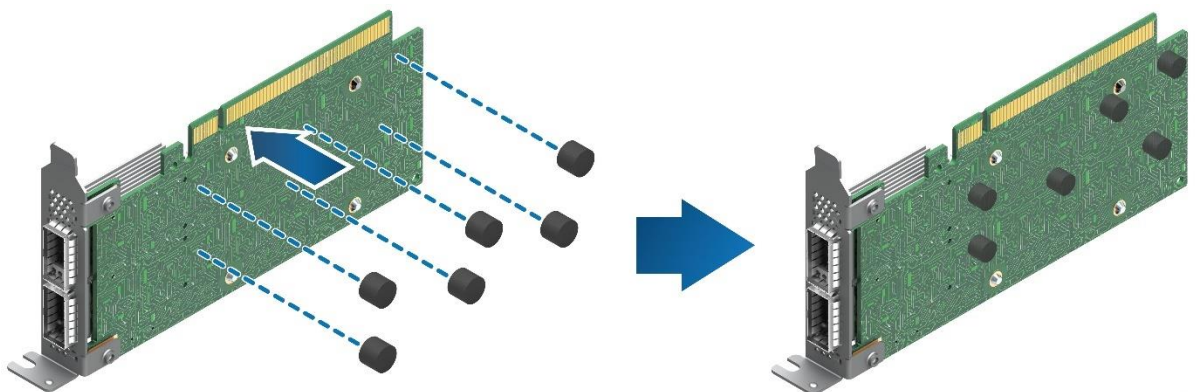


Figure 76. Installing the Mellanox Add-in Card Foam Pads

3. Prepare the foam pads and peel the liner off on the adhesive side.
4. Attach the adhesive side of the foam pads to the bottom side of the add-in card.
5. Install the Mellanox add-in card on the riser assembly following the steps in [Section 3.4](#).

3.7 Accelerator Module Add-in Card Installation (iPC D50TNP2MFALAC Only)

The Accelerator Module includes a special riser assembly that can support up to four x16 full height, full length, double width PCIe* add-in cards for acceleration solutions. The Accelerator Module riser assembly is on the right side of the module.

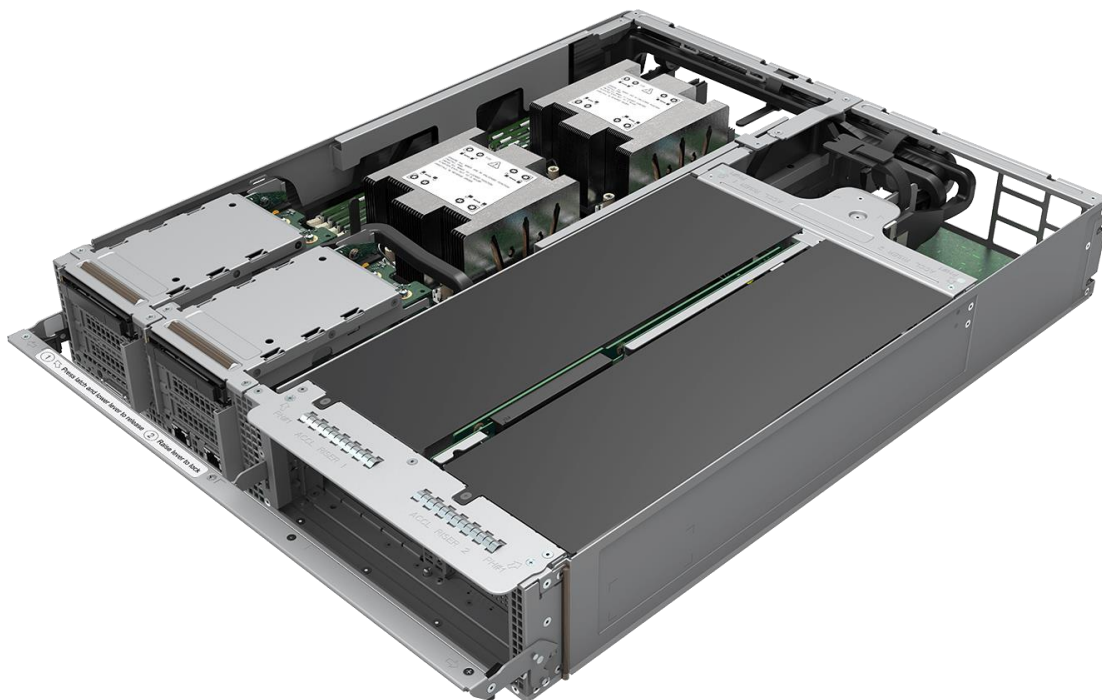
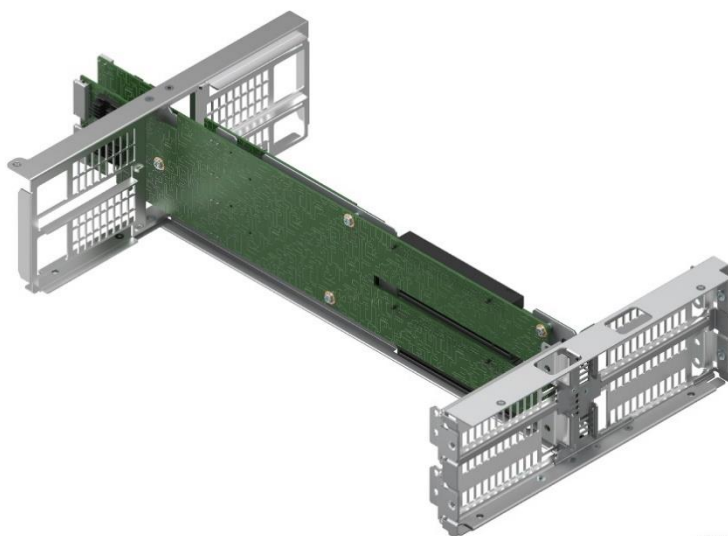


Figure 77. Air-Cooled Accelerator Module

The Accelerator Module riser assembly houses two riser cards (shown in the following figures) where each riser card supports up to two accelerator add-in cards. Both riser cards come preinstalled in the Accelerator Module riser assembly. Both riser cards come preinstalled in the Accelerator Module riser assembly.



TNP30730

Figure 78. Accelerator Module Riser Assembly

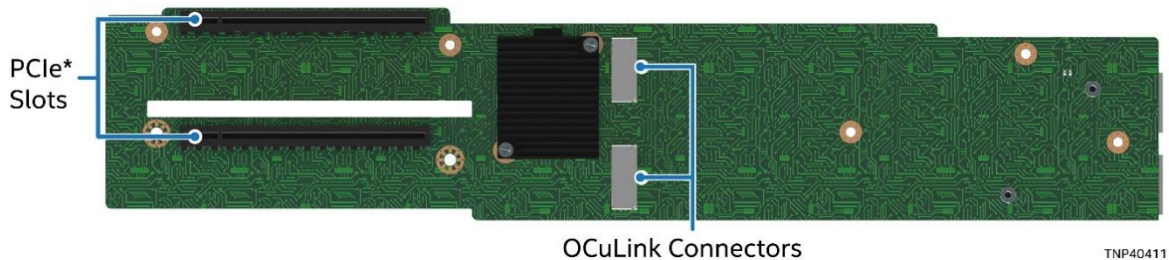


Figure 79. Accelerator Module Riser Card 1 – Front View

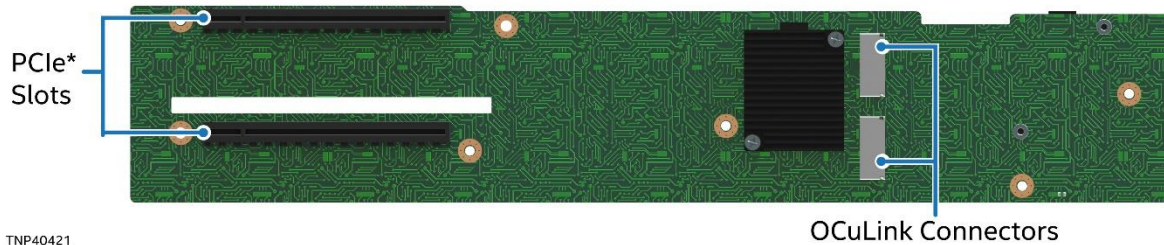


Figure 80. Accelerator Module Riser Card 2 – Front View

The Accelerator Modules support the following types of accelerator add-in cards:

- Nvidia* Tesla* V100
- Nvidia* Tesla* A100 40 GB
- Programmable Acceleration Card with Intel® Stratix® 10 SX FPGA

Note: Mixed add-in card types in a single module is not supported.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

Note: The following steps to replace the accelerator add-in card metal bracket should be performed along with the instructions in the add-in card documentation.

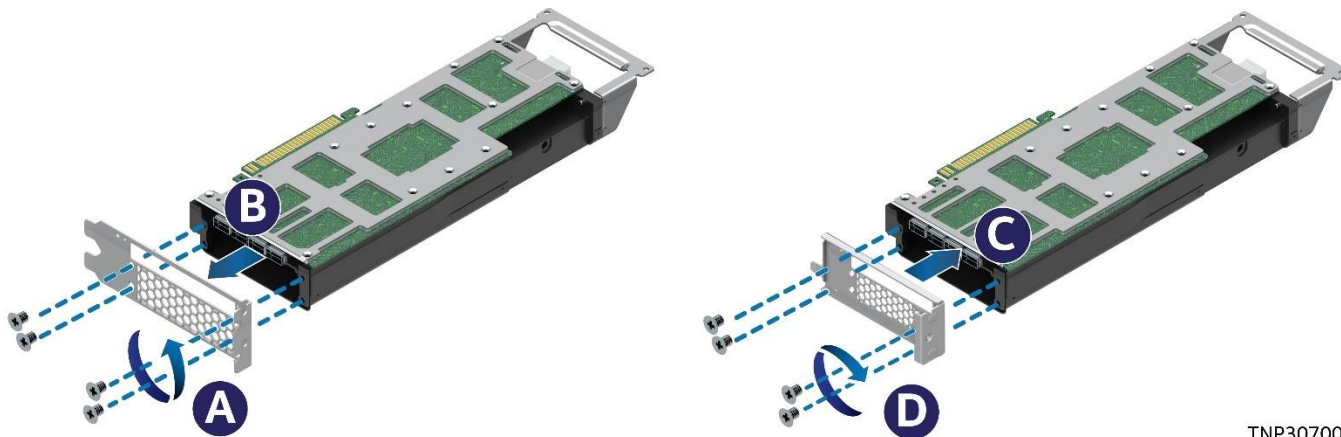


Figure 81. Replacing the Add-in Card Metal Bracket

1. Remove the screws that hold the original metal bracket on the accelerator add-in card (see Letter A).

2. Uninstall the original metal bracket (see Letter B) and replace it with the metal bracket in the accessory kit (see Letter C). Choose the one for the accelerator add-in card being installed.
3. Fasten the screws to secure the metal bracket to the accelerator add-in card (see Letter D).
4. If the accessory kit comes with the extension bracket, install it on the accelerator add-in card.

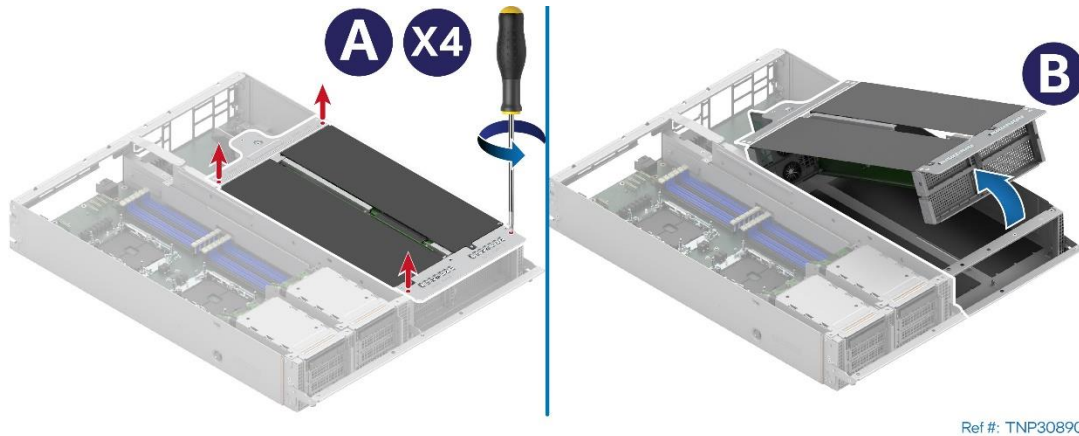


Figure 82. Removing the Accelerator Module Riser Assembly

5. Loosen the four captive screws on the Accelerator Module riser assembly (see Letter A).
6. Carefully lift the Accelerator Module riser assembly up slightly. Then, tilt the front side away from the module (see Letter B).

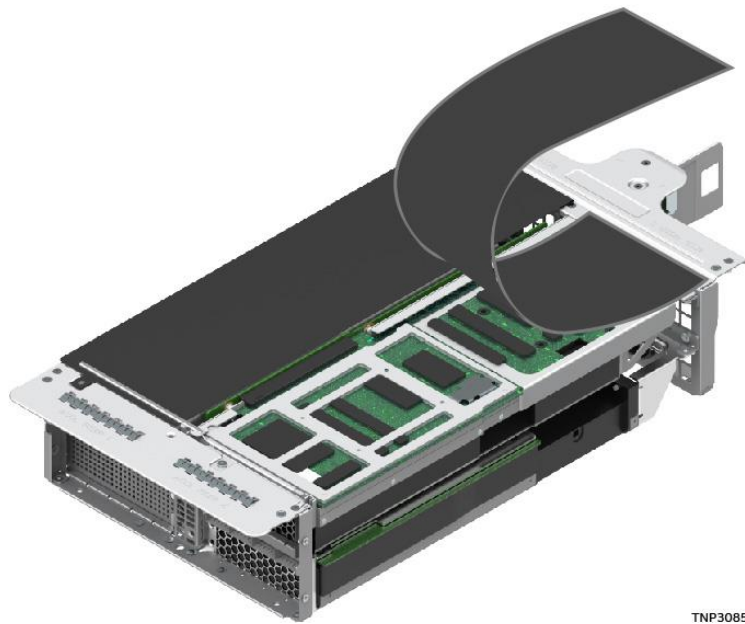


Figure 83. Lifting the Flap up on the Front Side of the Riser Assembly

7. Remove the screw that holds the flap and lift the flap up on the front side of the riser assembly.

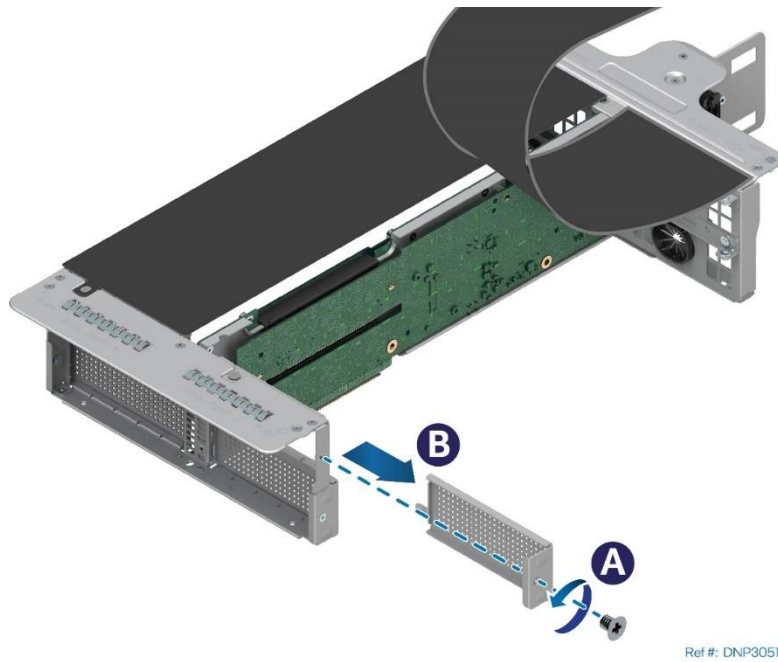


Figure 84. Removing the Original Metal Bracket

8. Uninstall the original metal bracket from the front side of the Accelerator Module riser assembly.

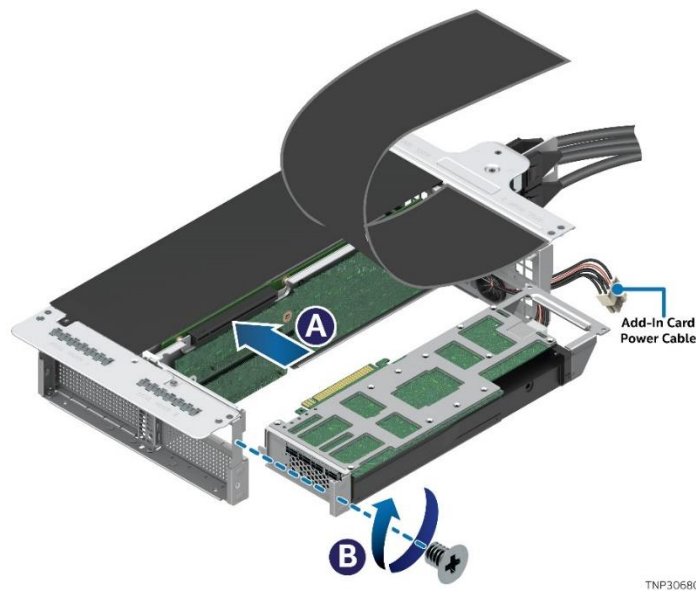


Figure 85. Installing the Accelerator Add-in Card in the Riser Assembly

9. Align the bracket of the accelerator add-in card with the opening of the riser assembly.
10. Install the power cables on the add-in card.
 - a. Route the accelerator add-in card power cable through the plastic shield opening in the rear of the riser assembly.
11. Carefully push the add-in card into the PCIe slot (see Letter A). Ensure that the add-in card is fully seated.
12. Fasten the screw on the metal bracket to secure the accelerator add-in card to the riser assembly (see Letter B).

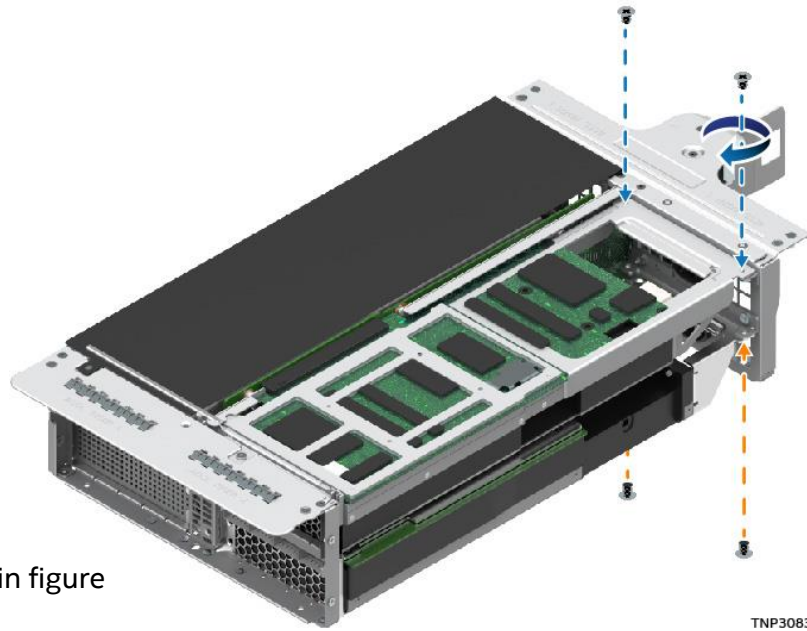


Figure 86. Securing the Accelerator Add-in Card in the Riser Assembly

13. Fasten the two screws on each corner of the back side to firmly attach the accelerator add-in card to the riser assembly.

Note: The direction of the screws on the back side depends on whether the accelerator add-in card is in the top slot or bottom slot of the riser assembly.

14. Repeat the [steps 1](#) through [13](#) to install other accelerator add-in cards as needed.
15. Install the screw that holds the flap on the front side of the riser assembly.

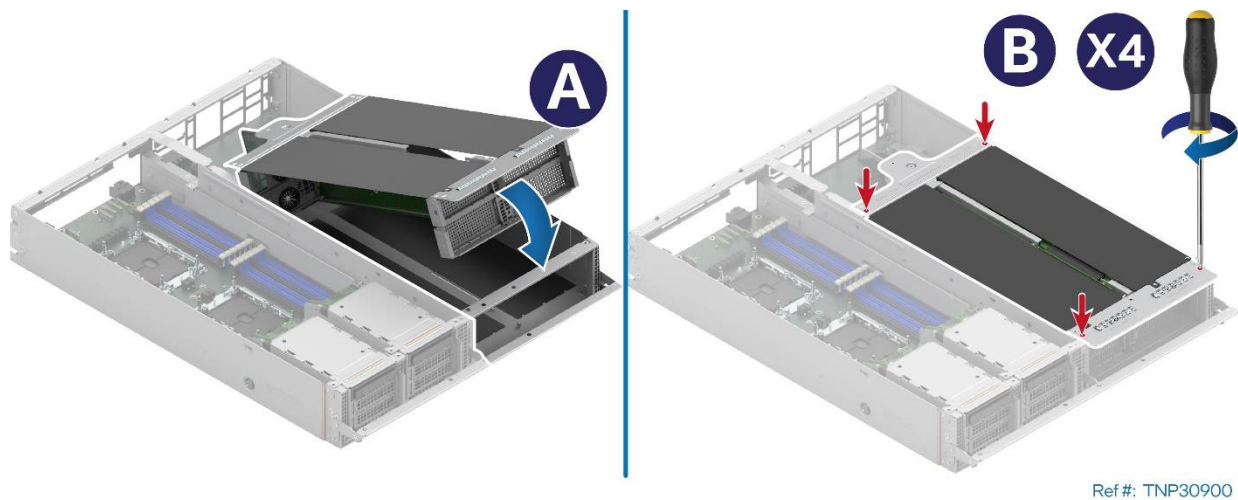


Figure 87. Installing the Accelerator Module Riser Assembly

16. Install the Accelerator Module riser assembly by tilting the front side back down to the module (see Letter A).
17. Fasten the captive screws to secure the Accelerator Module riser assembly to the module (see Letter B).

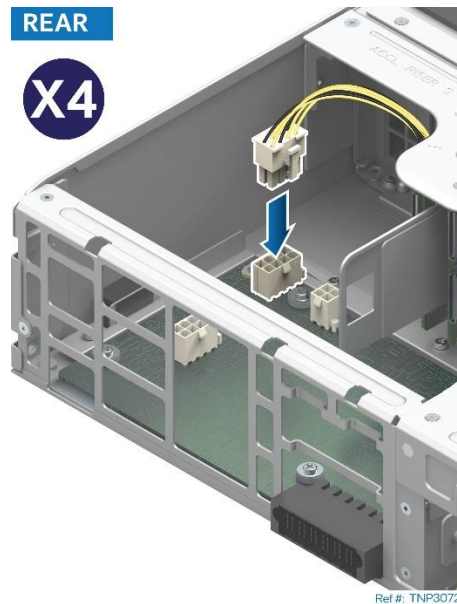


Figure 88. Connecting the Add-in Card Power Cable

18. Connect all accelerator add-in card power cables to the connectors on the power board.

3.8 Drive Carrier Extraction, Assembly, and Installation

The D50TNP2MHSVAC and D50TNP2MFALAC in the Intel® Server D50TNP Family support up to two hot-swap 2.5" form factor U.2 Solid State Drives (SSDs). Each drive is installed into a tool-less drive carrier. This section provides instructions for drive extraction from the chassis, drive assembly, and drive installation into the chassis.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

3.8.1 Drive Carrier Extraction

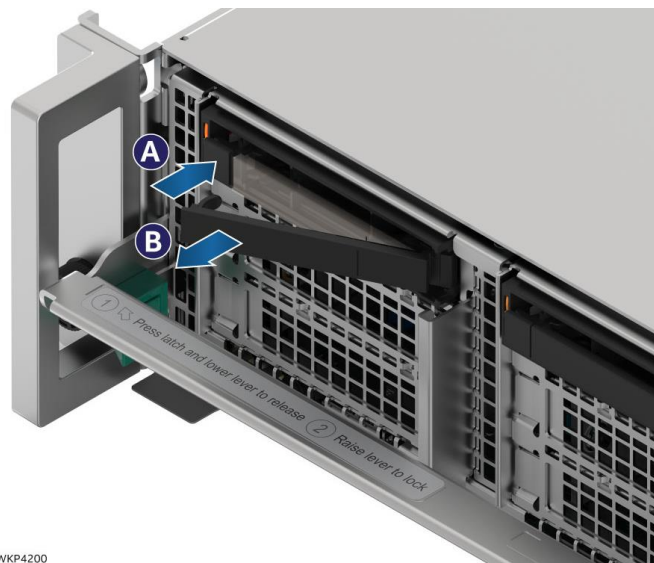


Figure 89. Drive Carrier Extraction from the Chassis

1. Press the button on the carrier face plate to release the lever (see Letter A).
2. Using the lever, pull the carrier from the drive bay (see Letter B).

3.8.2 Drive Carrier Assembly

Important Note: The Intel® Server System D50TNP is designed and tested to support 2.5" U.2 NVMe* SSDs only.

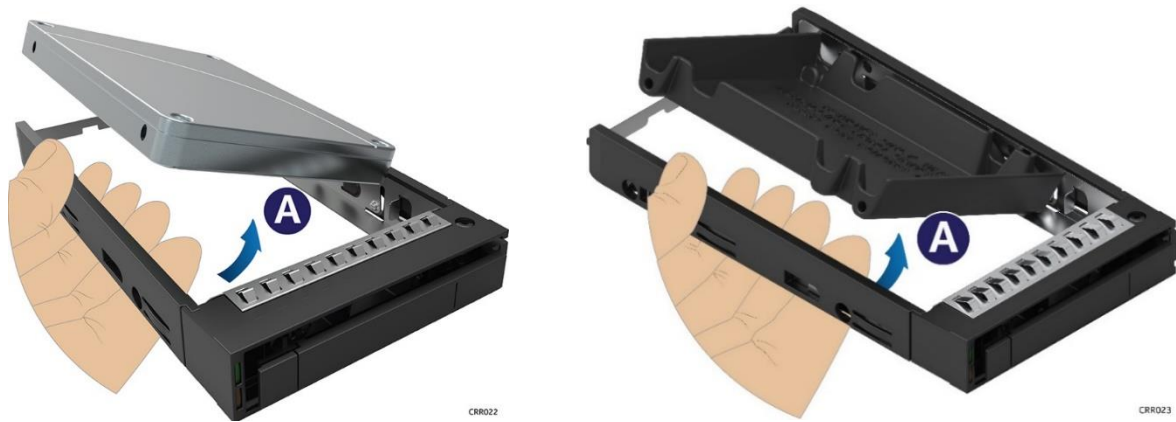


Figure 90. 2.5" Drive Carrier Assembly – Drive / Blank Removal

1. Remove the drive (or drive blank) from the carrier by gently rotating the top edge of a carrier rail outwards while simultaneously pushing the drive up from the bottom as shown in Figure 90.

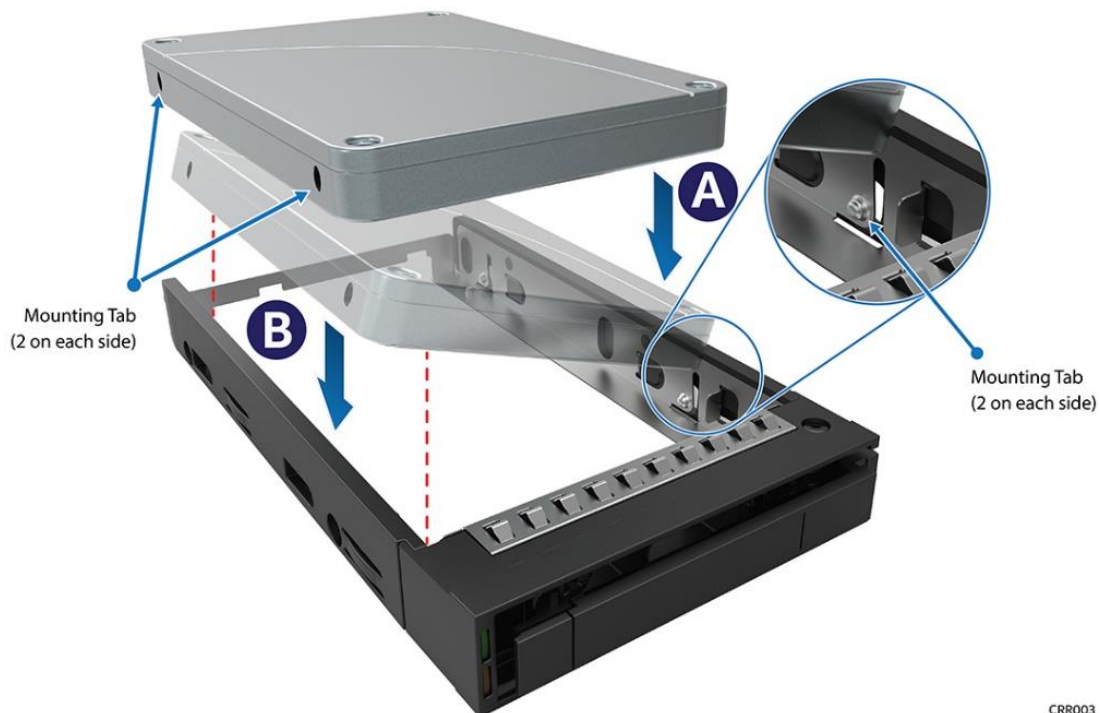


Figure 91. 2.5" Drive Carrier Assembly – Drive Installation into the Carrier

2. Carefully unpack the new drive, taking care not to touch any of the connector pins on the back side of the drive.
3. Position the rear drive connector toward the back of the drive carrier.
4. Align and position the mounting holes on one side of the drive over the mounting tabs on the drive carrier side rail (see Letter A).
5. Lower the other side of the drive into the carrier (see Letter B) and press down on the drive until all mounting tabs are locked in place.

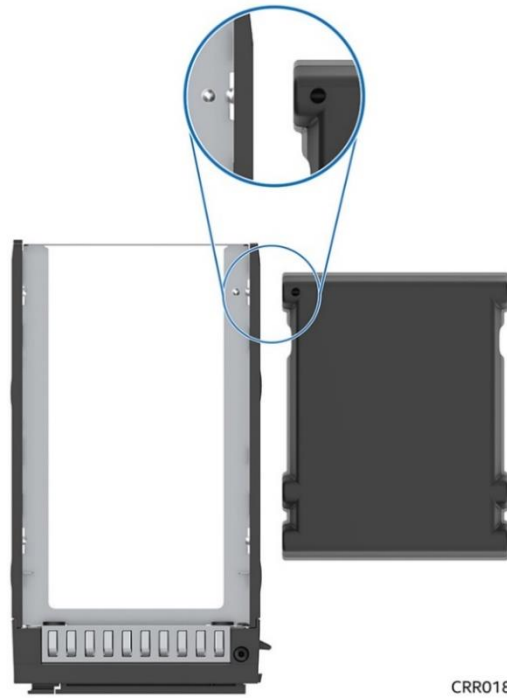


Figure 92. 2.5" Drive Carrier Assembly – Alignment Features

Note: The 2.5" drive blank and drive carrier each have alignment features (see Figure 92) ensuring proper assembly. When reinstalling a drive blank into the drive carrier, ensure that the features are aligned before installation. Failure to properly install a drive blank may result in the carrier assembly not fitting properly into the drive bay.

3.8.3 Drive Carrier Installation

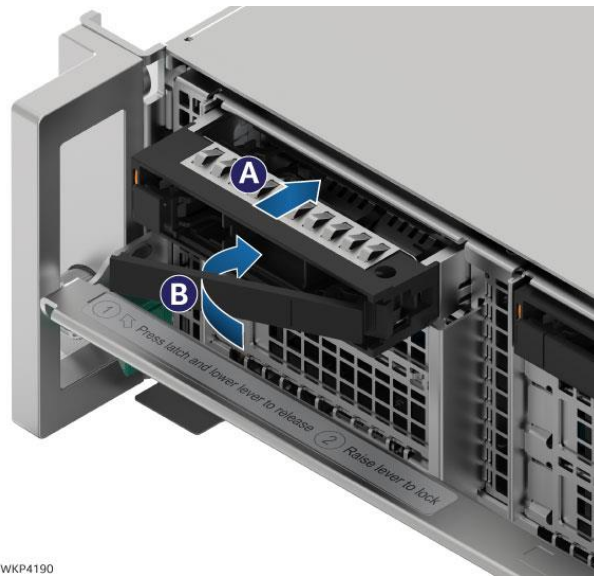


Figure 93. Drive Carrier Installation into the Chassis

1. Align the drive assembly with the open drive bay.
2. With the lever in the open position, insert the drive assembly into the drive bay (see Letter A) and push forward until the drive contacts with the internal backplane.
3. Complete the drive installation by closing the drive assembly lever until it locks into place (see Letter B).

3.9 M.2 Storage Devices Installation

Before following the procedures in this section, remove the selected module from the server chassis (see [Section 3.2](#)) and then remove the selected riser assembly from the module (see [Section 3.5.1](#)).

This procedure applies to both 1U and 2U riser assemblies with illustrations showing differences where applicable.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

3.9.1 M.2 SSD Installation for Air-Cooled Configurations

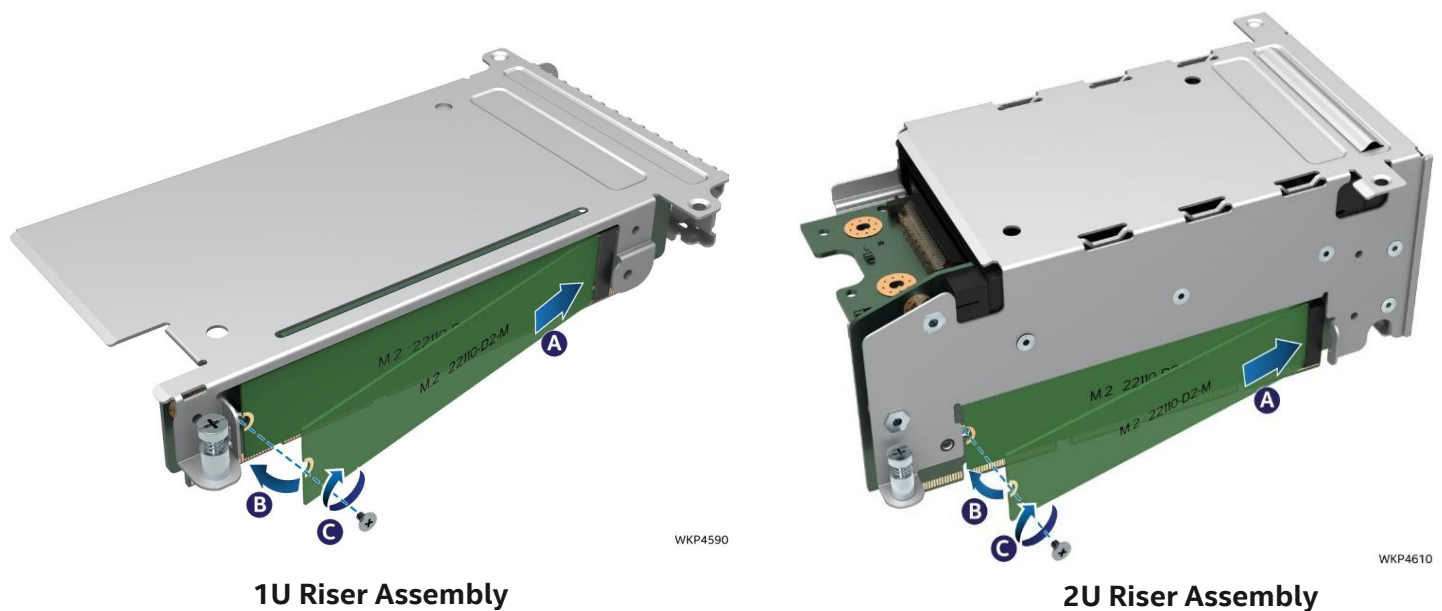


Figure 94. Installing Air-Cooled M.2 SSD

1. If present, remove the screw from the M.2 mounting standoff on the left side of the riser assembly.
2. Align the notch within the SSD edge connector with the key in the M.2 connector and insert the SSD into the connector (see Letter A).
3. Push the free edge of the SSD towards the riser assembly (see Letter B) and secure the SSD to the M.2 mounting standoff with the previously removed screw (see Letter C).
4. Install the M.2 heat sink (see [Section 3.9.2](#)).

3.9.2 Air-Cooled M.2 Heat Sink Installation

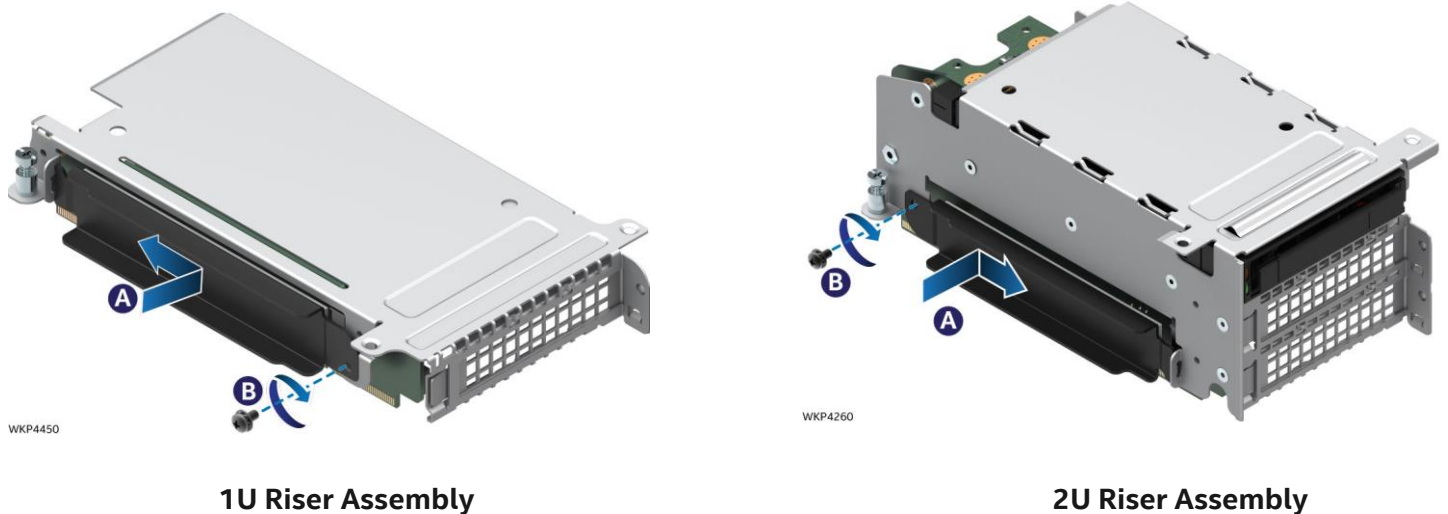


Figure 95. Installing Air-Cooled M.2 Heat Sink

1. If installing a new heat sink, peel off the protective film from the thermal interface material.
2. Align the heat sink to the riser assembly and slide into place in the direction shown (see Letter A).
3. Ensure that the screw holes are properly aligned. Then, secure the heat sink to the riser assembly with a screw (see Letter B).

3.9.3 M.2 SSD Installation for Liquid-Cooled configurations

Due to a different cooling mechanism for M.2 SSD between air-cooled and liquid-cooled configurations, the M.2 SSD for the liquid cooled configuration requires the installation of Thermal Interface Material (TIM) on the rear side of the M.2 SSD as shown below. The TIM pad installation is required only for M.2 SSDs with 110 mm form factor, M.2 SSDs with 80 mm form factor do not require the TIM pad installation.

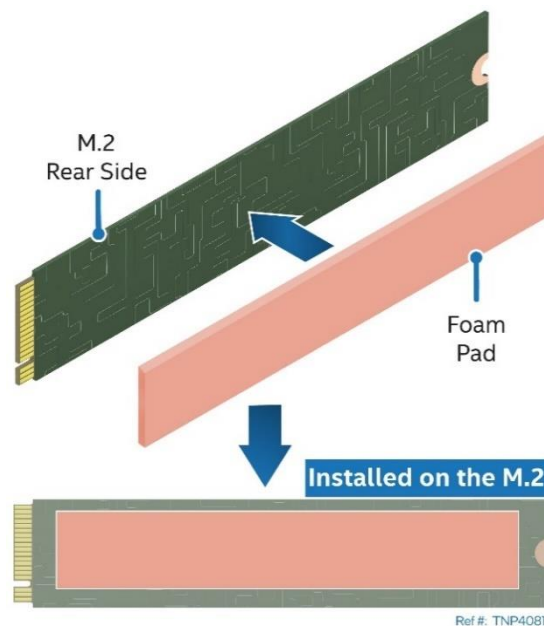
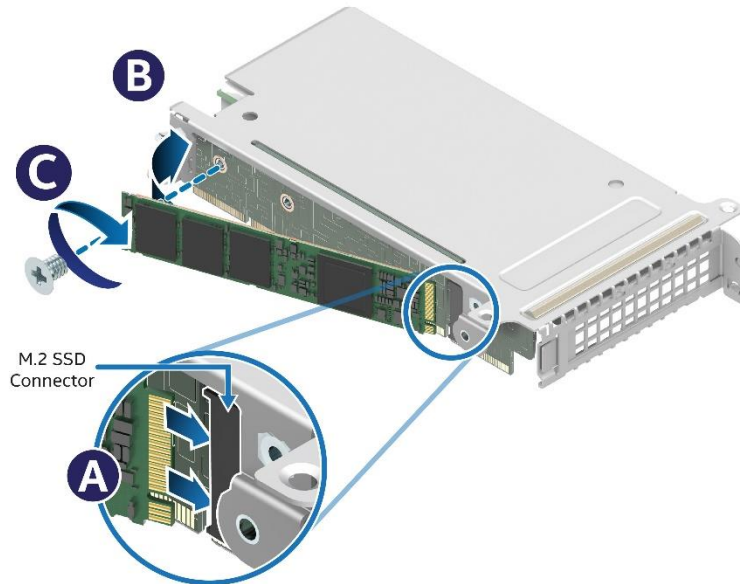


Figure 96. Installing the Thermal Interface Material (TIM) on M.2 SSD

1. Attach the adhesive side of the TIM pad to the rear side of the M.2 SSD with 110 mm form factor. Center the pad vertically and horizontally.

Note: Skip this step for M.2 SSD with 80 mm form factor.



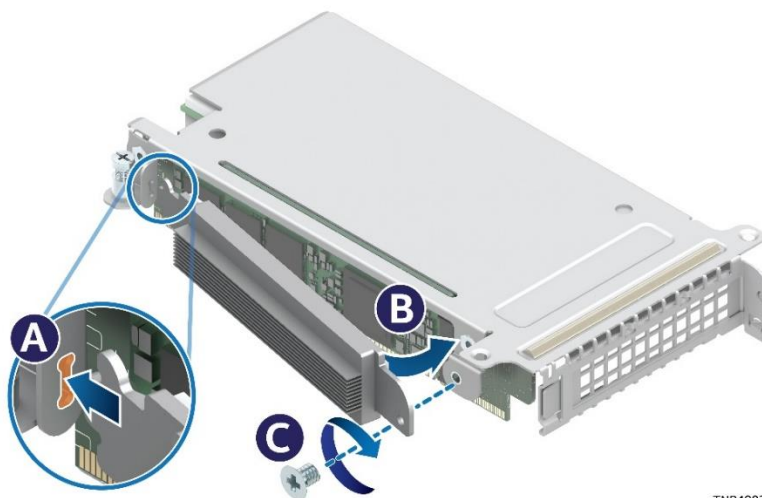
Ref #: TNP40822

Figure 97. Installing the M.2 SSD

2. If installed, remove the screw from the M.2 mounting standoff on the left side of the riser assembly.
3. Align the notch within the SSD edge connector with the key in the M.2 connector and insert the SSD into the connector (see Letter A).
4. Push the free edge of the SSD towards the riser assembly (see Letter B) and secure the SSD to the M.2 mounting standoff with the previously removed screw (see Letter C).

3.9.4 M.2 Cold Plate Installation – Liquid-Cooled Configurations Only

Due to the mechanical differences between the air-cooled and liquid-cooled configurations, the M.2 SSD cold plate is used to absorb the heat generated by the SSD in a liquid-cooled configuration, instead of a heat sink.



TNP40831

Figure 98. Installing the M.2 cold Plate

1. If present, peel off the protective film from the thermal interface material on the cold plate.
2. Align the cold plate to the riser assembly and slide into place in the direction shown (see Letter A).
3. Ensure that the screw holes are properly aligned (see Letter B) and secure the cold plate to the riser assembly with a screw (see Letter C).

3.10 EDSFF NVMe* Extraction and Installation (iPC D50TNP2MHSTAC Only)

D50TNP2MHSTAC supports up to 16 hot-swappable full-length PCIe* Enterprise Data Center SSD Form Factor (EDSFF) NVMe* drives. This section provides instructions for EDSFF drive extraction from the chassis and drive installation into the chassis.

Note: The module requires that all EDSFF drive slots be populated with either an EDSFF drive or an EDSFF blank. The EDSFF blanks should only be removed when replacing it with an actual EDSFF drive. When removing an EDSFF drive from the module, it must be replaced with an equivalent drive or EDSFF blank.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

3.10.1 EDSFF Drive Extraction

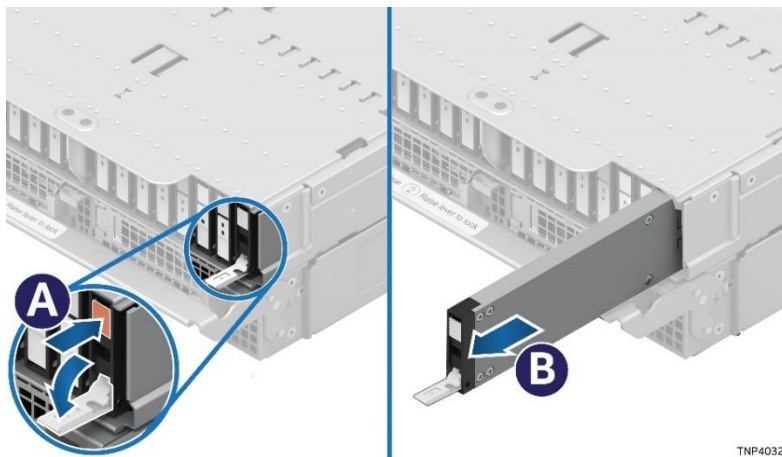


Figure 99. EDSFF Drive Extraction from the Chassis

1. Press the button on the top of the EDSFF drive to release the lever (see Letter A).
2. Using the lever, pull the EDSFF drive from the drive bay (see Letter B).

3.10.2 EDSFF Drive Installation

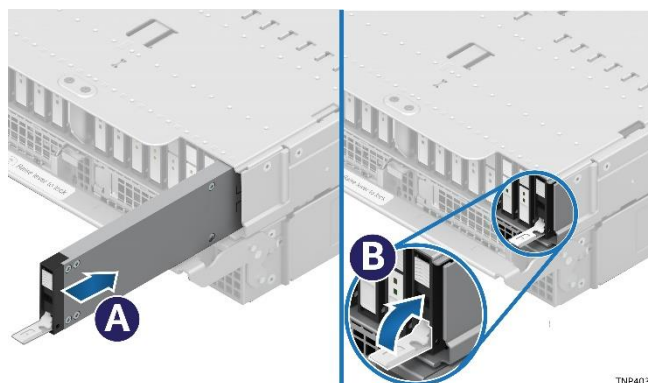


Figure 100. EDSFF drive Installation into the Chassis

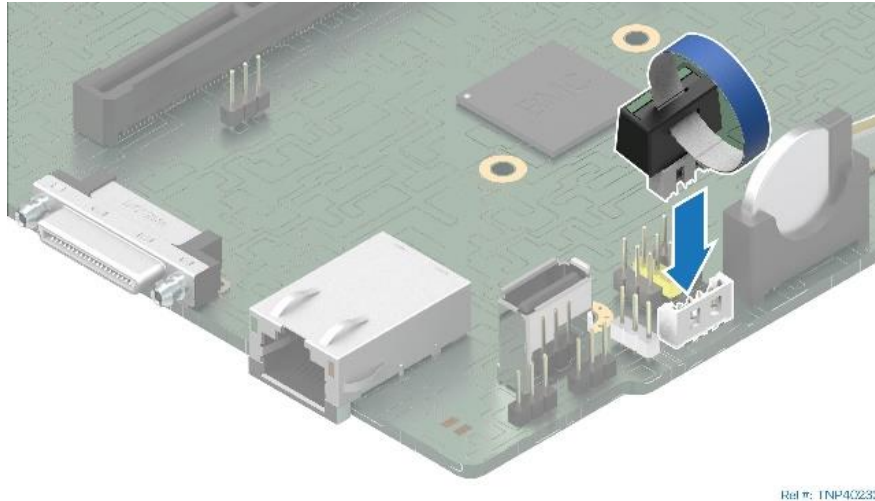
1. Align the EDSFF drive with the open drive bay.
2. With the lever in the open position, insert the EDSFF drive into the drive bay (see Letter A) and push forward until the EDSFF drive contacts with the internal docking board.
3. Complete the EDSFF drive installation by closing the drive assembly lever until it locks into place (see Letter B).

3.11 Intel® Virtual RAID on CPU (Intel® VROC) Upgrade Key Installation

This section provides instructions to install an Intel® VROC Key in the system. Refer to the *Intel® Server D50TNP Family Configuration Guide* for available options.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)



Ref #: TNP40233

Figure 101. Installing the Intel® VROC Upgrade Key

1. Remove the module to be serviced from the server chassis and place it on an anti-static work surface (see [Section 3.2.1](#)).
2. Remove the riser assembly from Riser Slot 2 (see [Section 3.5.1](#)).
3. Remove the Intel® VROC Upgrade Key from its packaging.
4. Locate the white 4-pin key connector near the right edge of the server board.
5. Place the key over the connector and confirm that the orientation of the key matches that of the connector.
6. Press the key down onto the connector until it locks into place.

3.12 Trusted Platform Module (TPM) Installation

This section provides instructions to install a Trusted Platform Module (TPM) in the system. Refer to the *Intel® Server D50TNP Family Configuration Guide* for available options.

Required Tools and Supplies

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

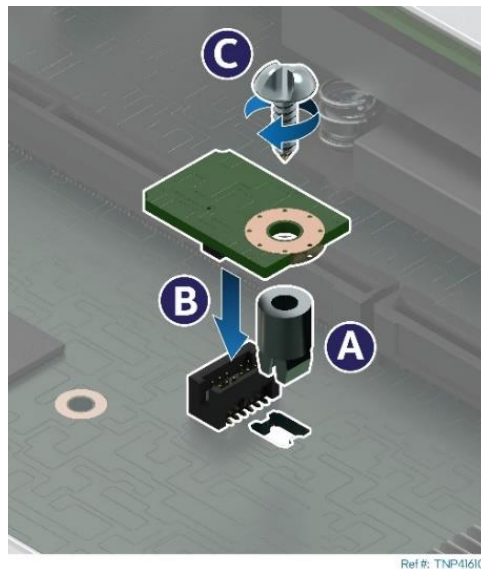


Figure 102. Installing the Trusted Platform Module (TPM)

1. Remove the module to be serviced from the server chassis and place it on an anti-static work surface (see [Section 3.2.1](#)).
2. Remove the riser assembly from Riser Slot 2 (see [Section 3.5.1](#)).
3. Locate the TPM module connector on the server board.
4. Insert the plastic stand-off into the server board mounting hole (see Letter A).
5. Place the TPM module over the connector and confirm the orientation of the module.
6. Press the module down onto the connector (see Letter B).
7. Secure the TPM module to the stand-off with the fastener screw (see Letter C).

3.13 Ethernet Management Port Module (EMP Module) (iPC AXxFCMP)

Your system may or may not come preconfigured with an Ethernet Management Port Module. This section provides instructions for the installation and removal of this accessory option. The EMP module is hot-swap capable and can be installed or removed without powering down the system or any of its modules. This procedure applies to all D50TNP chassis types.

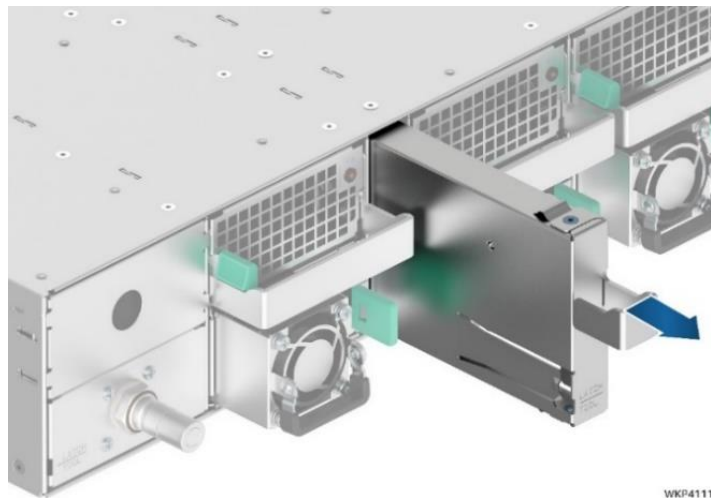


Figure 103. Removing the EMP Blank

1. If present, remove the EMP blank from the back of the server chassis by pulling it out from the chassis as shown in [Figure 103](#).

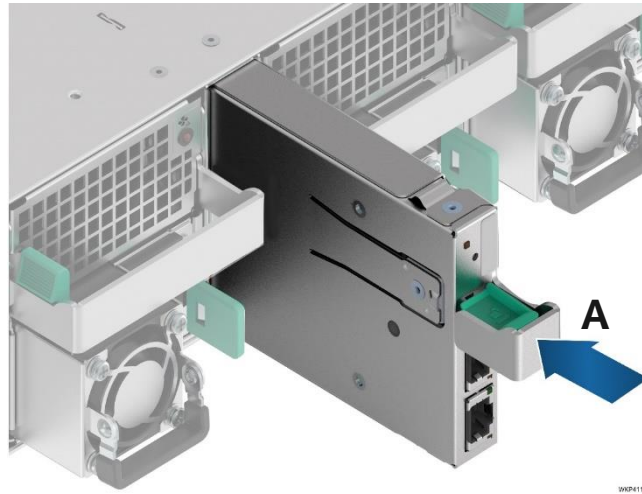


Figure 104. Installing the EMP Module/Blank

2. Install the EMP module, by sliding it into the open EMP bay until it locks into place (see Letter A).

4. System Software Updates and Configuration

Each module in the Intel® Server D50TNP Family includes a software stack that contains BIOS, BMC firmware, Intel® Management Engine (Intel® ME) firmware, and both FRU and SDR data. A full software stack is installed during the system manufacturing process but may not be the latest available version. Intel highly recommends updating the full system software stack on each installed module to the latest available version for optimal performance and system reliability. A System Update Package (SUP) containing the latest available system software stack can be downloaded from the following Intel website:

<http://downloadcenter.intel.com>.

Ensure that the embedded platform management subsystem is configured properly. The latest FRU and SDR data for each module must be installed after updating the full system software stack. Updated FRU and SDR data allows the platform management subsystem to monitor the specific system sensors used to determine appropriate system cooling, optimal performance, and accurate error reporting. FRU and SDR data is loaded by using the FRUSDR Utility that is included with the System Update Package (SUP).

4.1 Using the BIOS Setup Utility

This section describes how to access and navigate the embedded <F2> BIOS Setup Utility. This utility can be used to view and configure system settings that determine how the server operates.

4.1.1 Entering BIOS Setup

To enter the BIOS Setup using a keyboard (or emulated keyboard), press the <F2> function key during boot time when the OEM or Intel Logo Screen or the POST Diagnostic Screen is displayed.

Note: At initial system power-on, a USB Keyboard will not be functional until the USB Controller has been initialized during the power on self test (POST) process. Only after that time will the key strokes from a USB keyboard be recognized, allowing for access into the <F2> BIOS Setup Utility.

The following message is displayed on the Diagnostic Screen or under the Quiet Boot Logo Screen:

```
Press <F2> to enter setup, <F6> Boot Menu, <F12> Network Boot
```

After pressing the <F2> key, the system will eventually load the BIOS Setup Utility and display the BIOS Setup Main Menu screen.

Note: Should serious system errors occur during the POST process, the regular system boot will stop and the system will load the BIOS Setup Utility and display the Error Manager Screen. The Error Manager Screen will list and provide information about the specific boot errors detected.

4.1.2 No Access to the BIOS Setup Utility

If the BIOS Setup Utility is not accessible by pressing the <F2> key or other described access methods. It may be necessary to restore the BIOS default settings. For information relating to restoring BIOS defaults, see [Appendix D](#).

4.1.3 Navigating the BIOS Setup Utility

The BIOS Setup Utility consists of several menu screens, each holding either informational fields and/or configurable system setup options.

The bottom right portion of each menu screen provides a list of commands that are used to navigate through the BIOS Setup Utility. These commands are displayed at all times.

If no administrator or user password is used, all available settings are configurable and can be set by anyone with access to BIOS Setup.

System settings that are not configurable, because of security settings or configuration limits, are grayed out and are not accessible.

Table 3. BIOS Setup: Keyboard Command Bar

| Key | Option | Description |
|---------|-----------------|--|
| <Enter> | Execute Command | <p>The <Enter> key is used to:</p> <ul style="list-style-type: none"> • Activate submenus when the selected feature is a submenu, or • Display a pick list if a selected option has a value field, or • Select a subfield for multi-valued features like time and date. <p>If a pick list is displayed, the <Enter> key selects the currently highlighted item, undoes the pick list, and returns the focus to the parent menu.</p> |
| <Esc> | Exit | <p>The <Esc> key provides a mechanism for backing out of any field. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered.</p> <p>When the <Esc> key is pressed in any submenu, the parent menu is re-entered. When the <Esc> key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.</p> <p>If “No” is selected and the <Enter> key is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <Esc> was pressed, without affecting any existing settings. If “Yes” is selected and the <Enter> key is pressed, the setup is exited and the BIOS returns to the main System Options Menu screen.</p> |
| ↑ | Select Item | The up arrow is used to select the previous value in a pick list, or the previous option in a menu item’s option list. The selected item must then be activated by pressing the <Enter> key. |
| ↓ | Select Item | The down arrow is used to select the next value in a menu item’s option list, or a value field’s pick list. The selected item must then be activated by pressing the <Enter> key. |
| ← → | Select Menu | The left and right arrow keys are used to move between the major menu pages. The keys have no effect if a sub-menu or pick list is displayed. |
| <Tab> | Select Field | The <Tab> key is used to move between fields. For example, <Tab> can be used to move from hours to minutes in the time item in the main menu. |
| - | Change Value | The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list. |
| + | Change Value | The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboards but will have the same effect. |
| <F9> | Setup Defaults | <p>Pressing the <F9> key causes the following to display:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Load Optimized Defaults? Yes No</p> </div> <p>If “Yes” is highlighted and <Enter> is pressed, all setup fields are set to their default values. If “No” is highlighted and <Enter> is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <F9> was pressed without affecting any existing field values.</p> |
| <F10> | Save and Exit | <p>Pressing the <F10> key causes the following message to display:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Save configuration and reset? Yes No</p> </div> <p>If “Yes” is highlighted and <Enter> is pressed, all changes are saved and the setup is exited. If “No” is highlighted and <Enter> is pressed, or the <Esc> key is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.</p> |

5. System Packaging Assembly Instructions

The original Intel packaging is designed to provide protection to a fully configured system and tested to meet ISTA (International Safe Transit Association) Test Procedure 3A (2018). The packaging is designed to be reused.

The original packaging includes two layers of boxes – an inner box and the outer shipping box – and various protective inner packaging components. The boxes and packaging components are designed to function together as a protective packaging system. When reused, all the original packaging material must be used, including both boxes and each inner packaging component. In addition, all inner packaging components must be reinstalled in the proper location to ensure adequate protection of the system for subsequent shipment.

Note: The design of the inner packaging components does not prevent improper placement within the packaging assembly. Only one correct packaging assembly will allow the package to meet the ISTA (International Safe Transit Association) Test Procedure 3A (2018) limits.

Failure to follow the specified packaging assembly instructions may result in damage to the system during shipment.

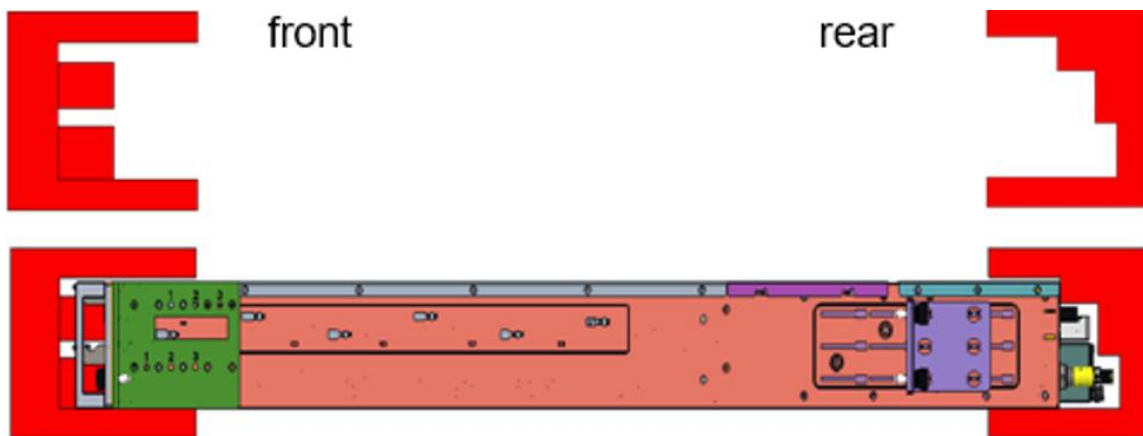
1. Place two foam inserts into the inner box as shown. Note the foam insert orientation.



2. Wrap the red foam sheet around the system.



3. Install the red front foam in the front of the system (left piece in the following illustration) and the red rear foam in the rear of the system (right piece in the following illustration).



4. Carefully place the system into the shipping bag and tape the bag shut.
5. Carefully lower the system into the inner shipping box as shown below.



- Put the front foam on the left top and the rear foam on the right top as shown below.



- Place the accessory box in the middle as shown below.



8. Fold the top flaps of the inner box closed, end flaps first, followed by side flaps.

Note: By design, the two side flaps will not meet. Do not tape side flaps shut.



9. Fold the top flaps of the outer box closed, end flaps first, followed by the side flaps.
10. Tape the outer box using an H-pattern. Across the center first, followed by both ends.



6. System / Module – Features Overview

This chapter provides service personnel a reference to identify and locate the features associated with the Intel® Server D50TNP Family.

6.1 System Feature Identification

All systems in the Intel® Server D50TNP Family feature front loading modules. The illustrations on the following pages provide a quick reference identifying the key features of all supported system configurations.

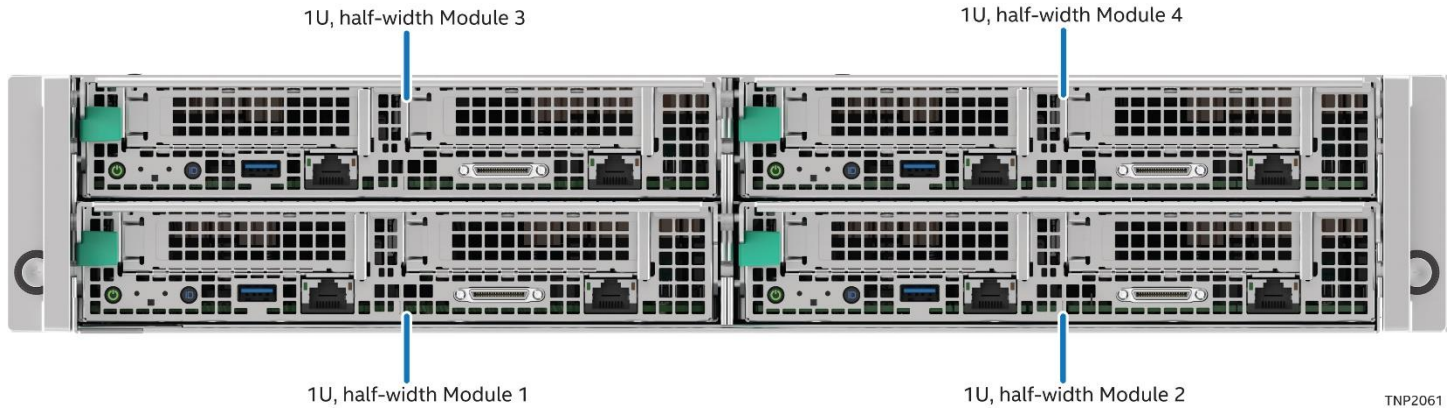


Figure 105. Module Identification for four-Module System Configuration



Figure 106. Module Identification for Two-Module System Configuration

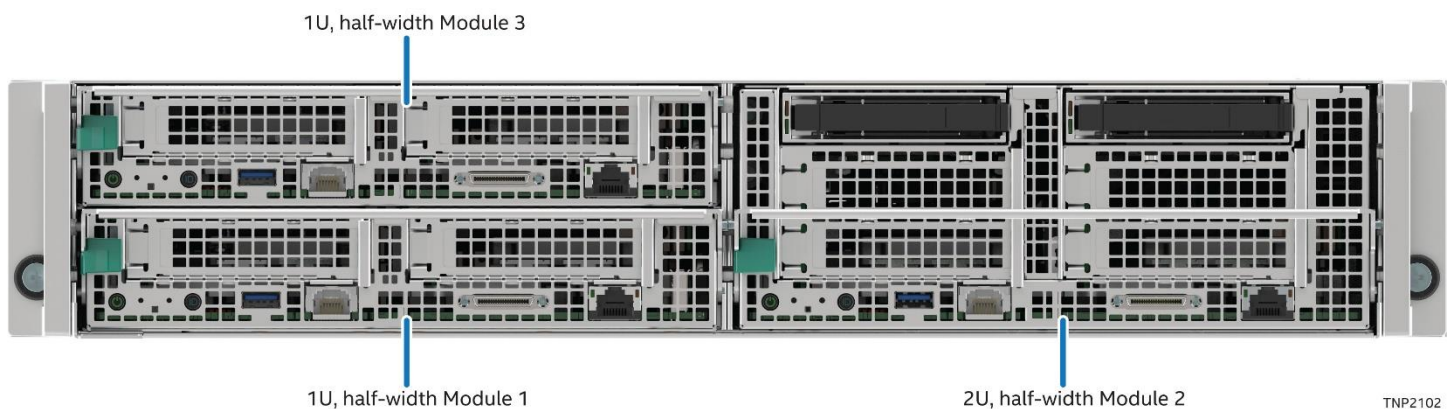


Figure 107. Module Identification for Three-module System Configuration

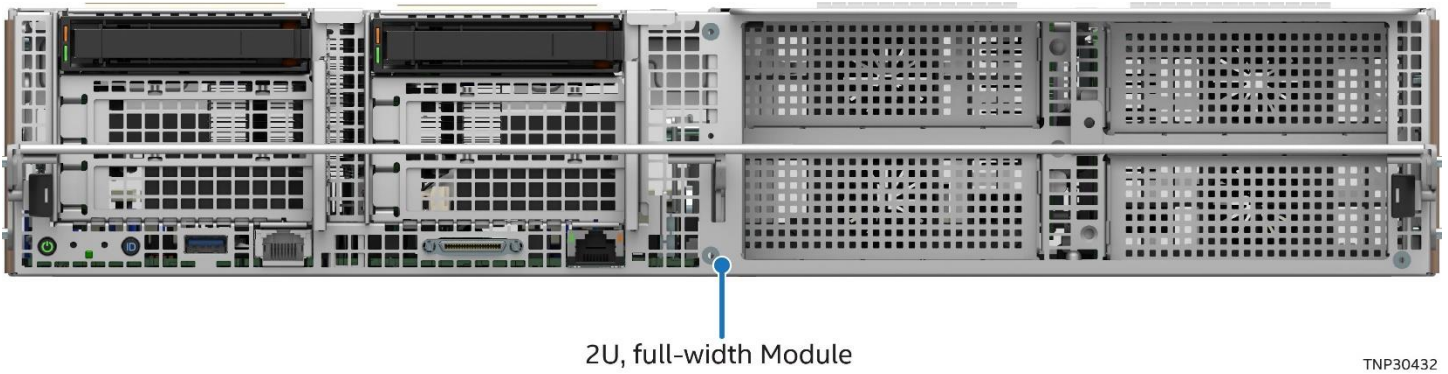


Figure 108. Module Identification for One-Module System Configuration

Systems are offered with either liquid-cooling or air-cooling options. The following illustrations identify key system features for both cooling options.

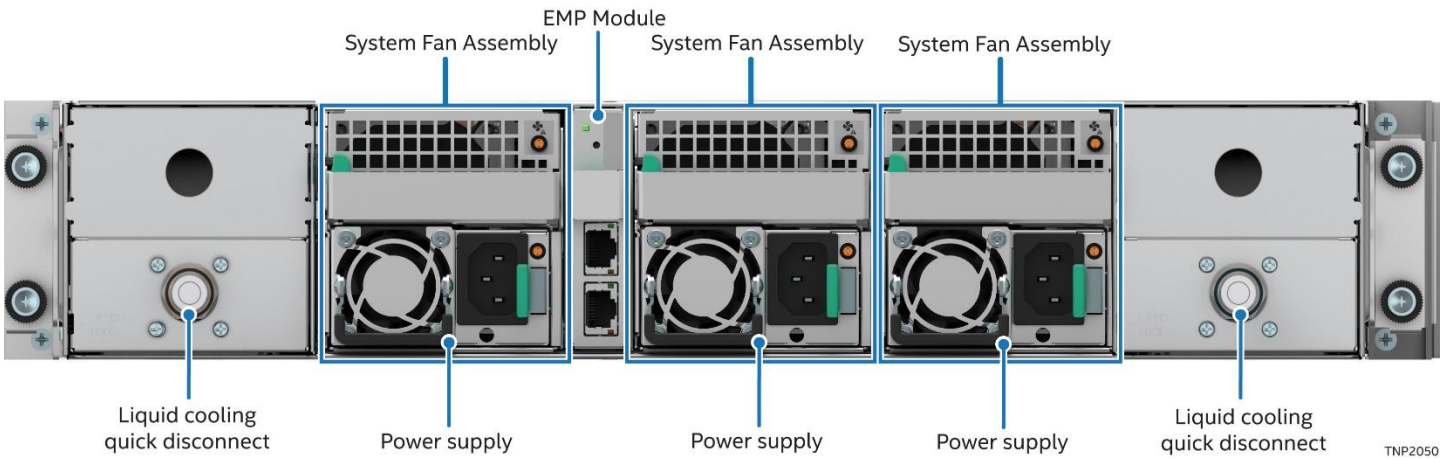


Figure 109. Liquid-Cooled System Back View

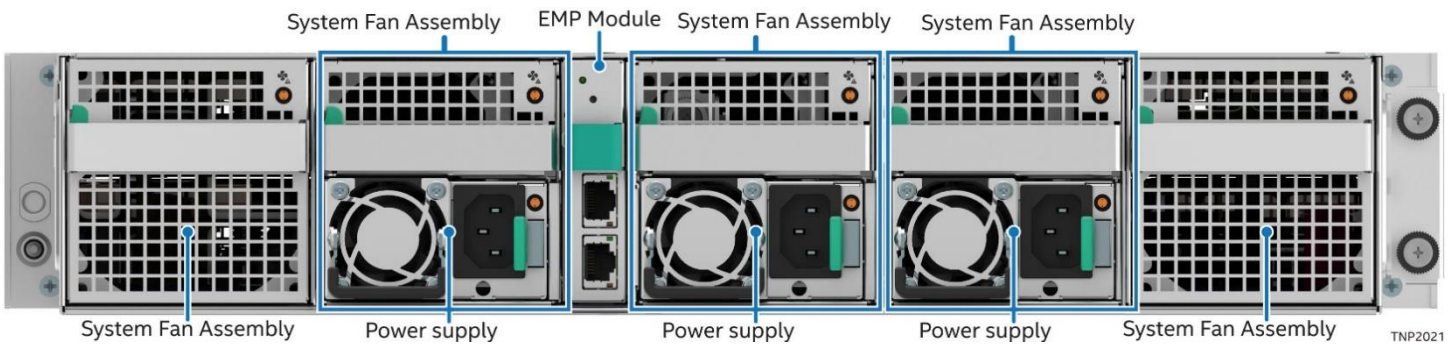


Figure 110. Air-Cooled System Back View

6.2 Front Panel Features

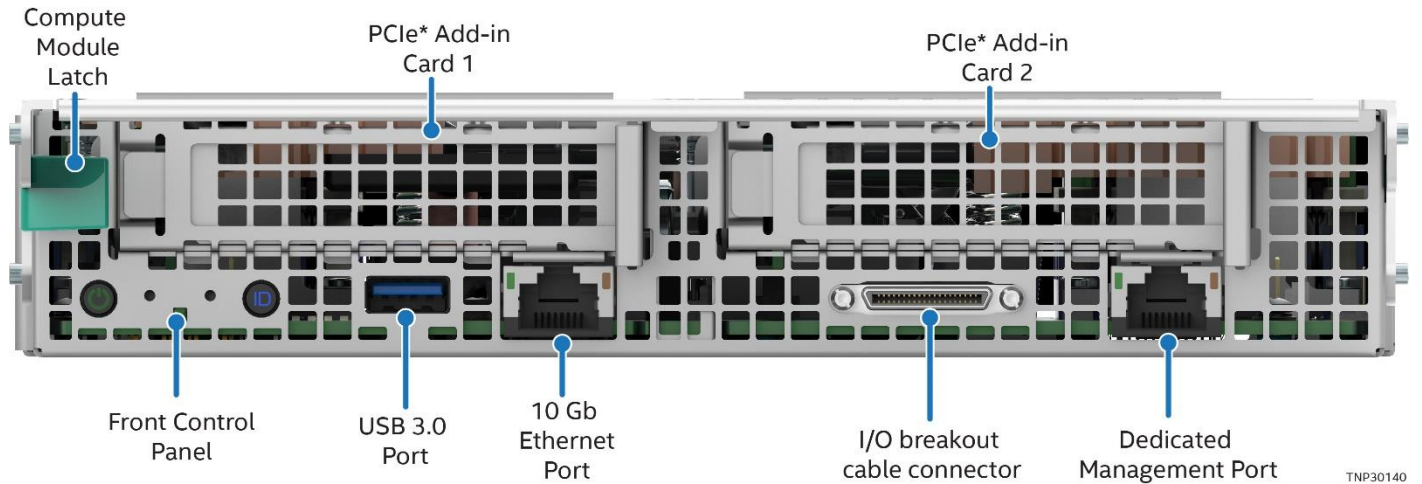


Figure 111. 1U Compute Module Front Panel Feature Identification

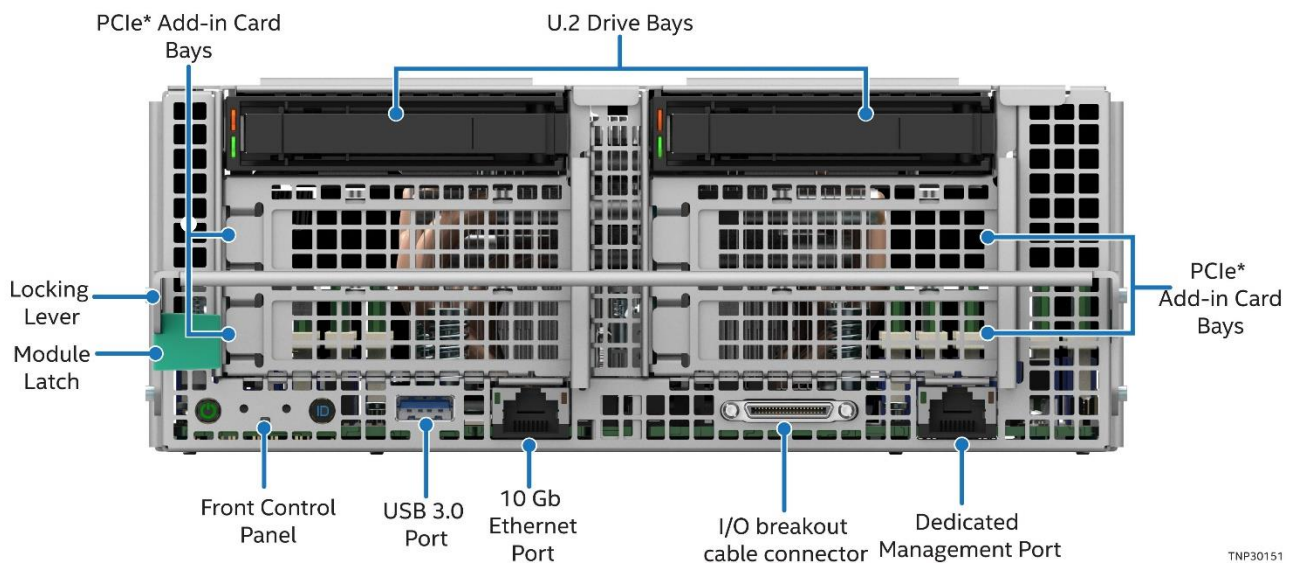


Figure 112. 2U Management Module Front Panel Feature Identification

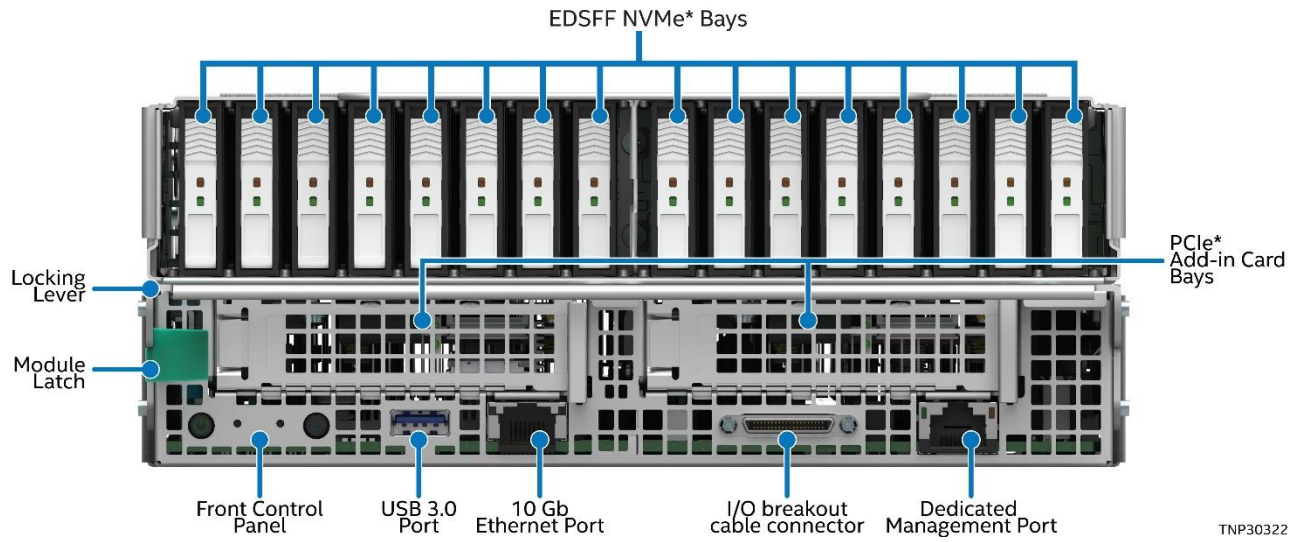


Figure 113. 2U Storage Module Front Panel Feature Identification

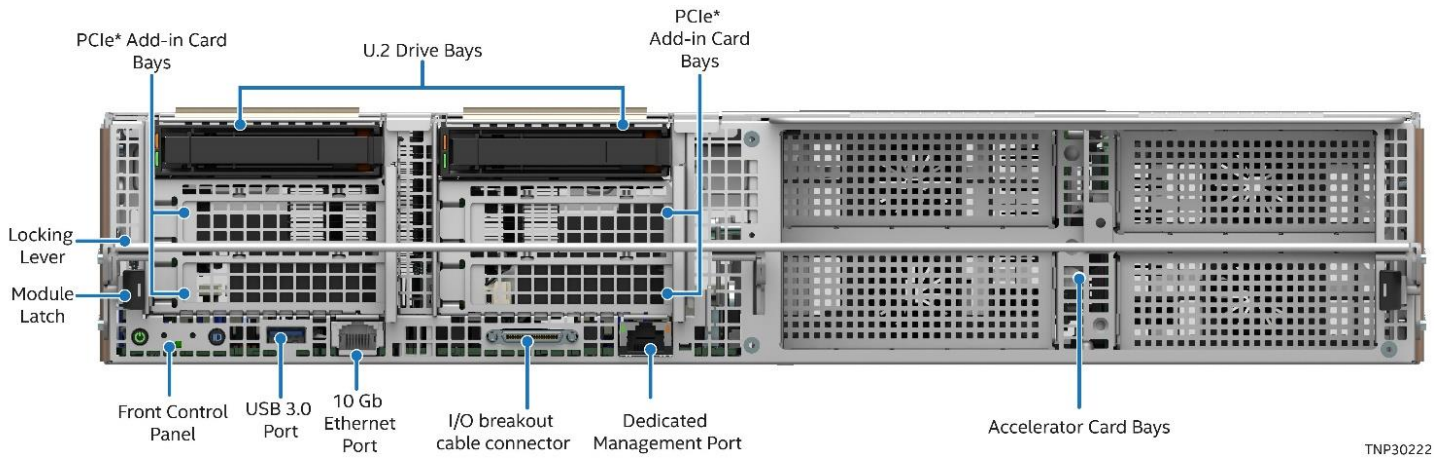


Figure 114. 2U Accelerator Module Front Panel Feature Identification

6.3 Front Control Panel Features

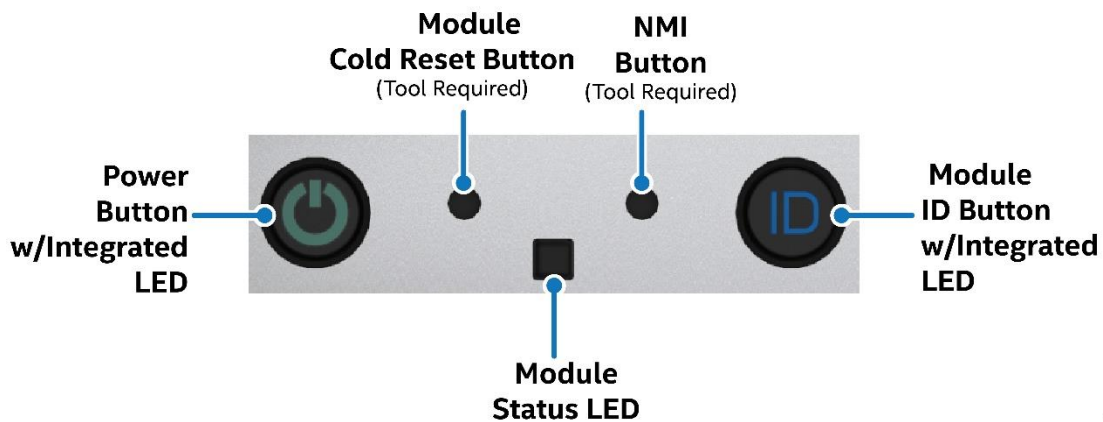


Figure 115. Front Control Panel Features

TNP2041

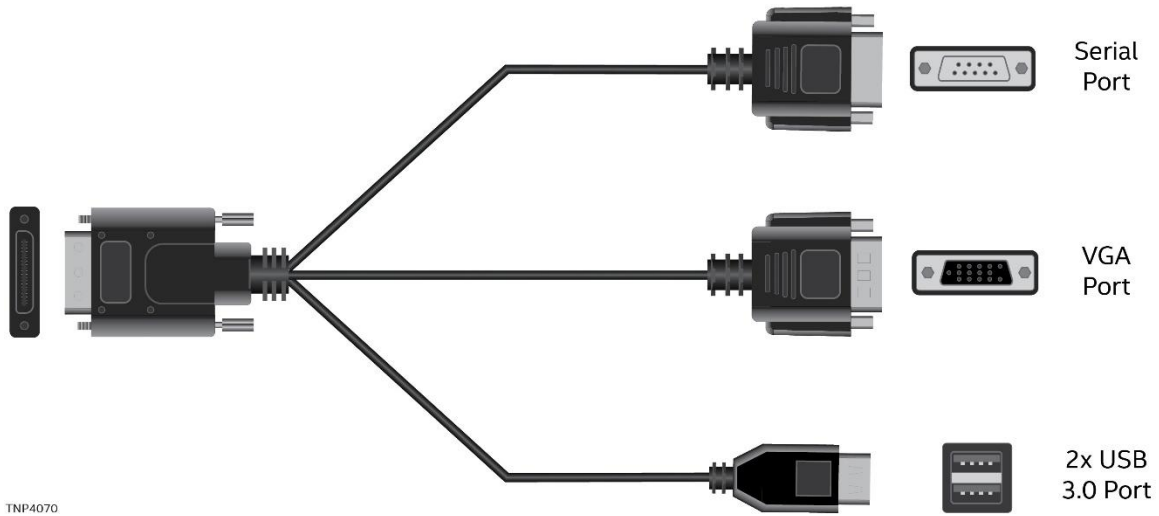


Figure 116. I/O Breakout Cable Connector Identification

6.4 System Component Identification

The following illustrations provide a quick reference to identify system components.

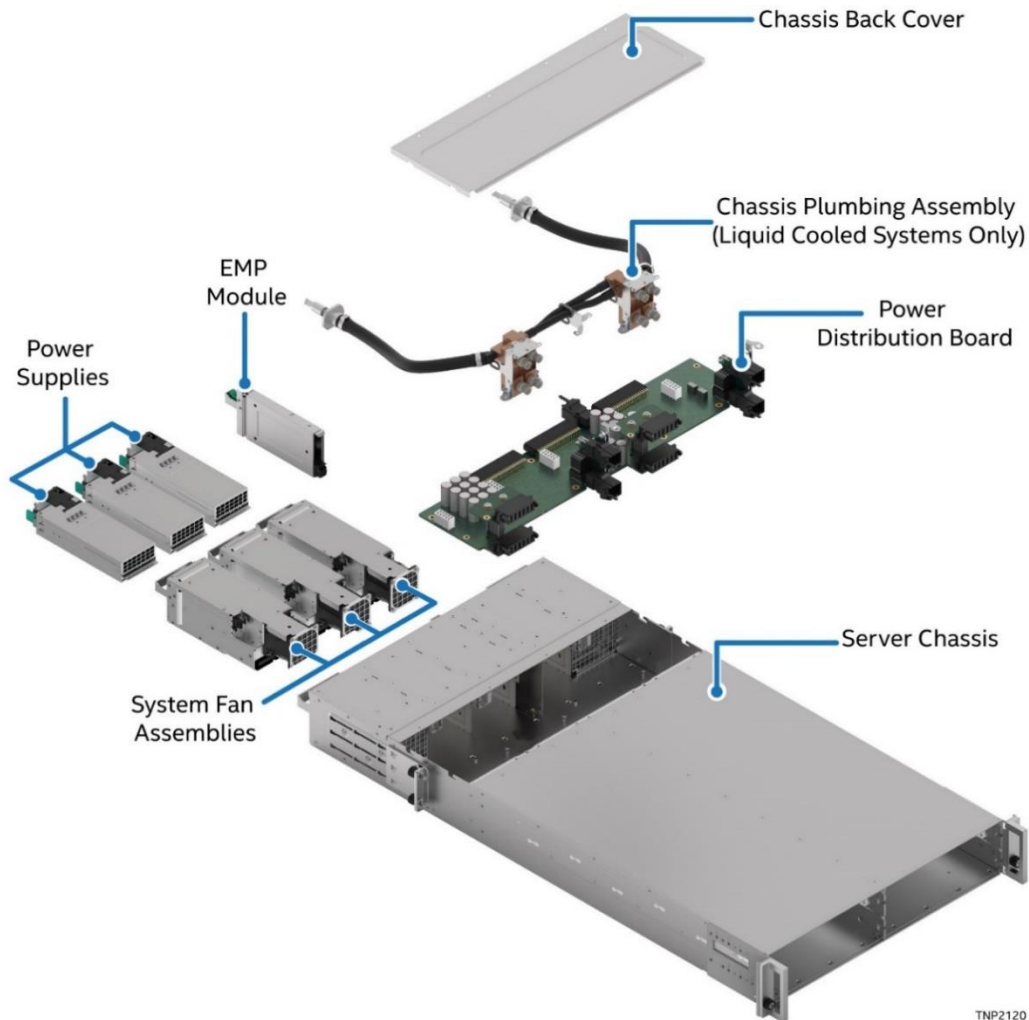


Figure 117. Server Chassis Component Identification

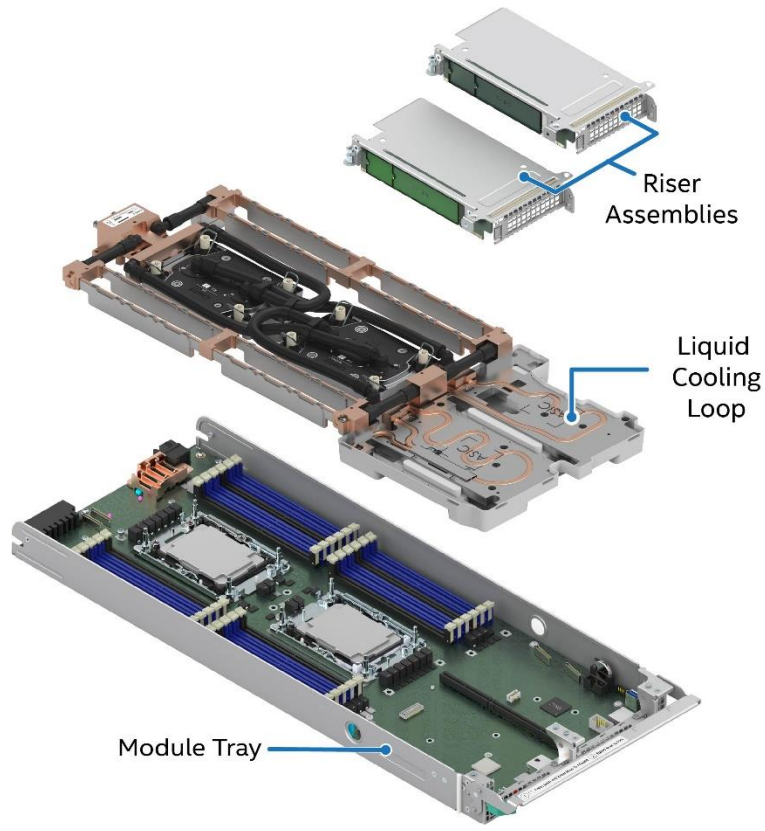


Figure 118. 1U liquid-Cooled Compute Module Component Identification

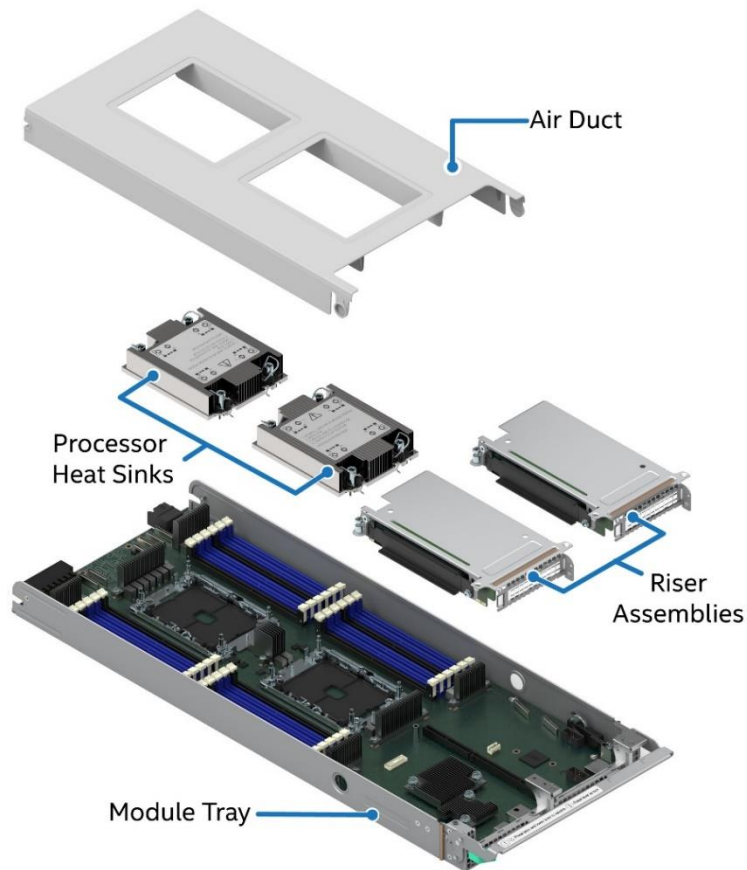


Figure 119. 1U air-Cooled Compute Module Component Identification

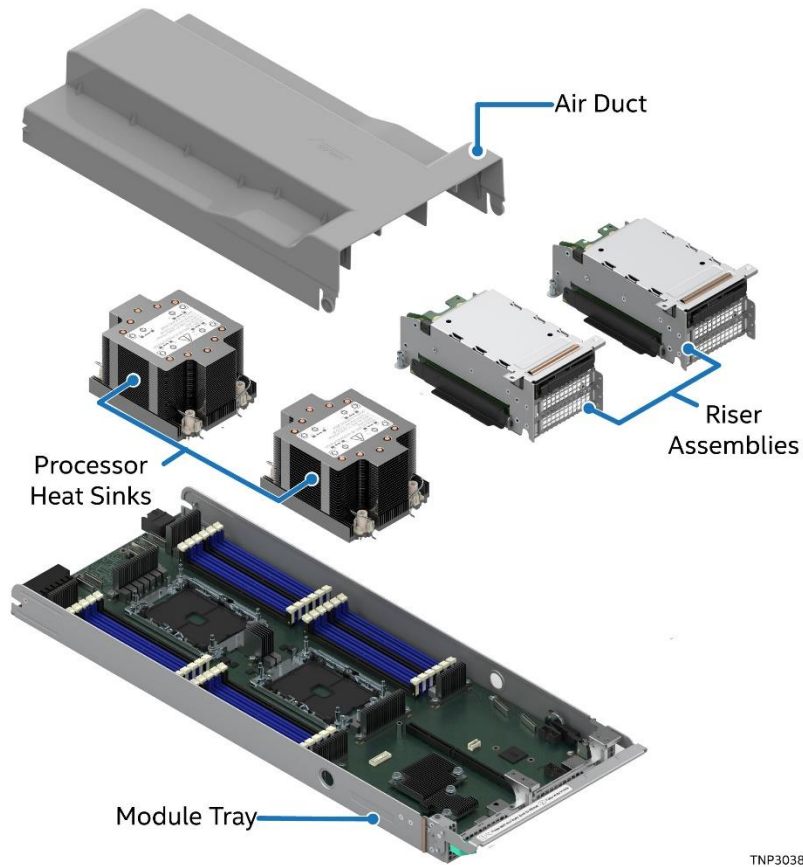


Figure 120. 2U Management Module Component Identification

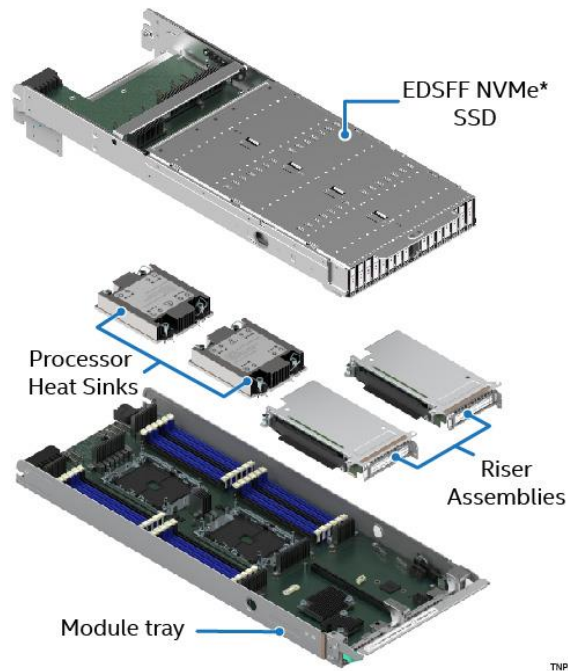


Figure 121. 2U Storage Module Component Identification

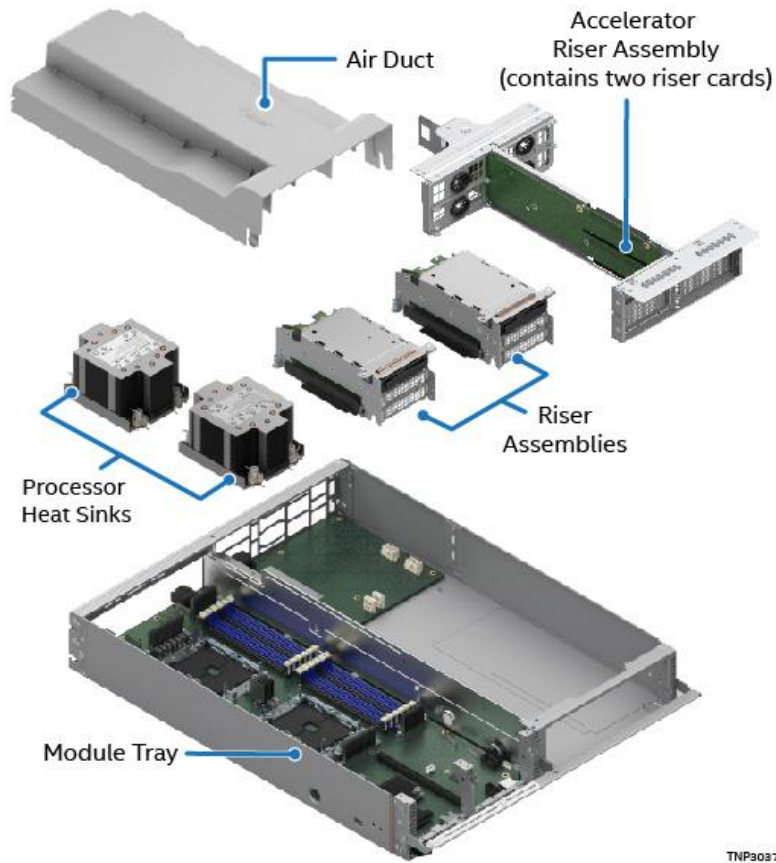


Figure 122. 2U Accelerator Module Component Identification

6.5 Server Board Features

The following figures provide a general overview of the physical server boards, identifying key features and component locations.

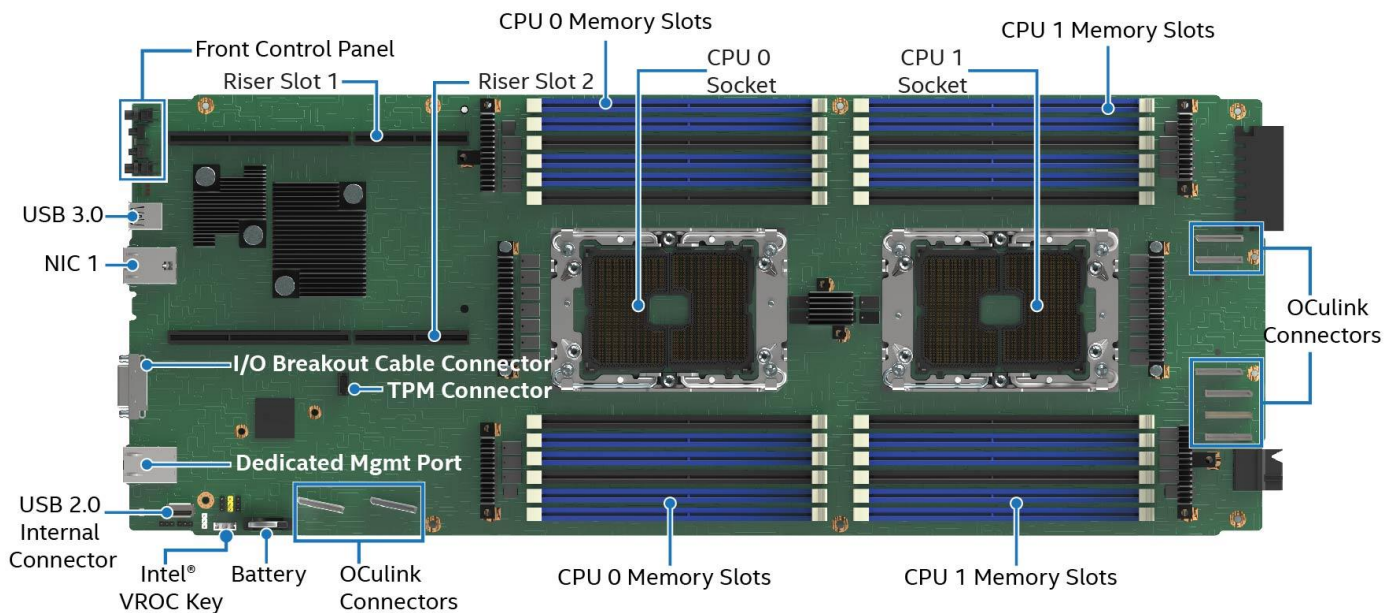
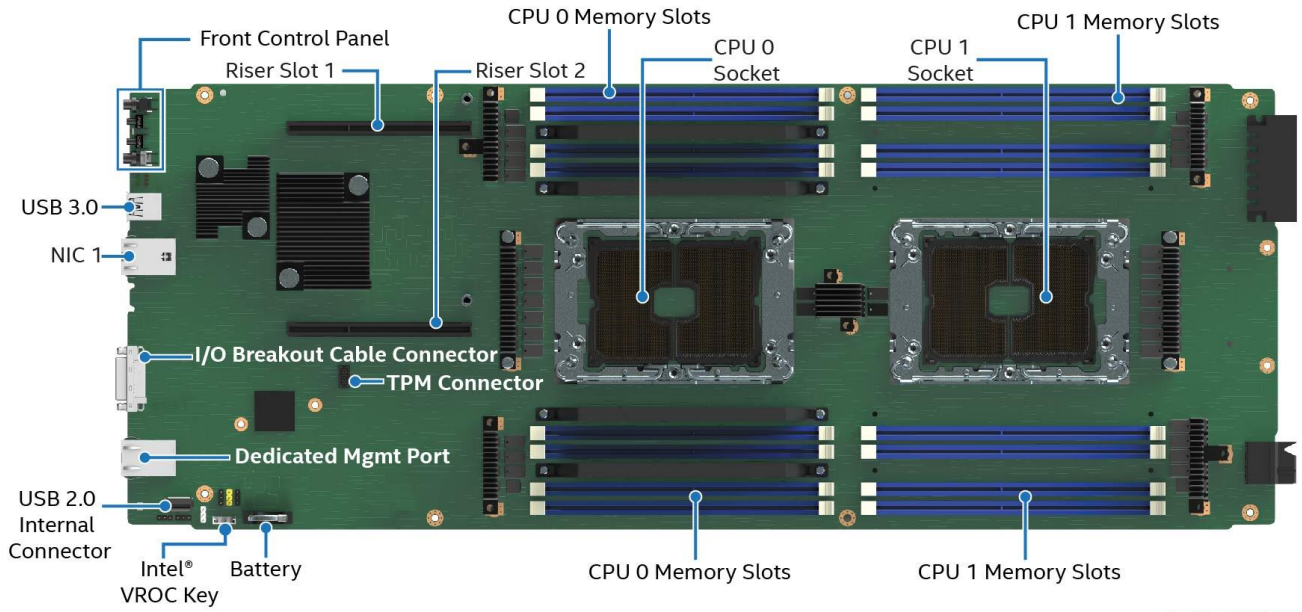


Figure 123. Intel® Server Board D50TNP1SB Feature Identification

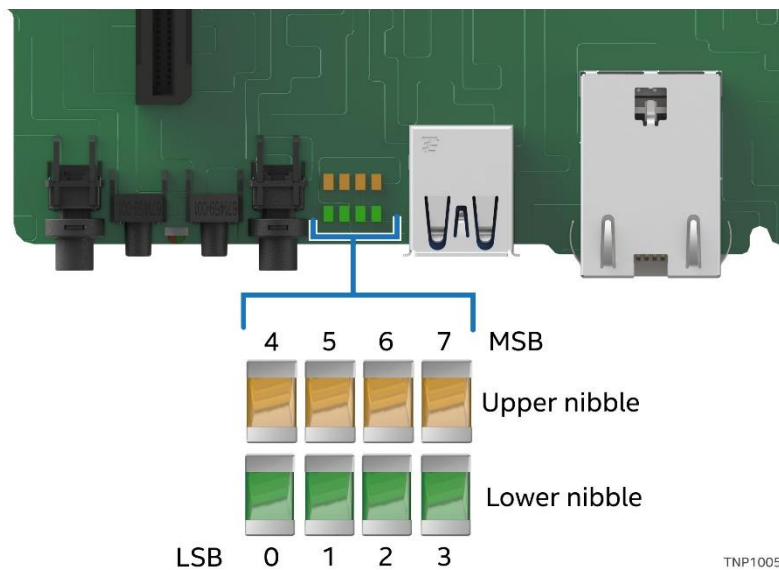


Ref #: TNPI0152

Figure 124. Intel® Server Board D50TNP1SBCR Feature Identification

The Intel Server Boards D50TNP1SB and D50TNP1SBCR include several jumper blocks to configure, protect, or recover specific features of the server board. Refer to [Appendix D](#) for details.

A bank of eight POST code diagnostic LEDs are on the front edge of the server board (see following figure). During the module boot process, the BIOS executes many module configuration steps, each of which is assigned a specific hex POST code number. As each configuration step is started, the BIOS displays the given POST code to the POST code diagnostic LEDs. The purpose of these LEDs is to assist in troubleshooting a system hang condition during the POST process. The diagnostic LEDs can be used to identify the last POST process to be executed. See [Appendix C](#) for a complete description of how these LEDs are read, and for a list of all supported POST codes.



TNP10052

Figure 125. Onboard LED Location

7. FRU Replacement

This chapter provides instructions for replacement of system components considered to be field replaceable (FRU). The Intel® Server D50TNP Family features a modular design. This design allows for servicing of modules, system fans, power supply (in 2 + 1 power supply redundant configuration only), and Ethernet Management Port module (EMP module) without having to power off the entire system.

System components that do require the full system be powered off and AC power cords disconnected from the system include the following:

For air-cooled configurations:

- Power distribution board

For liquid-cooled configurations:

- Power distribution board
- Chassis plumbing assembly

When service is necessary for any of the individual modules within the server system, it is necessary to power off the selected module before removing it from the server chassis.

Before You Begin

Before integration of any system components, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

System Reference

In the following procedures, all references to left, right, front, top, and bottom assume that the reader is facing the front of the chassis and the front of a module.

Instruction Format


Each procedure described in this chapter follows an illustration first format. This format gives the reader the option to follow a quicker path to component integration by first seeing an illustration of the intended procedure. If necessary, the reader can then follow the step-by-step instructions that accompany each procedure.

7.1 Module Removal / Installation

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

7.1.1 Module Removal

1. Power down the module using the power button  on the front panel of the module to be replaced.

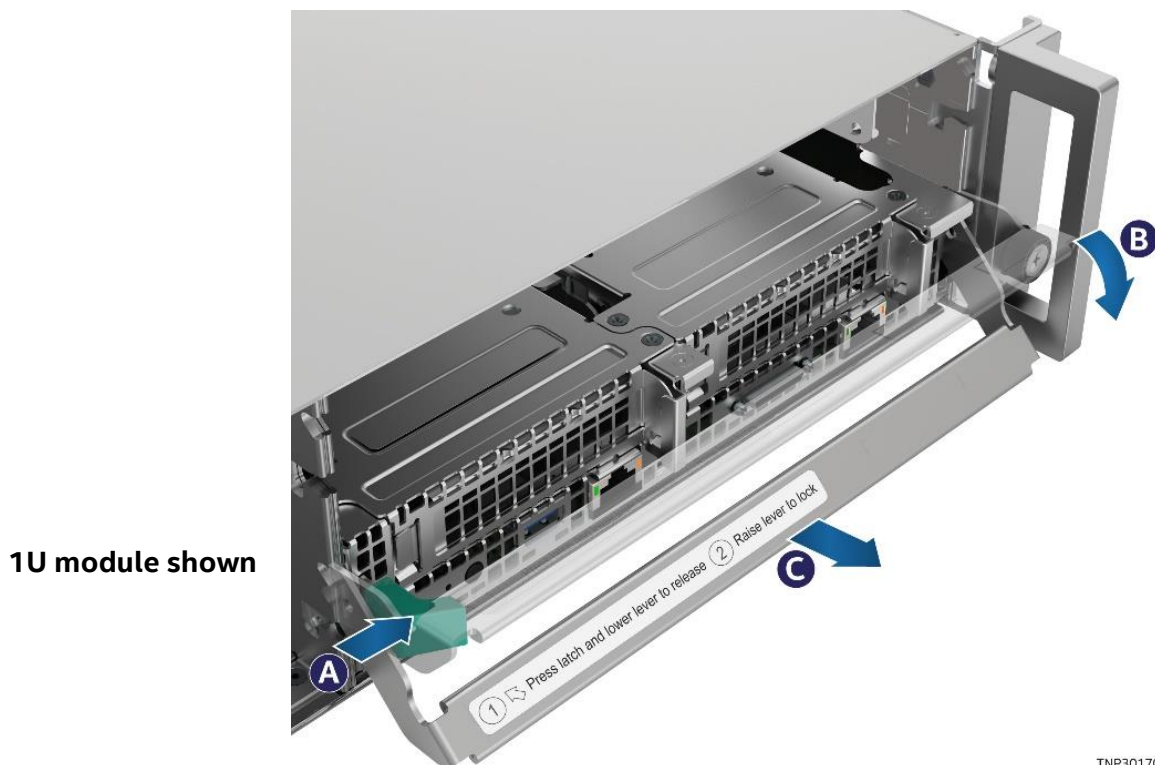


Figure 126. Removing a Module

2. Press the green latch inward (see Letter A) and lower the lever in front of the module (see Letter B).
3. Grasp the lever and pull out the module from the chassis (see Letter C).

Note: To keep the system operating within its thermal limits, module bays must be populated with either a module or blank when any of the installed modules are operational.

7.1.2 Module Installation

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

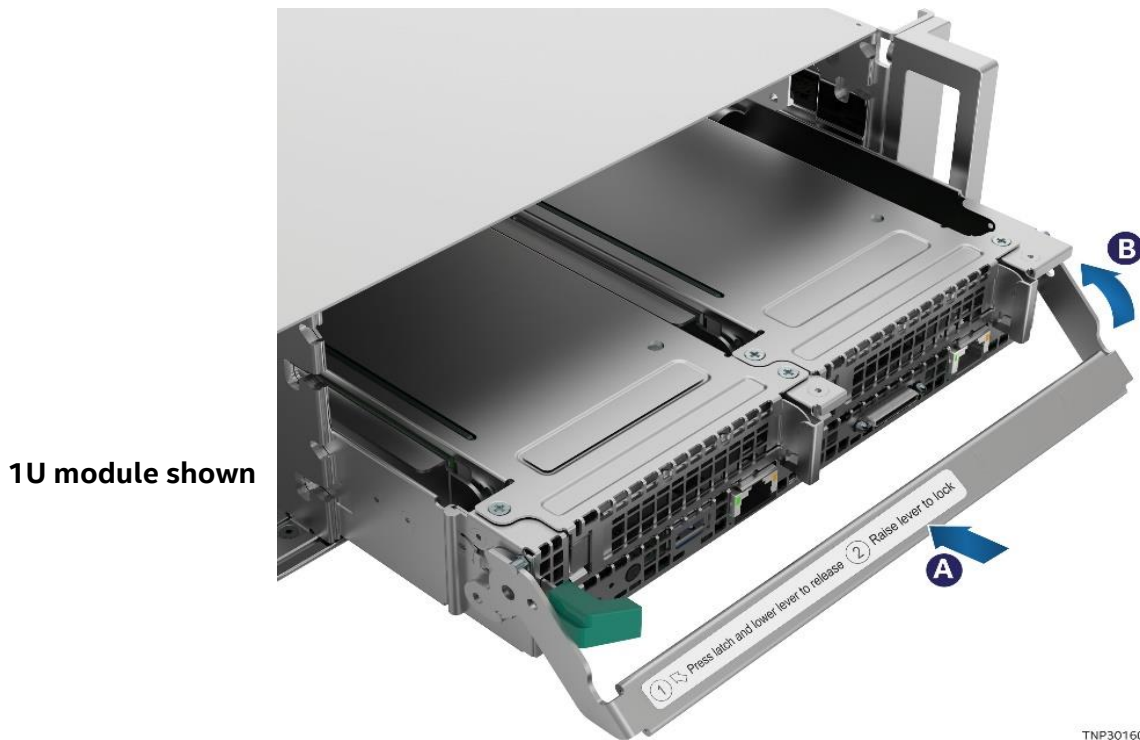


Figure 127. Installing a Module

1. Ensure that the lever in front of the module is lowered. If not, press the green latch inward and lower the lever (see Letter A).
2. Align the module to its corresponding bay and push it into the chassis until the key pins in the lever are inside the chassis inner wall key hole.
3. Raise the lever to secure the module (see Letter B).

7.1.2.1 Storage Module Installation (iPC D50TNP2MHSTAC Only)

Important Note: When installing an Intel® Storage Module in the chassis for the very first time, the internal chassis rails need to be removed.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

TNP41390

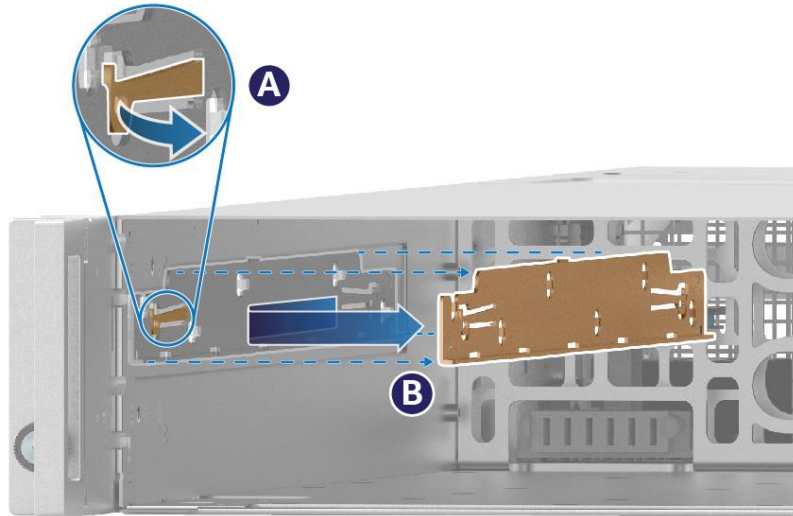


Figure 128. Removing the Internal Chassis Rail

1. Locate the internal rails in the upper part of the inner wall, both sides of the chassis.
2. Release the rail latch (see Letter A).
3. Slide the rail towards the front of the chassis to remove it (see Letter B).

Do not reinstall the internal chassis rails if the chassis is used only for the Intel® Storage Module. For any other type of module installation, the internal chassis rails need to be reinstalled. Follow the instructions below to reinstall the internal chassis rails.

TNP41400

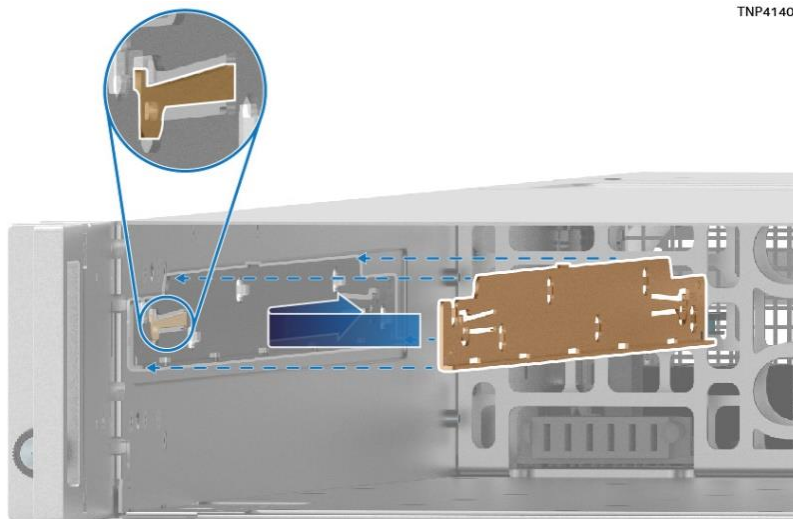


Figure 129. Installing the Internal Chassis Rail

4. Place the new rail inside the chassis, aligning the keying pins of the rail with the chassis inner wall.
5. Slide the rail into the chassis inner wall towards the back of the chassis until it locks into place.

7.2 Air Duct Removal / Installation

To maintain system thermals, the air duct must always be in place when the system is operational. Removal of the air duct is necessary when installing or replacing any system component within the module.

The figures below show the air duct for D50TNP1MHCPAC. However, the steps of air duct removal and installation in this section apply to D50TNP1MHCPAC, D50TNP1MHCRCAC, D50TNP2MHSVAC, and D50TNP2MFALAC.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

7.2.1 Air Duct Removal

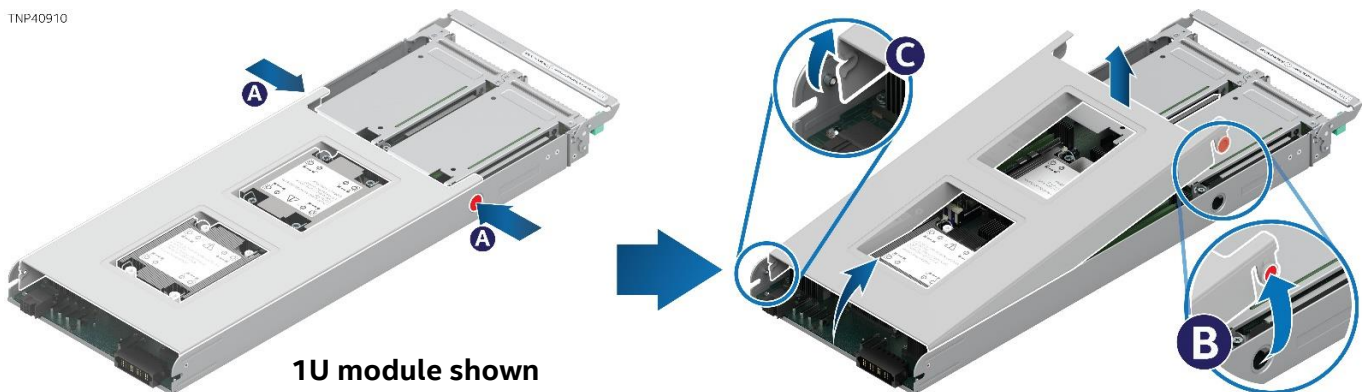


Figure 130. Removing the Air Duct

1. Press the latches on both sides of the module inwards (see Letter A).
2. Carefully lift the front edge of the air duct away from the module (see Letter B).
3. Pull the air duct away from the module (see Letter C).

7.2.2 Air Duct Installation

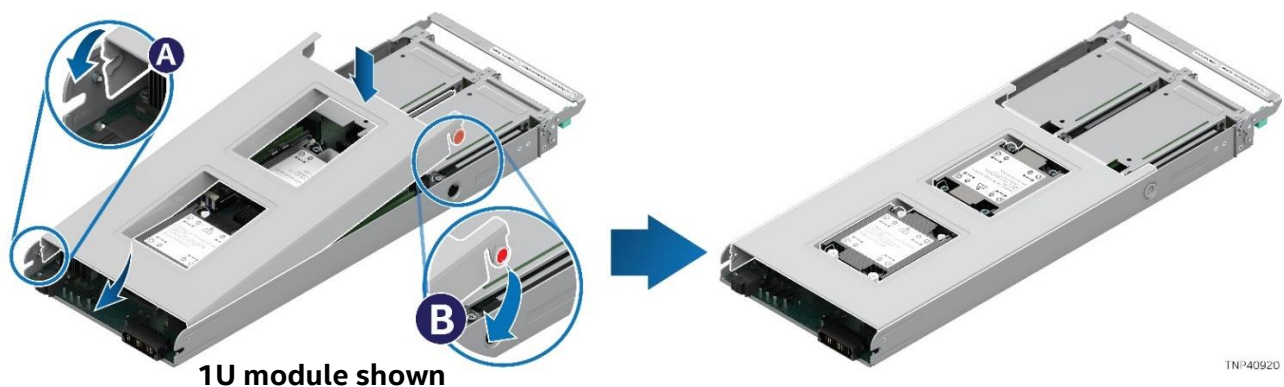


Figure 131. Installing the Air Duct

1. Align and attach the hinge slots on the back end of the air duct with the hinge posts on both sides of the module (see Letter A).
2. Lower the air duct down until both the left and right side latches snap into place (see Letter B).

7.3 Opening and Closing Storage Module (iPC D50TNP2MHSTAC)

The Storage Module top tray contains the enterprise data center SSD form factor (EDSFF) units while the base of the module contains the processors, memory, and add-in cards. This section provides instructions to open and close the top tray of the storage module.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

7.3.1 Opening the Top Tray

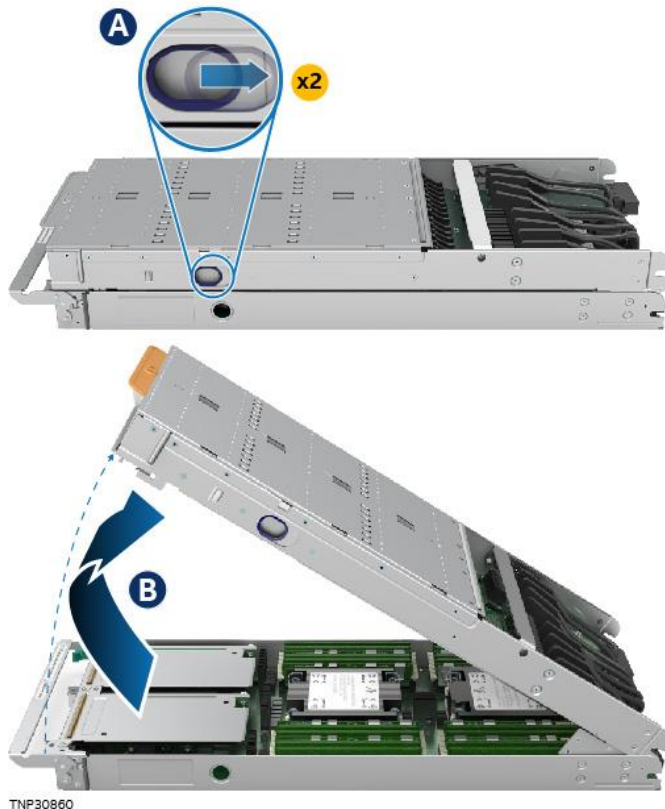


Figure 132. Removing the Air Duct

1. Unlock the latches on both sides of the top tray (see Letter A).
2. Lift the front edge of the top tray slowly until the lock clicks (see Letter B).

7.3.2 Closing the Top Tray

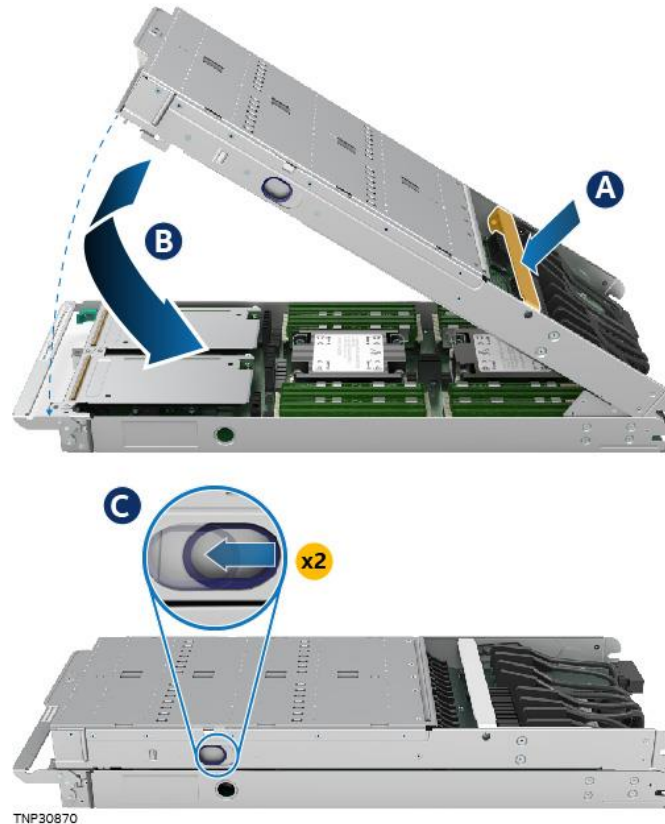


Figure 133. Removing the Air Duct

1. Push up the front edge of the top tray just slightly until the lock releases
2. Push the handle bar down (see Letter A) with one hand. Hold the front edge of the top tray with the other hand and lower it (see Letter B).
3. Lock the latches on both sides of the top tray (see Letter C)

7.4 Processor Replacement

7.4.1 Processor Replacement for Standard Air-Cooled Heat Sinks

Components Required for each faulty processor:

- New 3rd Gen Intel® Xeon® Scalable processor + included shipping tray
- Existing processor carrier clip
- Existing processor heat sink + new thermal interface material (TIM)

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- ESD Gloves (recommended)
- T-30 Torx* screwdriver

Note: The installation figures in this section only display the 1U front heat sink. However, the processor installation procedure is the same, regardless of the size of the heat sink.

Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following figure for proper handling.

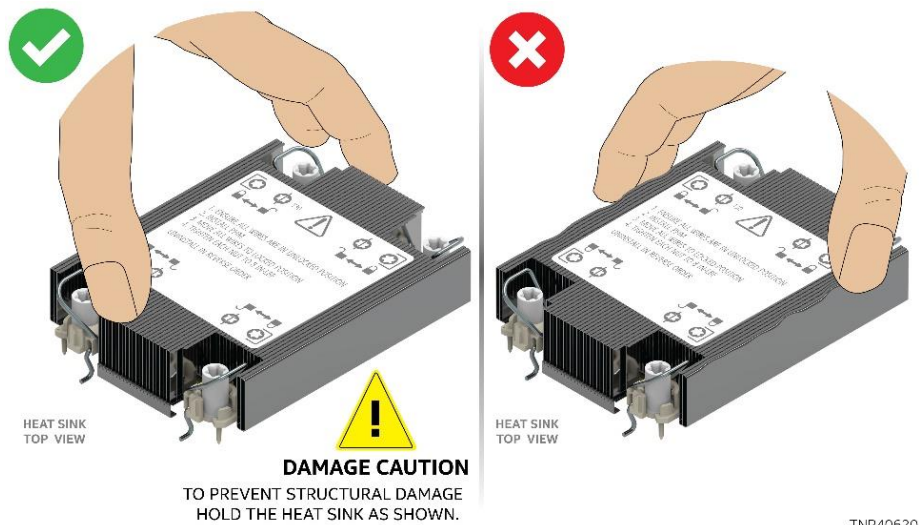


Figure 134. Processor Heat Sink Handling

7.4.1.1 Processor Heat Sink Module (PHM) Removal

1. Identify and locate the faulty processor.

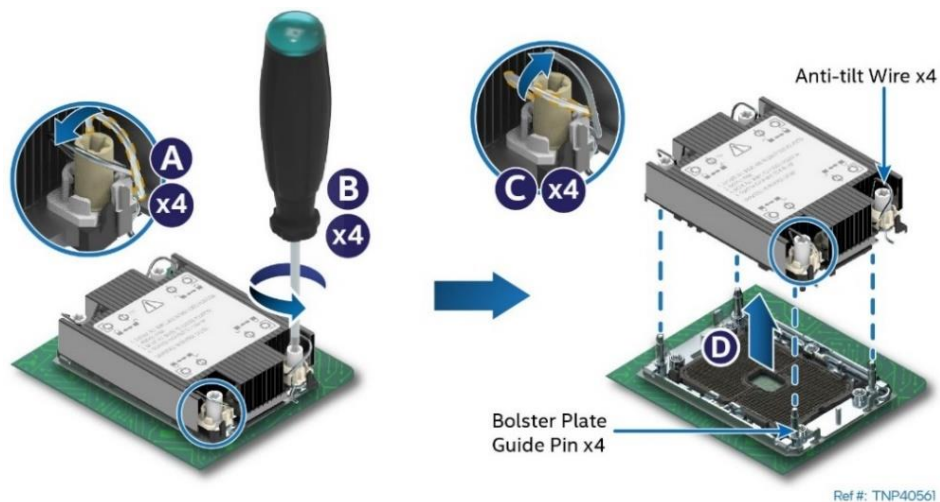


Figure 135. PHM Assembly Removal from Processor Socket

2. Ensure that the heat sink anti-tilt wire located over each of the four heat sink fasteners is in the outward position (see Letter A).
3. Using T-30 Torx* screwdriver, fully loosen all four heat sink fasteners in any order (see Letter B).
4. Set all four anti-tilt wires on the heat sink to the inward position (see Letter C).
5. Carefully grasp the PHM and lift it straight up and off the server board (see Letter D).
6. With the processor facing up, set the PHM down onto a flat surface.
7. Visually inspect that the processor socket is free of damage or contamination.

Caution: If debris is observed, blow it away gently. Do not use tweezers or any other hard tools to remove the debris.

8. If not replacing the processor, install the original plastic socket cover over the processor socket.

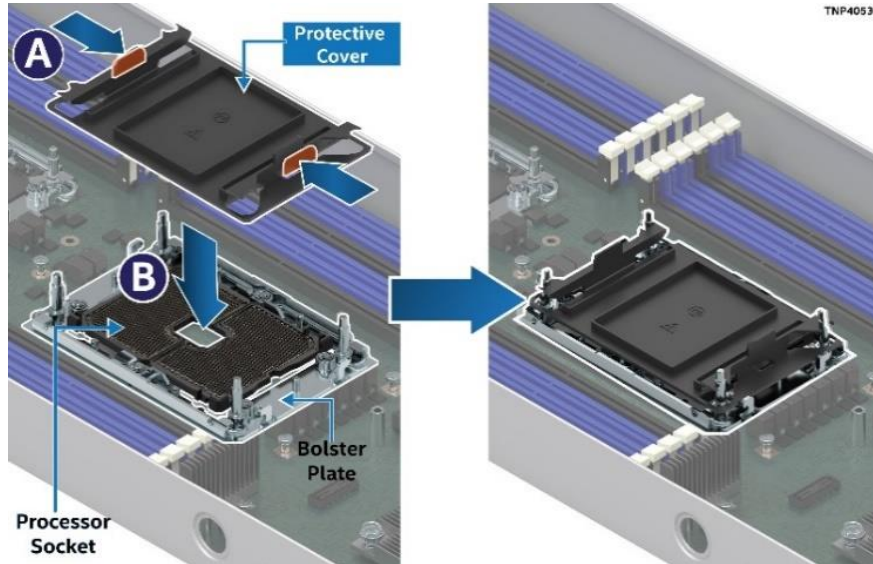


Figure 136. Reinstall the Socket Cover

- Squeeze the finger grips at each end of the cover (see Letter A).
- Carefully lower the cover over the four alignment pins of the bolster plate and onto the processor socket (see Letter B).
- Release finger grips to lock the cover in place.
- Ensure that the socket cover is locked in place.

Caution: Do not press down on the center of the socket cover.

7.4.1.2 PHM Disassembly

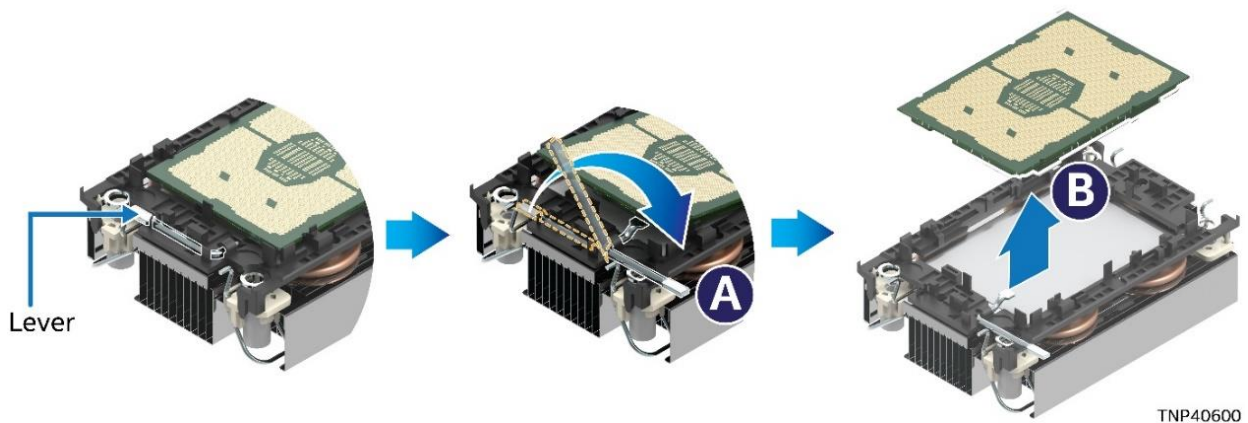
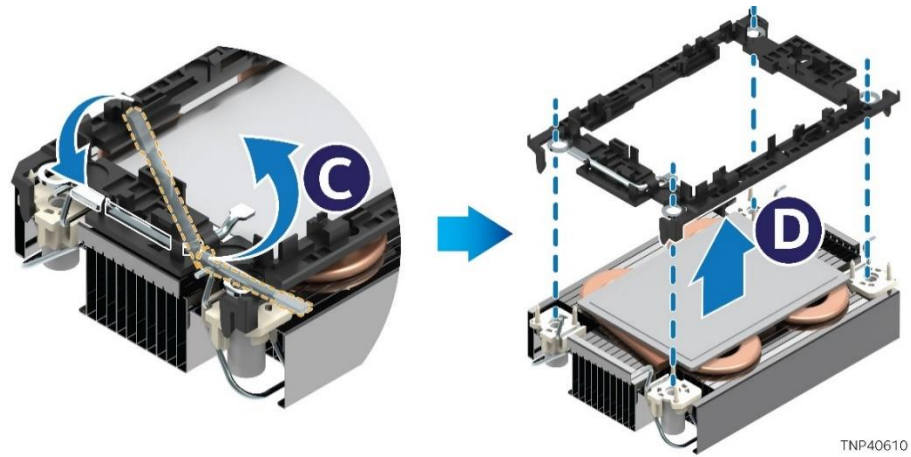


Figure 137. Processor Removal from PHM Assembly

1. While holding down the PHM, rotate the lever (see Letter A) from left to right until the processor lifts free from the processor carrier clip.
2. Holding down the processor carrier clip, carefully lift the processor and slide it out of the processor carrier clip (see Letter B).



TNP40610

Figure 138. Processor Carrier Clip Removal from PHM Assembly

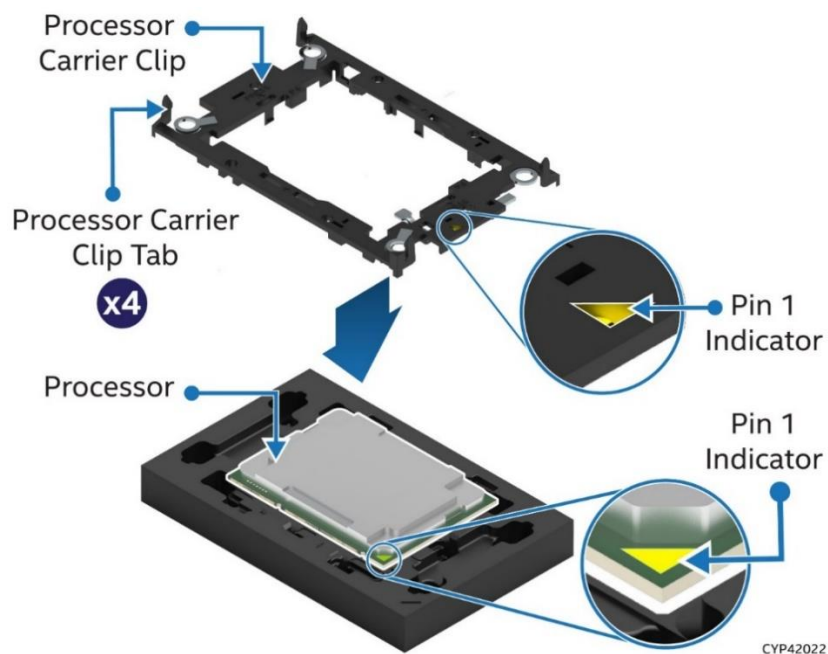
3. Return the lever to the original position (see Letter C).
4. Detach the processor carrier clip from the heat sink.
 - Unlatch the hook on each corner of the processor carrier clip and lift it from the heat sink (see Letter D).

7.4.1.3 PHM Reassembly

To properly reassemble the PHM and install it onto the server board, the procedures described in the following sections must be followed in the order specified. These instructions assume that the processor heat sink (new or reuse of existing) has the necessary Thermal Interface Material (TIM) (Honeywell* PTM7000) already applied to the bottom of the heat sink.

Caution: Full ESD precautions should be followed to perform reassembly of the PHM and reinstallation of the PHM to the server board. The processor itself should Not be handled.

Each component within the PHM assembly includes a Pin 1 indicator. Pin 1 indicator alignment between all components is required throughout the assembly process.



CYP42022

Figure 139. Installing Processor Carrier Clip onto Processor – Part 1

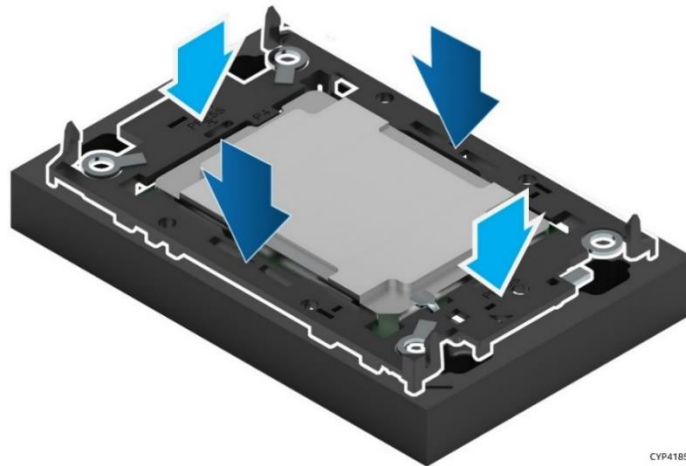


Figure 140. Installing Processor Carrier Clip onto Processor – Part 2

1. With the processor still in its tray, place the processor carrier clip over the processor.
2. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.
3. Gently press down simultaneously on two opposite sides of the processor carrier clip until it clicks in place.
4. Repeat step 3 for the other two sides.
5. Locate the processor heat sink. To avoid damage, grasp it by its narrower sides as shown below.

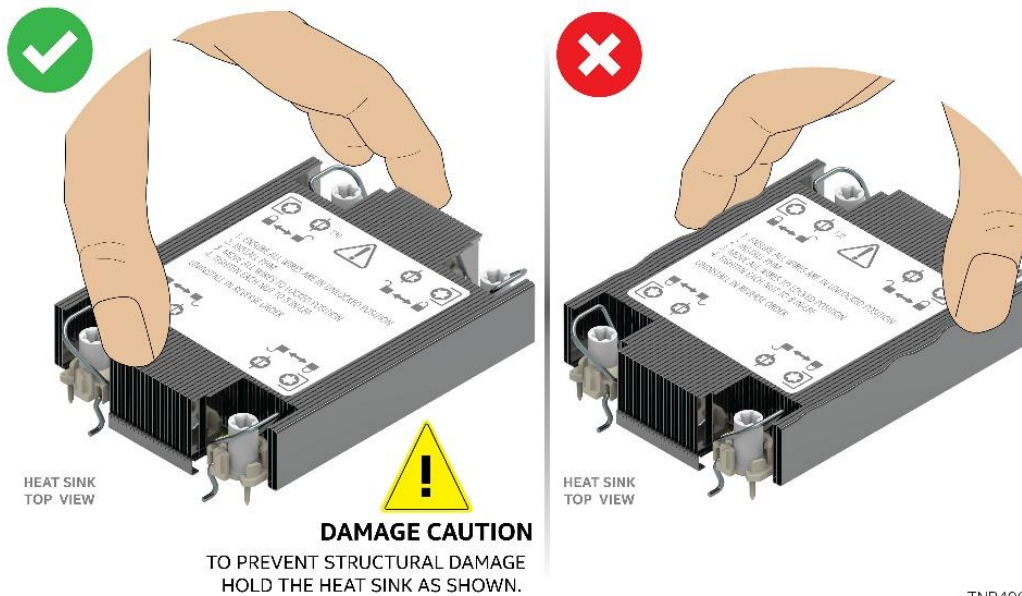


Figure 141. Processor Heat Sink Handling

6. Place the heat sink bottom side up onto a flat surface.

If reusing an existing heat sink

- Properly clean off existing thermal interface material (TIM) from the bottom of the heat sink
- Apply new TIM (Honeywell* PTM7000)

If using a new heat sink

- Remove the plastic protective film (if present) from the Thermal Interface Material (TIM).

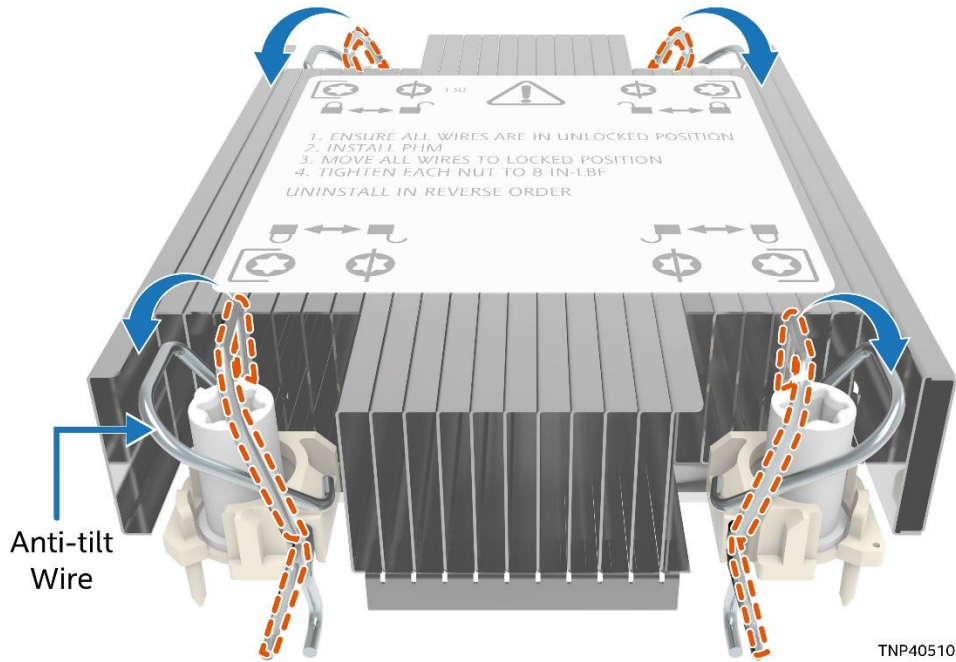


Figure 142. Processor Heat Sink Anti-tilt Wires in the Outward Position

7. Set the anti-tilt wire over each of the four heat sink fasteners to their outward position.

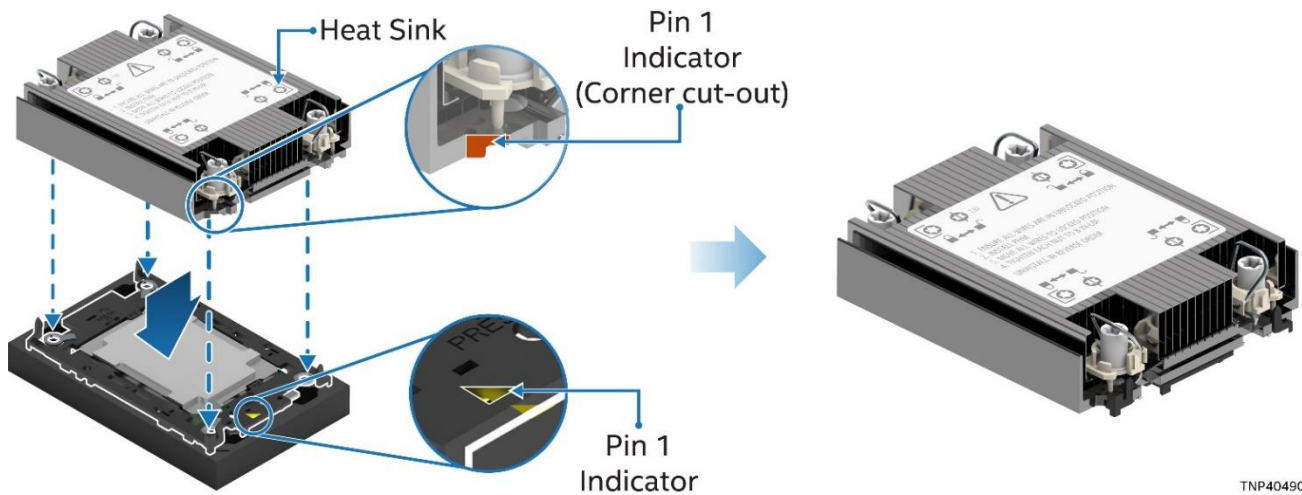


Figure 143. Pin 1 Indicator of Processor Carrier Clip

8. Align the Pin 1 indicator of processor carrier clip with one of the diagonally cut corners on the base of the heat sink. Or (if present) look for the Pin 1 indicator on the corner of the heat sink label.
9. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
10. Ensure that all four heat sink corners are securely latched to the processor carrier clip tabs.

7.4.1.4 PHM Installation

1. If installed, remove the plastic cover from the processor socket.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

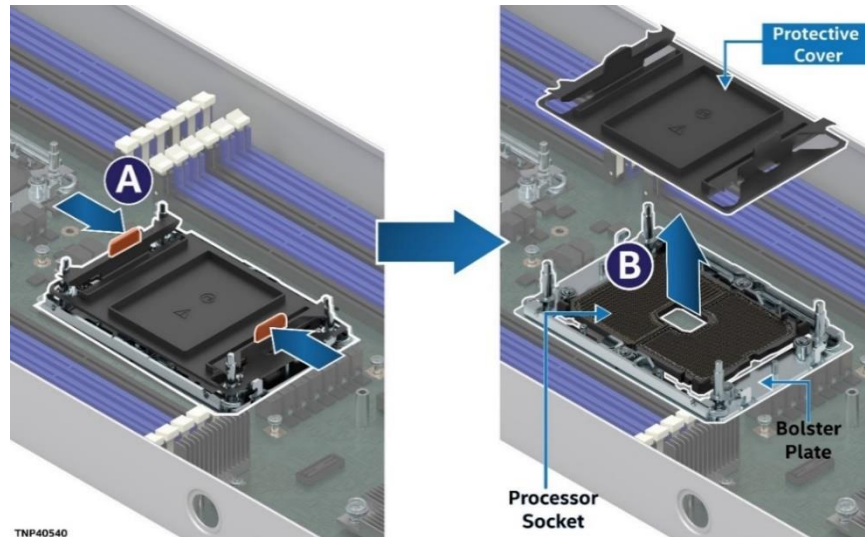


Figure 144. Socket Protective Cover Removal

2. Remove the protective cover by squeezing the finger grips (see Letter A) and pulling the cover up (see Letter B).
3. Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

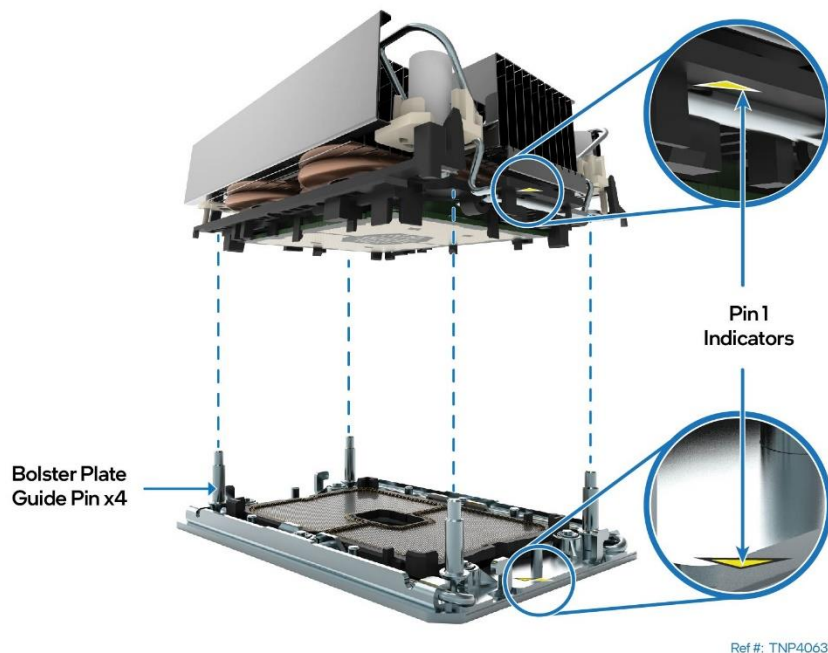
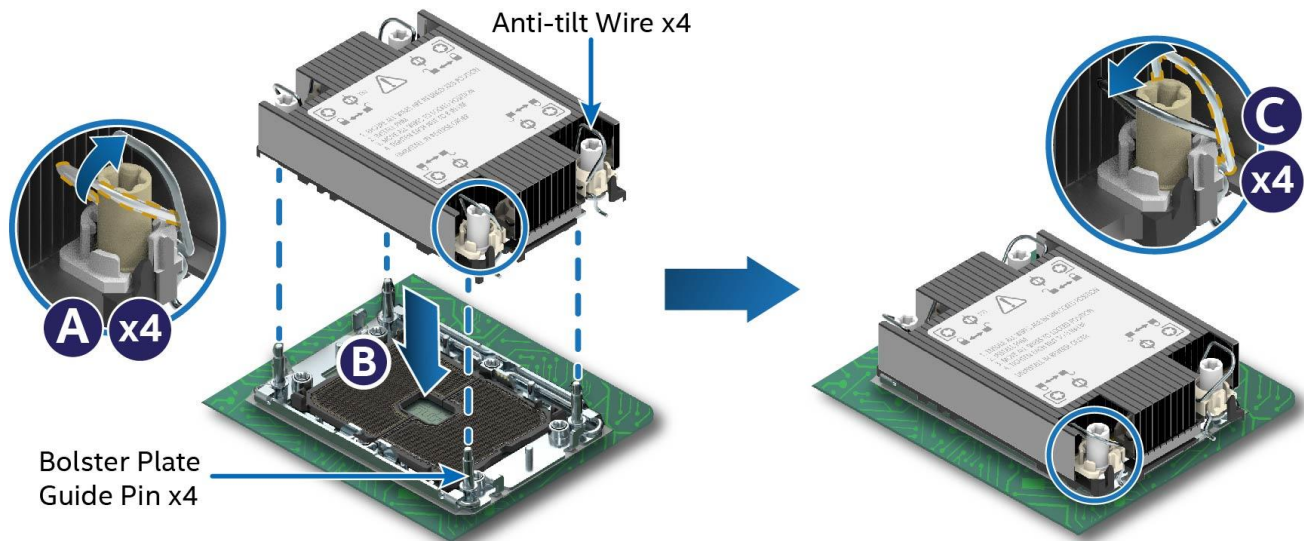


Figure 145. PHM Alignment with Socket Assembly

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.



Ref #: TNP40551

Figure 146. PHM Installation onto Server Board

4. Set all four anti-tilt wires on the heat sink to the inward position (see Letter A).
5. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the socket assembly bolster plate.
6. Carefully lower the PHM over the four bolster plate alignment pins (see Letter B).
7. Ensure that the PHM is sitting flat and even on the bolster plate.
8. Set all four anti-tilt wires on the heat sink to the outward position (see Letter C).



Ref #: TNP40571

Figure 147. Tighten Heat Sink Fasteners

9. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb. No specific sequence is needed for tightening.
10. Reinstall the air duct and module (see [Sections 7.2.2](#) and [7.1.2](#)).

Note: Intel strongly recommends that both processors are installed. If only one processor is installed, do not install a processor heat sink on an empty socket.

7.4.2 Processor Replacement for EVAC Heat Sinks

Components Required for each faulty processor:

- New 3rd Gen Intel® Xeon® Scalable processor + included shipping tray
- Existing processor carrier clip
- Existing 1U EVAC processor heat sink + new thermal interface material (TIM)

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- ESD Gloves (recommended)
- T-30 Torx* screwdriver
- Phillips* head screwdriver #2

Note: The procedures below show the replacement for the 1U EVAC processor heat sink (front). To replace the 1U standard processor heat sink (back), follow the procedures in [Section 7.4.1](#).

Caution: Fin edges of the processor heat sink are very sharp. Intel recommends wearing thin ESD protective gloves when handling the PHM during the following procedures.

Caution: Processor heat sinks are easily damaged if handled improperly. See the following image for proper handling.

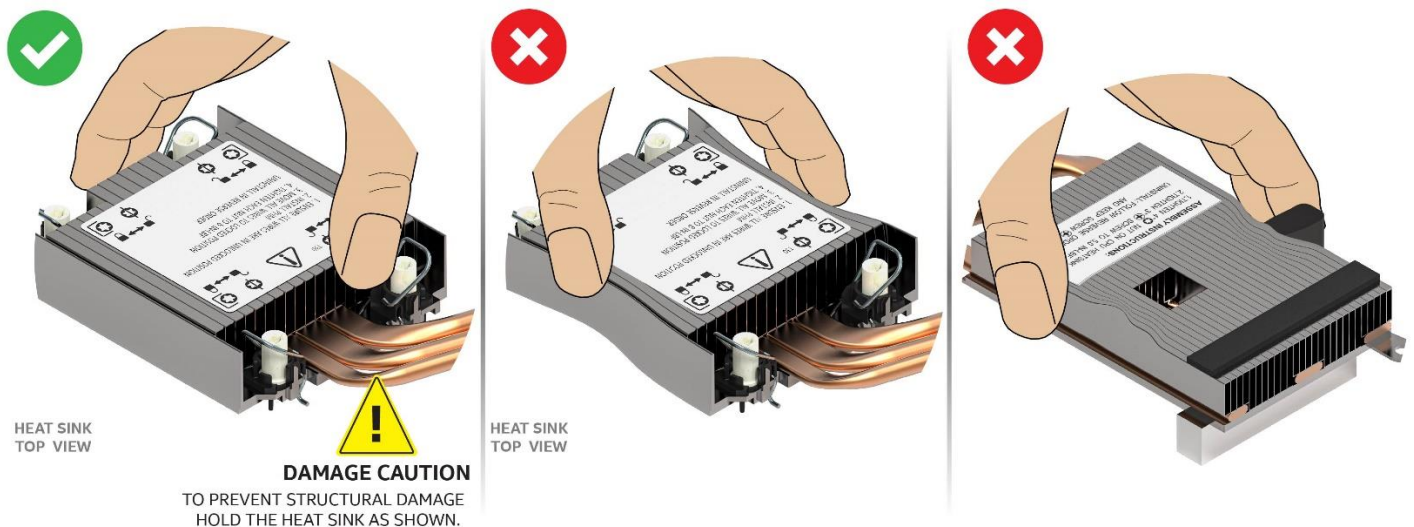
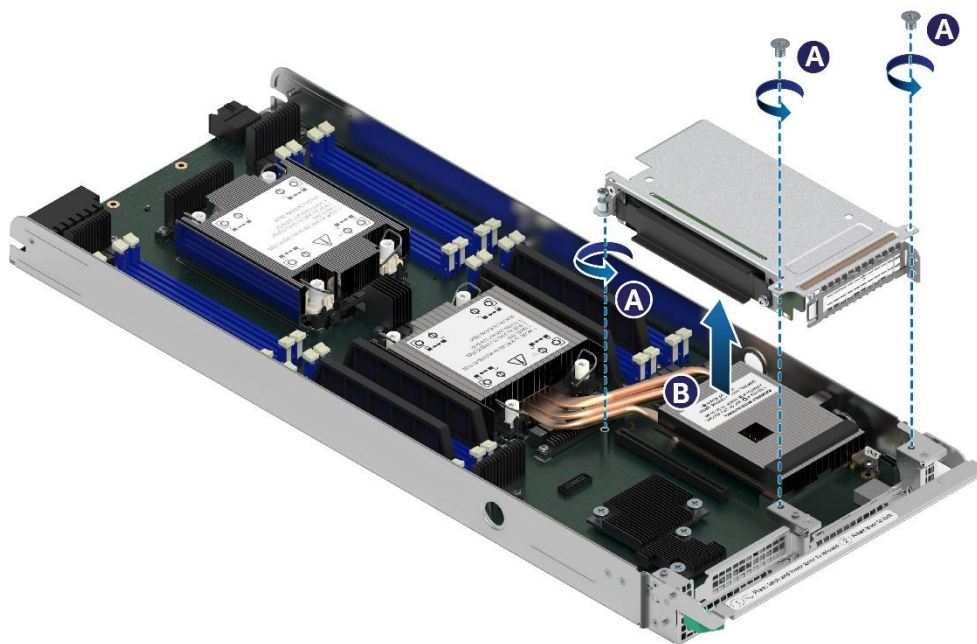


Figure 148. Processor Heat Sink Handling

7.4.2.1 Processor Heat Sink Module (PHM) Removal

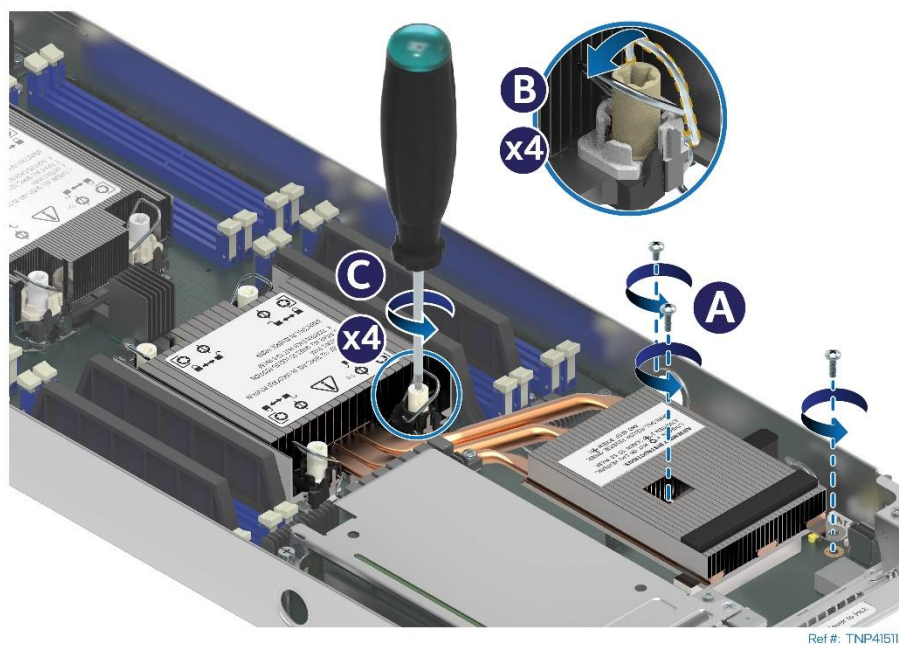
1. Remove the riser assembly on the right side of the module.



Ref #: TNP41590

Figure 149. Removing a Riser Assembly

- Remove the three screws that secure the riser assembly to the module (see Letter A).
- Carefully remove the riser assembly by lifting it up away from the module (see Letter B).



Ref #: TNP41511

Figure 150. Loosen EVAC Heat Sink Fasteners

2. Using a Phillips screwdriver, fully loosen the heat sink extension screws (see Letter A).
3. Ensure that the heat sink anti-tilt wire located over each of the four heat sink fasteners is in the outward position (see Letter B).

4. Using T-30 Torx* screwdriver, fully loosen all four heat sink fasteners on the PHM in any order (see Letter C).

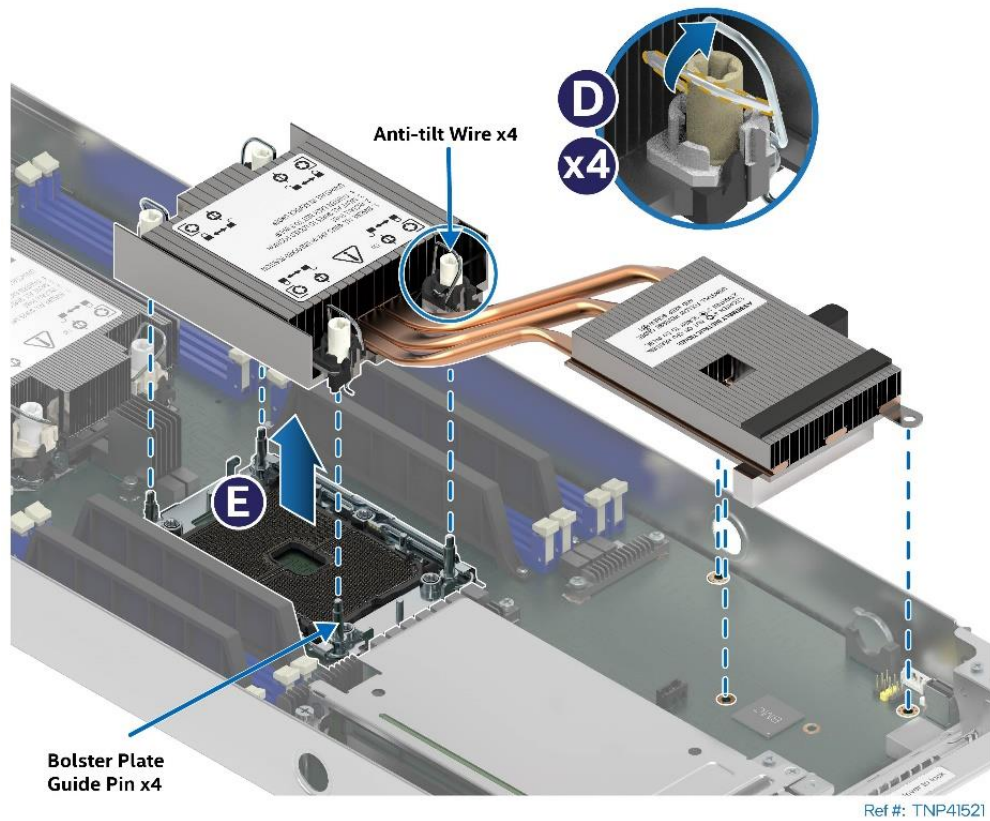


Figure 151. PHM Assembly Removal from Processor Socket

5. Set all four anti-tilt wires on the heat sink to the inward position (see Letter D).
6. Carefully grasp the PHM and lift it straight up and off the server board (see Letter E).
7. With the processor facing up, set the PHM down onto a flat surface.
8. Visually inspect that the processor socket is free of damage or contamination.

Caution: If debris is observed, blow it away gently. Do not use tweezers or any other hard tools to remove the debris.

9. If not replacing the processor, install the original plastic socket cover over the processor socket.

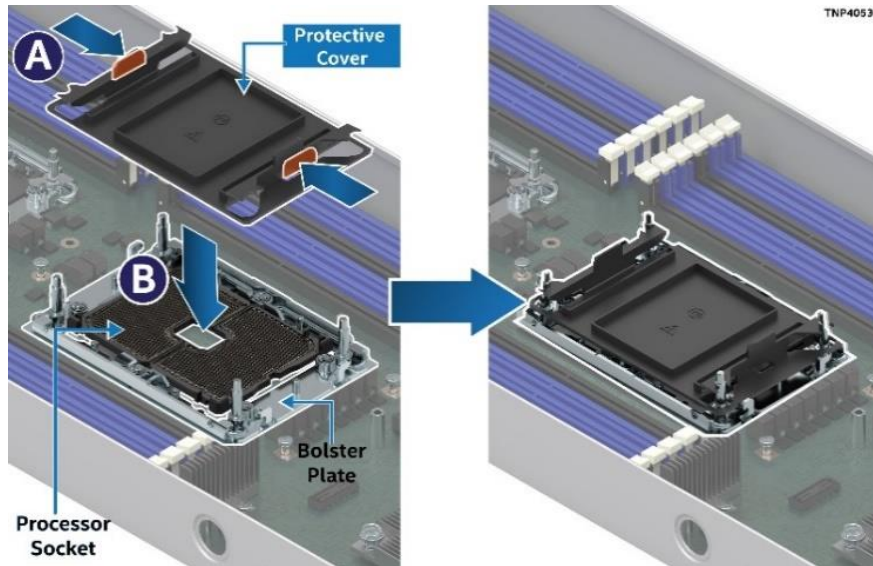


Figure 152. Reinstall the Socket Cover

- Squeeze the finger grips at each end of the cover (see Letter A).
- Carefully lower the cover over the four alignment pins of the bolster plate and onto the processor socket (see Letter B).
- Release finger grips to lock the cover in place.
- Ensure that the socket cover is locked in place.

Caution: Do not press down on the center of the socket cover.

7.4.2.2 PHM Disassembly

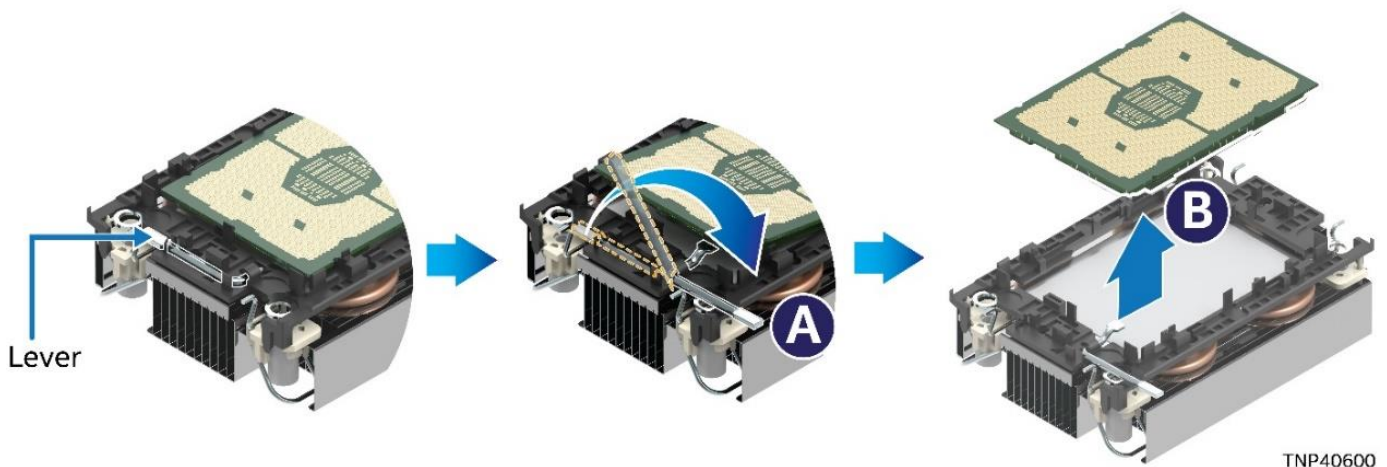
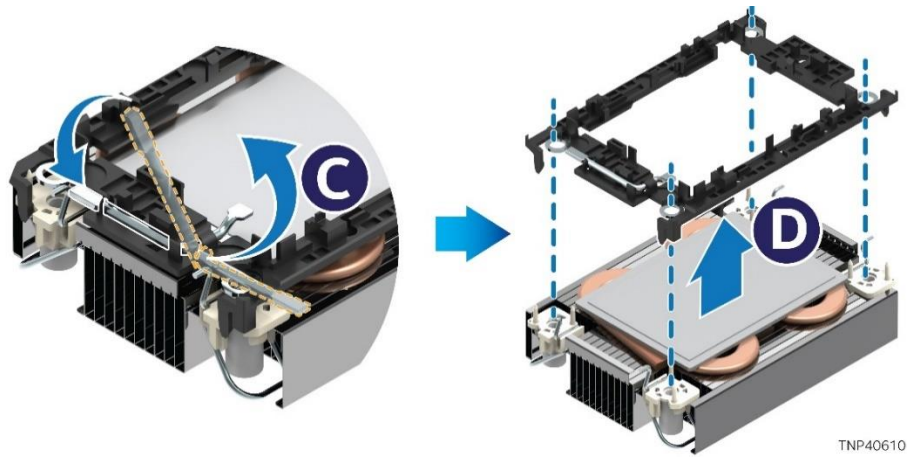


Figure 153. Processor Removal from PHM Assembly

- While holding down the PHM, rotate the lever (see Letter A) from left to right until the processor lifts free from the processor carrier clip.
- Holding down the processor carrier clip, carefully lift the processor and slide it out of the processor carrier clip (see Letter B).



TNP40610

Figure 154. Processor Carrier Clip Removal from PHM Assembly

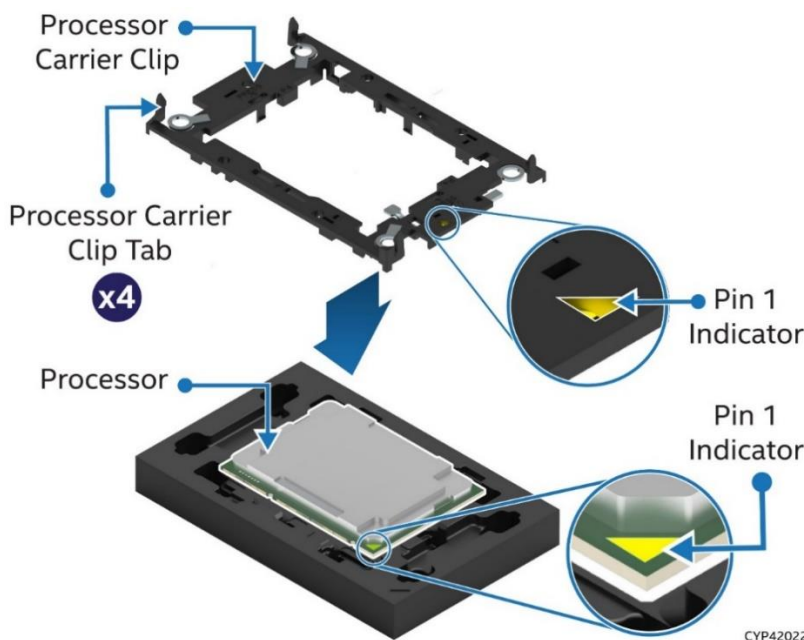
3. Return the lever to the original position (see Letter C).
4. Detach the processor carrier clip from the heat sink.
 - a. Unlatch the hook on each corner of the processor carrier clip and lift it from the heat sink (see Letter D).

7.4.2.3 PHM Reassembly

To properly reassemble the PHM and install it onto the server board, the procedures described in the following sections must be followed in the order specified. These instructions assume that the processor heat sink (new or reuse of existing) has the necessary Thermal Interface Material (TIM) (Honeywell* PTM7000) already applied to the bottom of the heat sink.

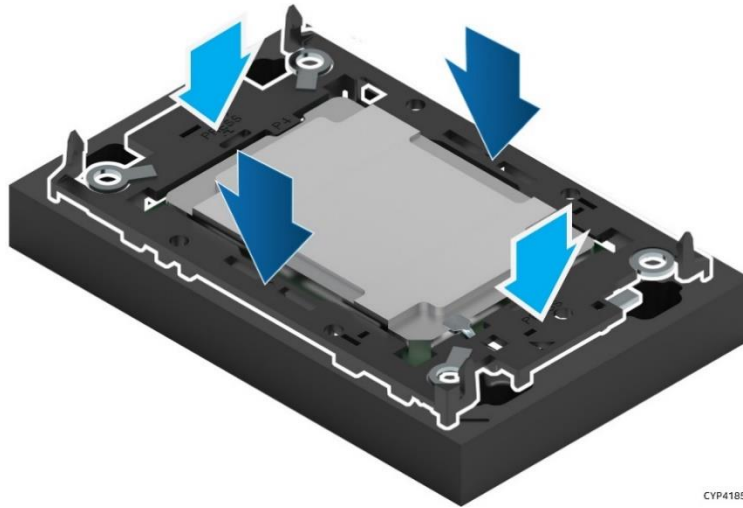
Caution: Full ESD precautions should be followed to perform reassembly of the PHM and reinstallation of the PHM to the server board. The processor itself should Not be handled.

Each component within the PHM assembly includes a Pin 1 indicator. Pin 1 indicator alignment between all components is required throughout the assembly process.



CYP42022

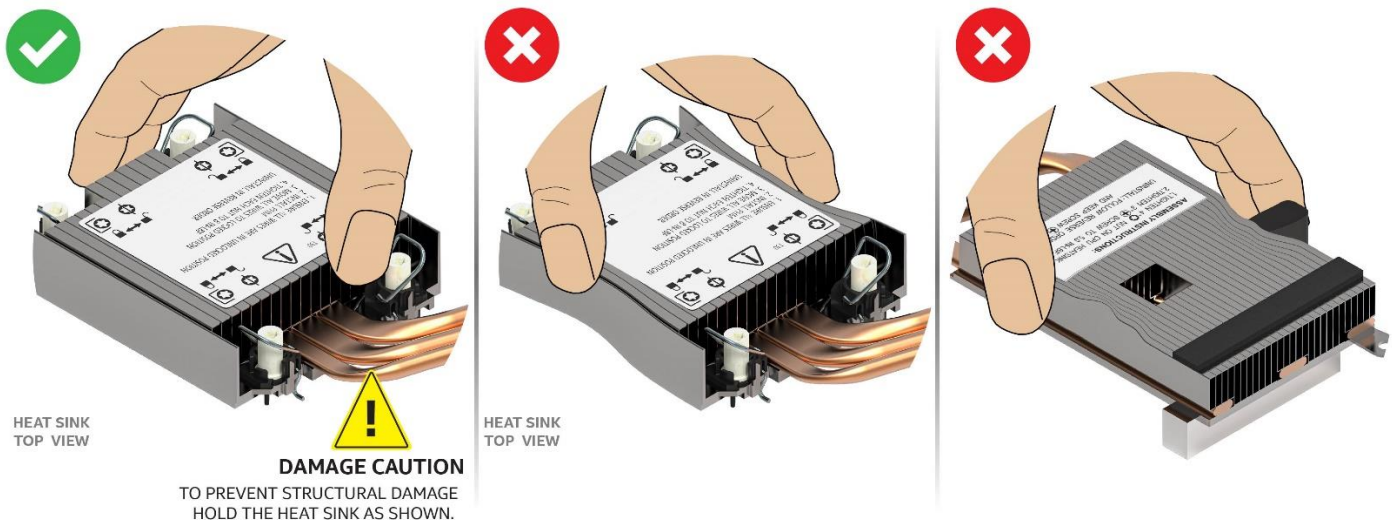
Figure 155. Installing Processor Carrier Clip onto Processor – Part 1



CYP41851

Figure 156. Installing Processor Carrier Clip onto Processor – Part 2

1. With the processor still in its tray, place the processor carrier clip over the processor.
2. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.
3. Gently press down simultaneously on two opposite sides of the processor carrier clip until it clicks in place.
4. Repeat step 3 for the other two sides.
5. Locate the processor heat sink. To avoid damage, grasp it by its narrower sides as shown below.



Ref #: TNP41441

Figure 157. Processor Heat Sink Handling

6. Place the heat sink bottom side up onto a flat surface.

If reusing an existing heat sink

- Properly clean off existing thermal interface material (TIM) from the bottom of the heat sink
- Apply new TIM (Honeywell* PTM7000)

If using a new heat sink

- Remove the plastic protective film (if present) from the Thermal Interface Material (TIM).

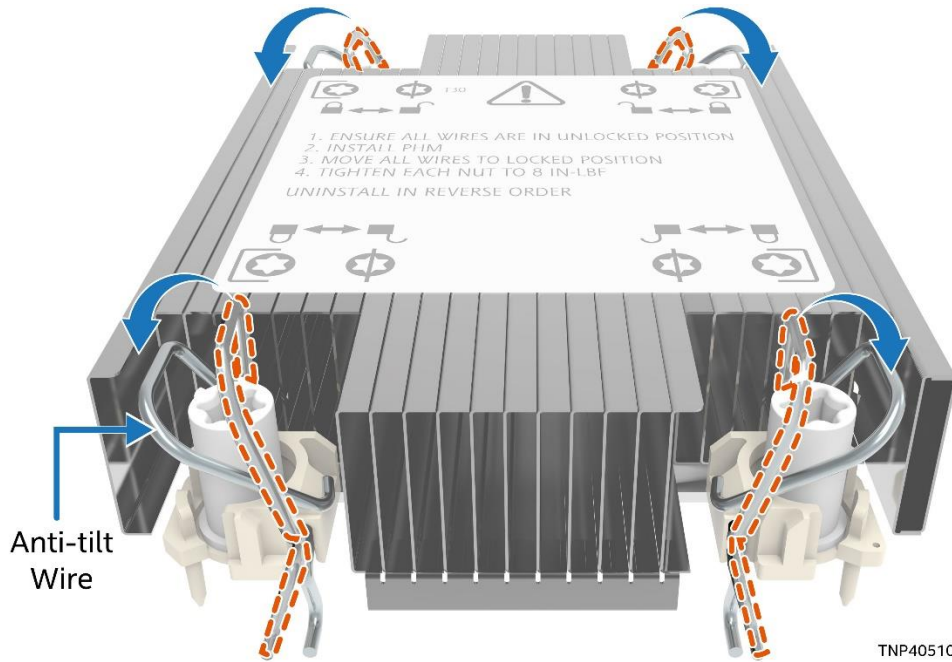


Figure 158. Processor Heat Sink Anti-tilt Wires in the Outward Position

7. Set the anti-tilt wire over each of the four heat sink fasteners to their outward position.

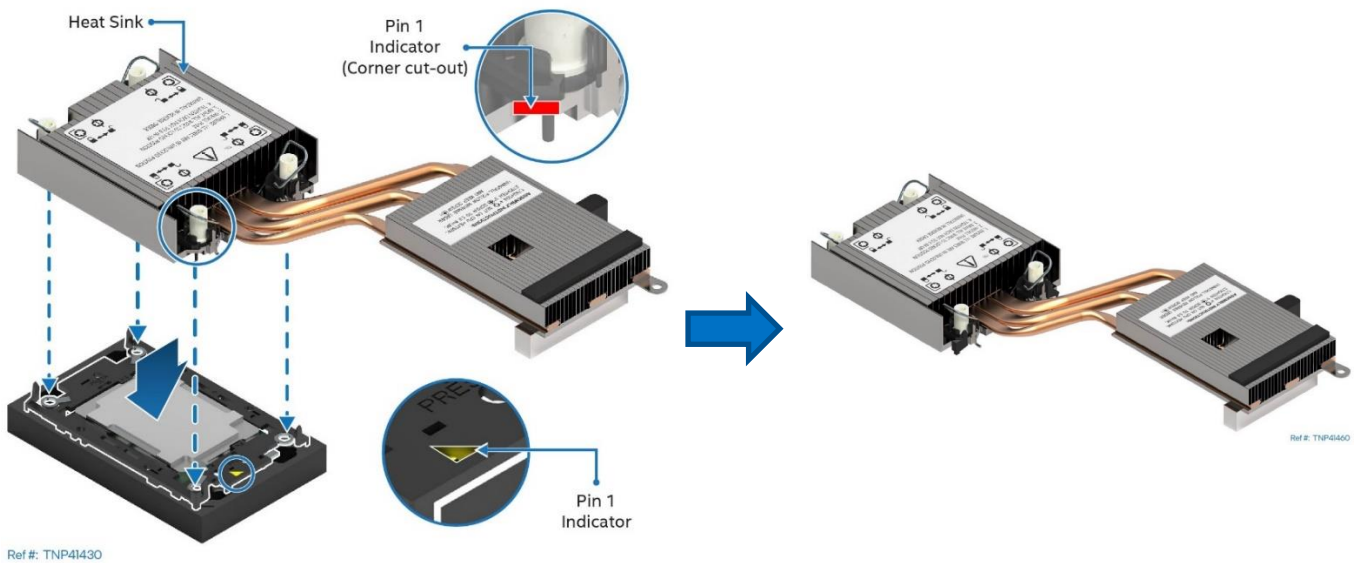


Figure 159. Pin 1 Indicator of Processor Carrier Clip

8. Align the Pin 1 indicator of processor carrier clip with one of the diagonally cut corners on the base of the heat sink. Or (if present) look for the Pin 1 indicator on the corner of the heat sink label.
9. Gently press down the heat sink onto the processor carrier clip until it clicks into place.
10. Ensure that all four heat sink corners are securely latched to the processor carrier clip tabs.

7.4.2.4 PHM Installation

1. If installed, remove the plastic cover from the processor socket.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

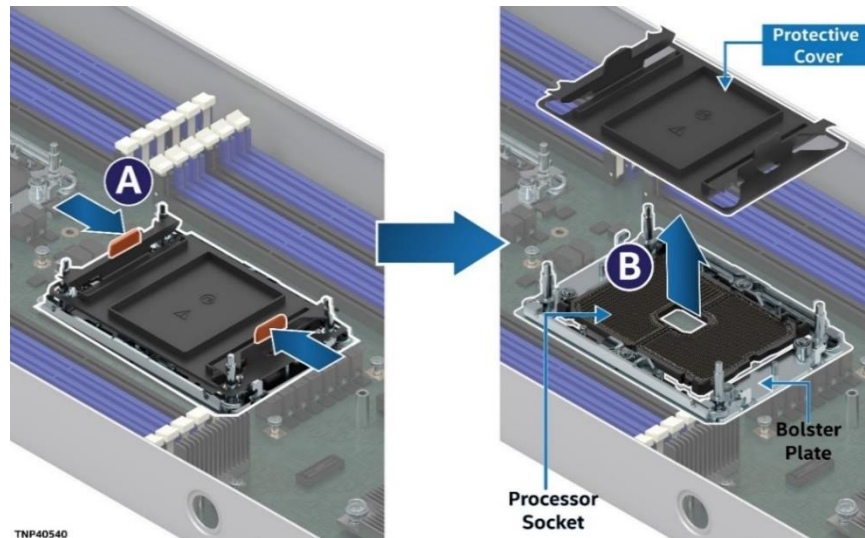


Figure 160. Socket Protective Cover Removal

2. Remove the protective cover by squeezing the finger grips (see Letter A) and pulling the cover up (see Letter B).
3. Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

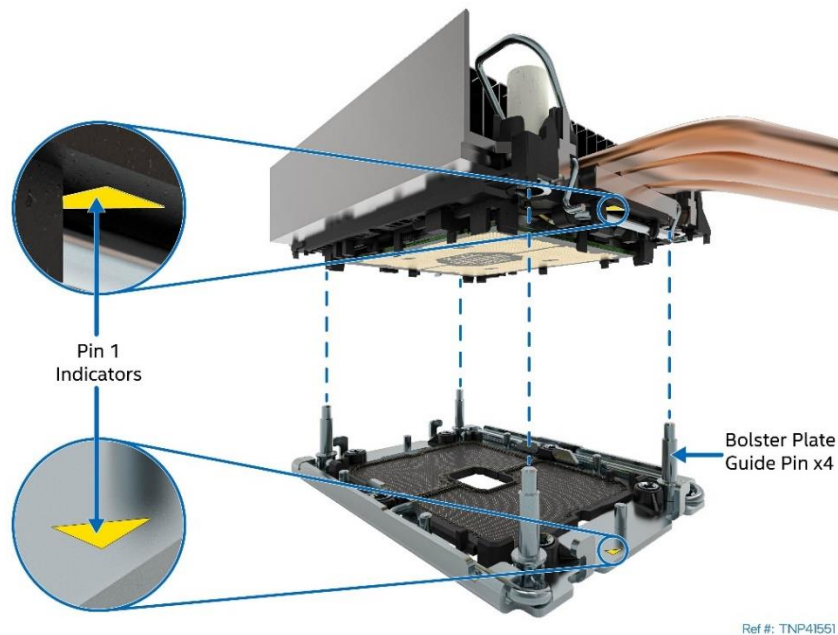


Figure 161. PHM Alignment with Socket Assembly

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the PHM onto the processor socket. Do not drop it.

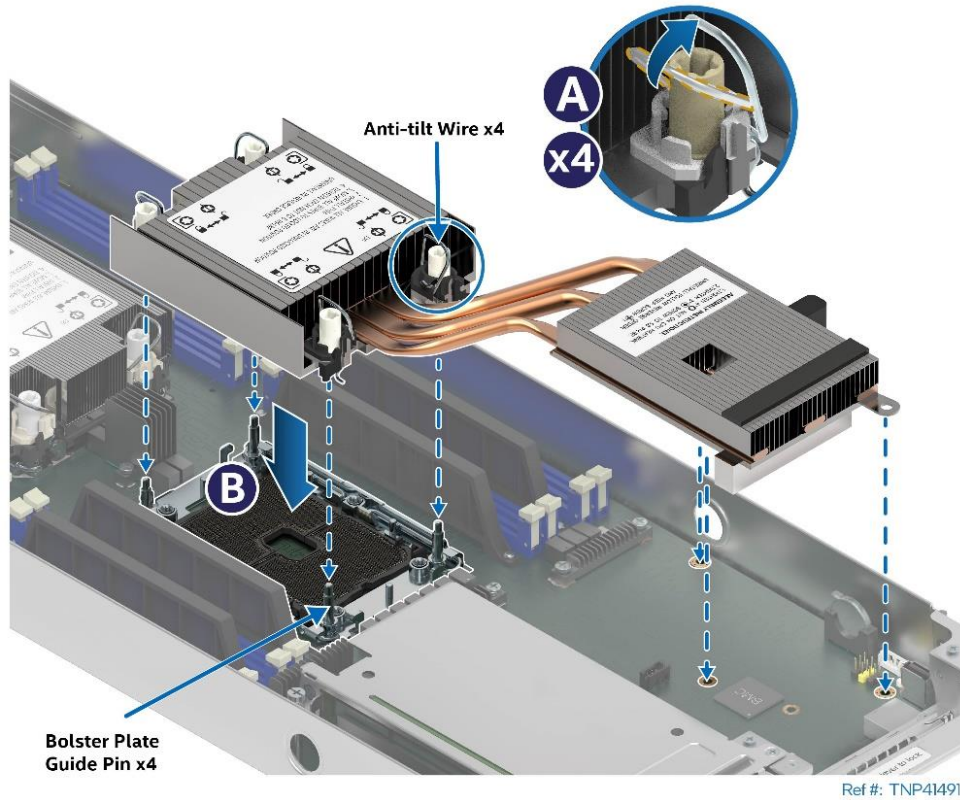


Figure 162. PHM Installation onto Server Board

4. Set all four anti-tilt wires on the heat sink to the inward position (see Letter A).
5. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the socket assembly bolster plate.
6. Carefully lower the PHM over the four bolster plate alignment pins (see Letter B).

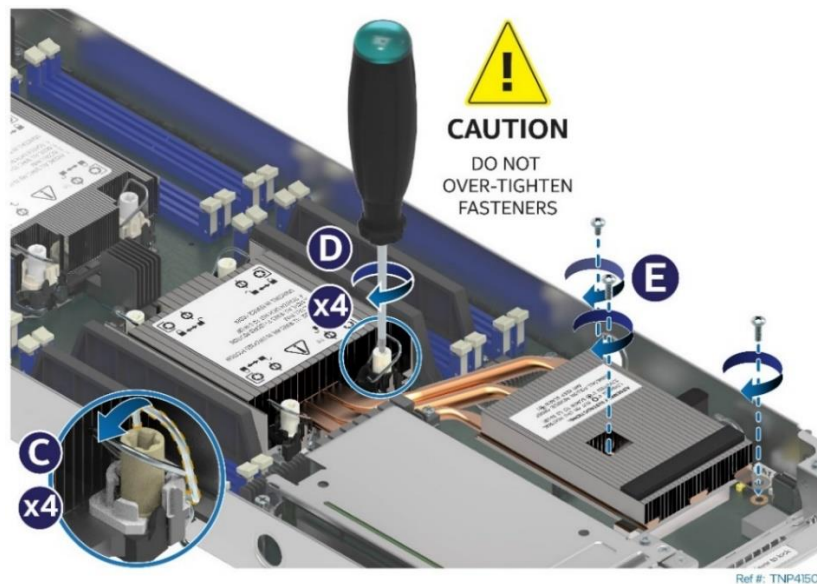
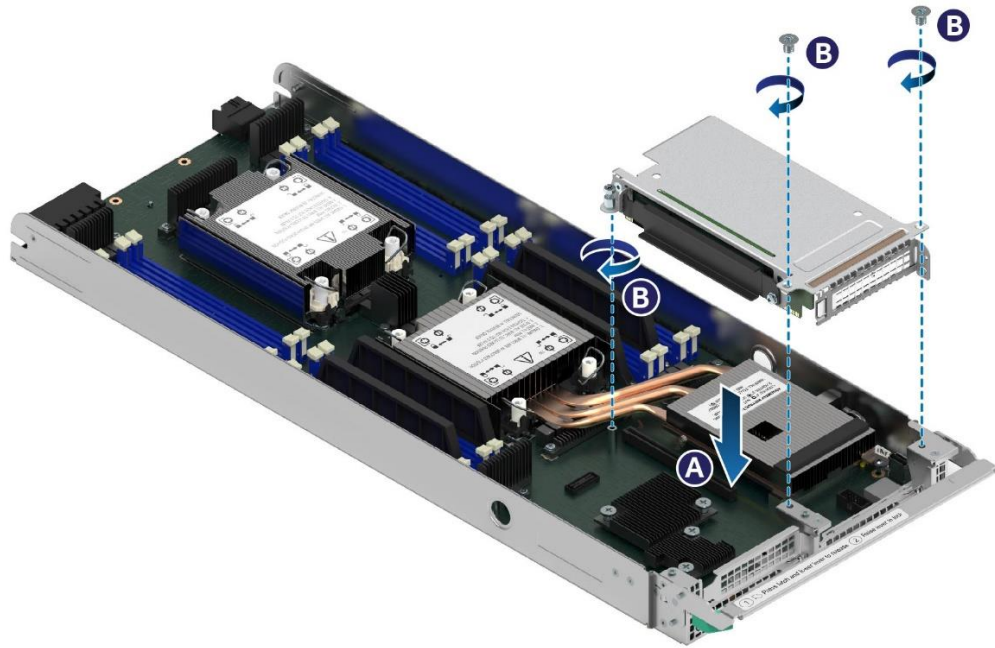


Figure 163. PHM Installation onto Server Board

7. Ensure that the PHM is sitting flat and even on the bolster plate.
8. Set all four anti-tilt wires on the heat sink to the outward position (see Letter C).
9. Using a T30 Torx* screwdriver, tighten the heat sink fasteners to 8 in-lb (see Letter D). No specific sequence is needed for tightening.
10. Using a Phillips screwdriver, tighten the three heat sink extension screws to 5 in-lb (see Letter E).



Ref #: TNP41560

Figure 164. Installing a Riser Assembly

11. Align the riser card edge connector to the riser slot on the server board (see Letter A).
12. Carefully push down on the riser assembly until the riser card is securely seated into the riser slot.
13. Ensure that the three screw holes of the riser assembly are aligned and flush with the mounting holes of the module.
14. With three screws, secure the riser assembly to the module using 8 in-lb. of torque on each screw (see Letter B).
15. Reinstall the air duct and module (see [Sections 7.2.2](#) and [7.1.2](#)).

Note: Intel strongly recommends that both processors are installed. If only one processor is installed, do not install a processor heat sink on an empty socket.

7.4.3 Processor Replacement for Liquid-Cooled Configurations

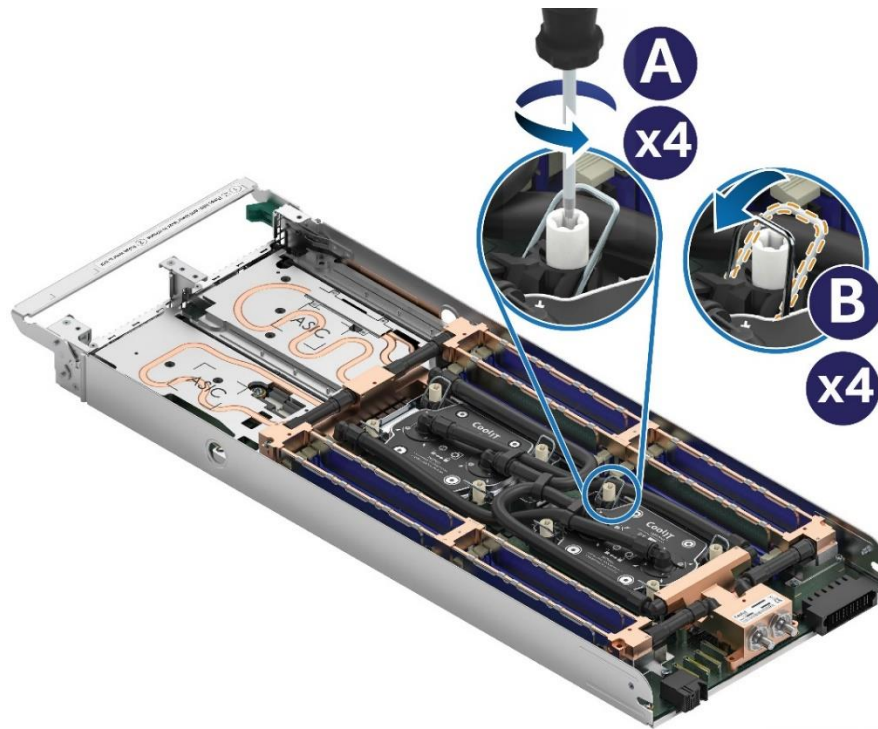
Components Required for each faulty processor:

- New 3rd Gen Intel® Xeon® Scalable processor + included shipping tray
- Existing processor carrier clip
- Existing processor cold plate + new thermal interface material (TIM)

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- ESD Gloves (recommended)
- T-30 Torx* screwdriver
- D50TNP Liquid Cooling VR TIMM Application Tools (iPC TNPLCVRTL5)
- D50TNP Liquid Cooling VR TIMM Application Nozzles (iPC TNPLCVRTNZ)
- D50TNP Liquid Cooling VR TIMM Compound (iPC TNPLCVRCPD)

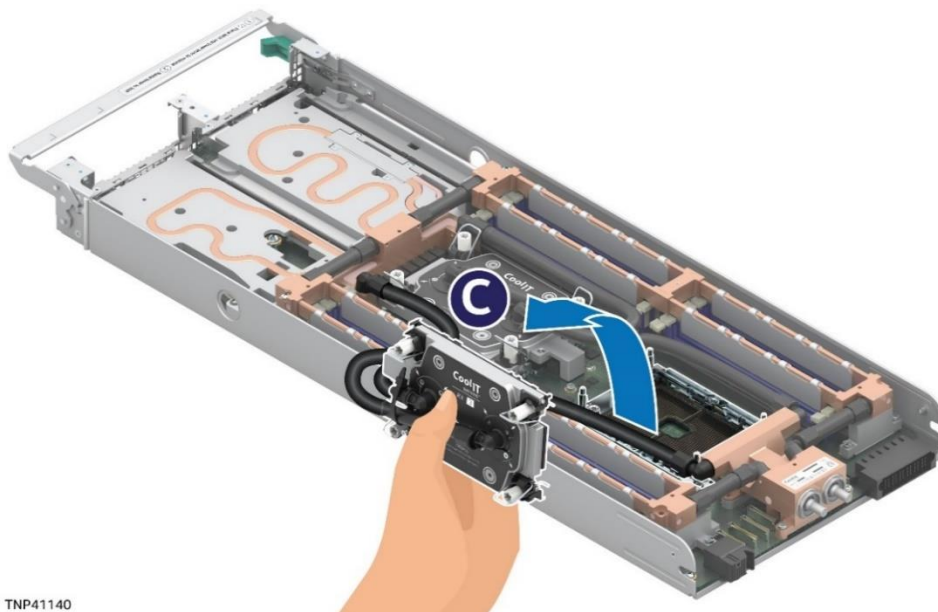
Caution: Wear ESD gloves to prevent electrostatic damage and oxidation or foreign material on processor package and land pads.



Ref #: TNP40781

Figure 165. Loosening Processor Cold Plate Nuts

1. Fully loosen all four fasteners on the processor cold plate in any order (see Letter A).
2. Set all four anti-tilt wires on the cold plate to the inward position (see Letter B).

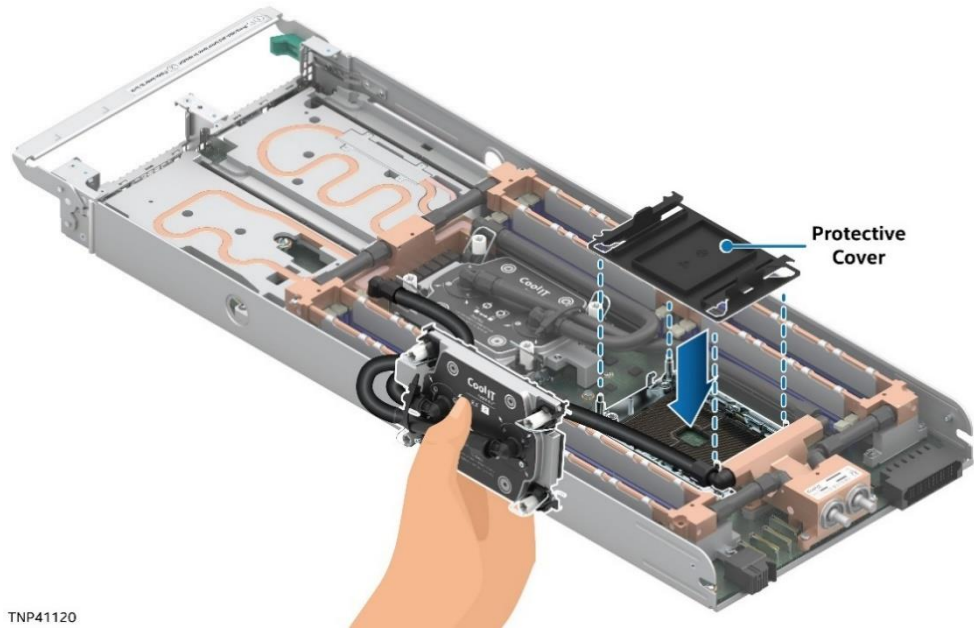


TNP41140

Figure 166. Removing Processor Cold Plate

3. Loosen the center Velcro piece in the middle between the left and right processor cold plates.
4. While holding the processor cold plate, lift it slightly and carefully rotate it off the server board (see Letter C). Do not touch the processor pins.
5. After removing the cold plate, visually inspect that the socket is free of damage or contamination.

Caution: If debris is observed, blow it away gently. Do not use tweezers or any other hard tools to remove the debris.

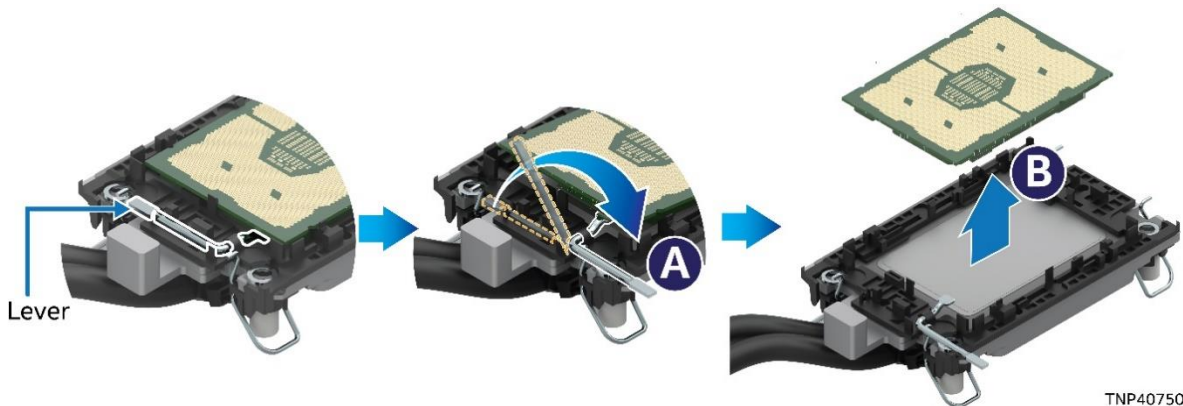


TNP41120

Figure 167. Reinstall the Socket Cover

6. Reinstall the socket cover to protect the socket pins before proceeding to the next step
 - Squeeze the finger grips at each end of the cover and carefully lower the cover onto the socket. Then, release the finger grips.
 - Ensure that the socket cover is locked in place.

Note: Do not press down on the center of the socket cover.



TNP40750

Figure 168. Processor Removal from Processor Carrier Clip and Processor Cold Plate

7. While holding down the processor cold plate without stretching the hose, rotate the lever (see Letter A) from left to right until the processor lifts from the processor carrier clip.
8. Holding down the processor carrier clip, carefully lift the processor and slide it out of the processor carrier clip (see Letter B).

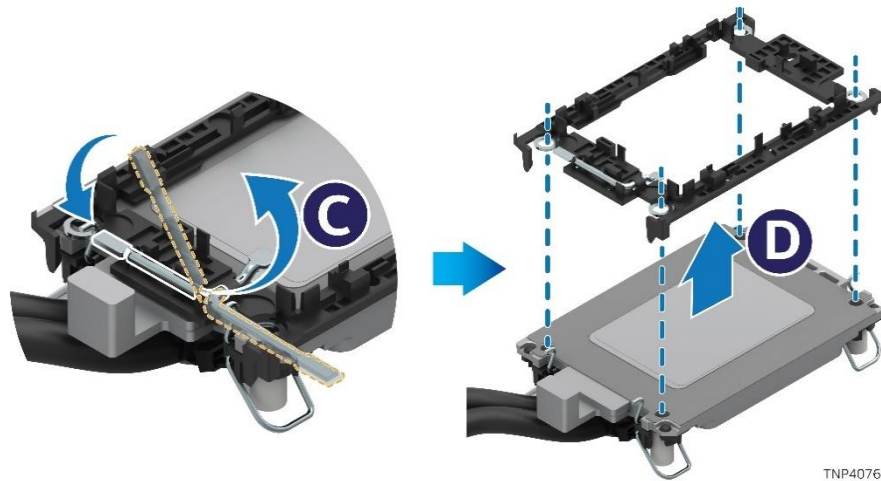


Figure 169. Processor Carrier Clip Removal from Processor Cold Plate

9. Return the lever to the original position (see Letter C).
10. Detach the processor carrier clip from the processor cold plate.
 - Unlatch the hook on each corner of the processor carrier clip and lift it from the processor cold plate (see Letter D).

To properly reassemble the new processor and processor carrier clip and install them onto the server board, the following procedures must be followed in the order specified. These instructions assume that the processor cold plate has the necessary Thermal Interface Material (TIM) (DOW CORNING* TC-5622) already applied to the bottom of the cold plate.

Caution: Full ESD precautions should be followed to perform reassembly of the PHM and reinstallation of the PHM to the server board. The processor itself should Not be handled.

The new processor, processor carrier clip, and processor socket all have a Pin 1 indicator. Pin 1 indicator alignment between all these components is required throughout the assembly process.

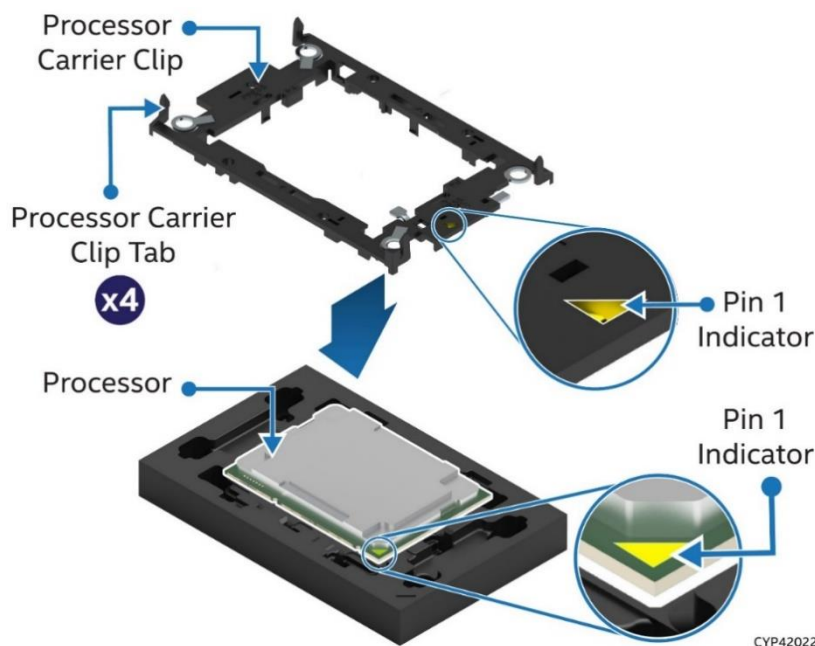


Figure 170. Installing Processor Carrier clip onto Processor – Part 1

11. With the processor still in its tray, place the processor carrier clip over the processor.
12. Ensure that the Pin 1 indicator on the processor carrier clip is aligned with the Pin 1 indicator of the processor.

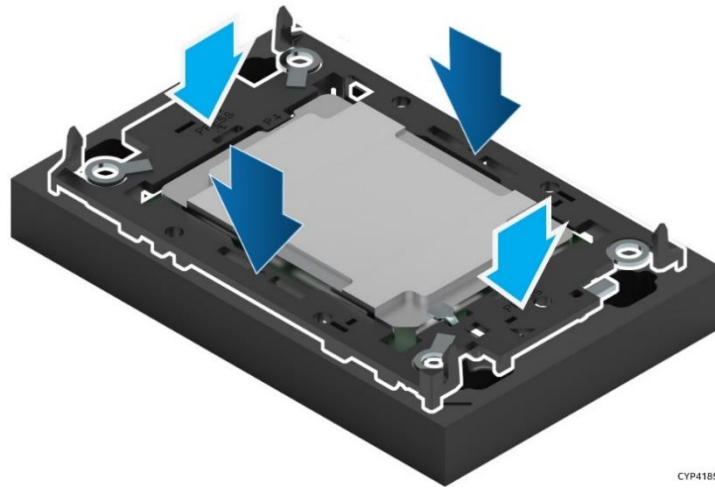


Figure 171. Installing Processor Carrier Clip onto Processor – Part 2

13. Gently press down simultaneously on two opposite sides of the processor carrier clip until it clicks in place
14. Repeat step 12 for the other two sides.

Caution: Do not touch the socket pins. The pins inside the processor socket are extremely sensitive. A damaged processor socket may produce unpredictable system errors.

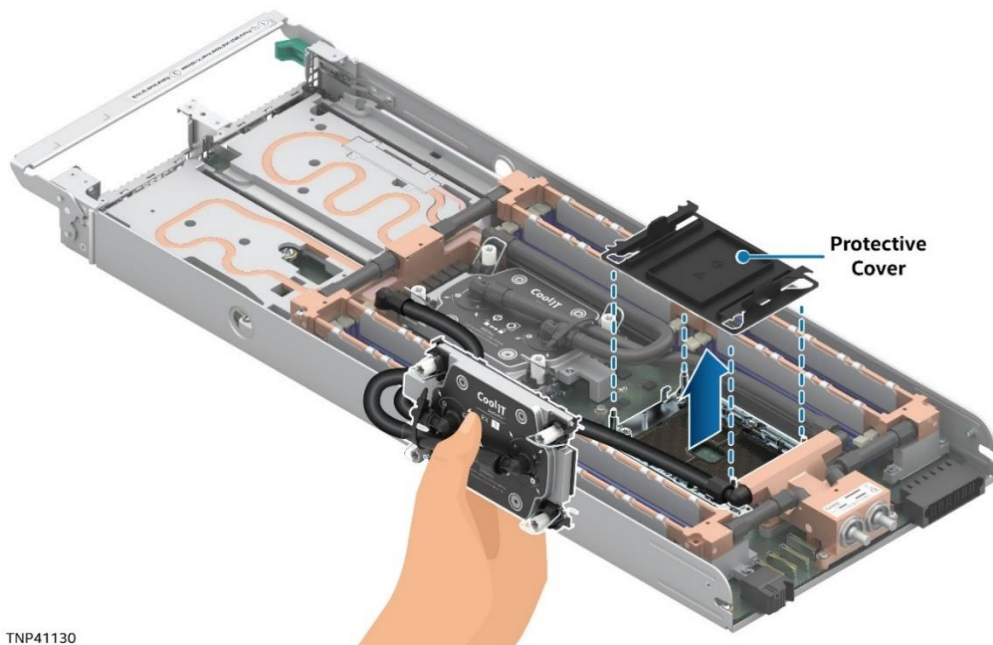
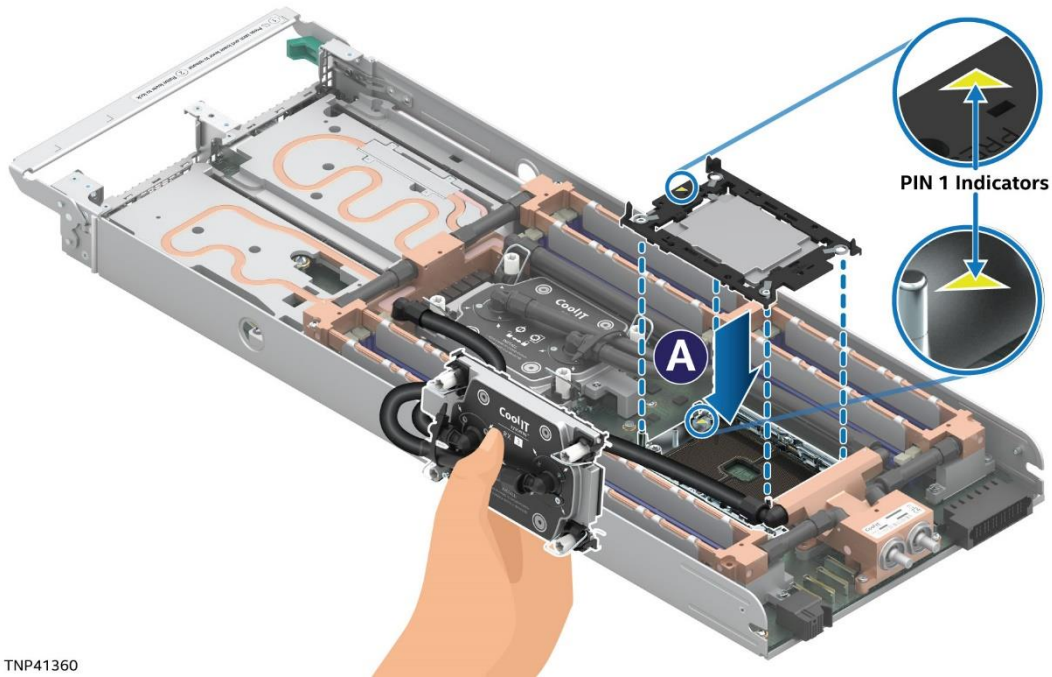


Figure 172. Socket Protective Cover Removal

15. Remove the socket protective cover by squeezing the finger grips and pulling the cover up.
16. Ensure that the socket is free of damage or contamination before installing the PHM.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

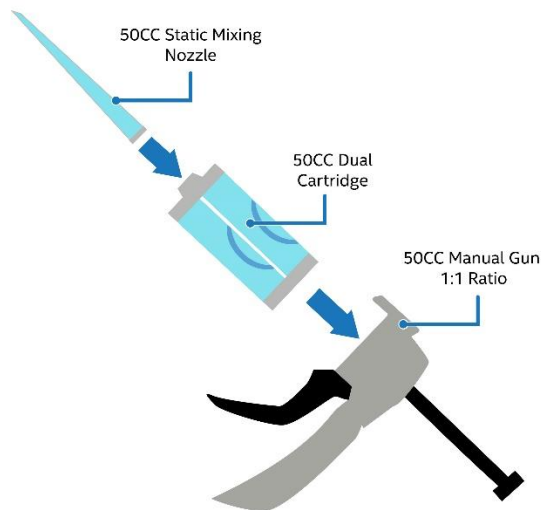


TNP41360

Figure 173. Processor Installation onto Server Board

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the processor onto the processor socket. Do not drop it.

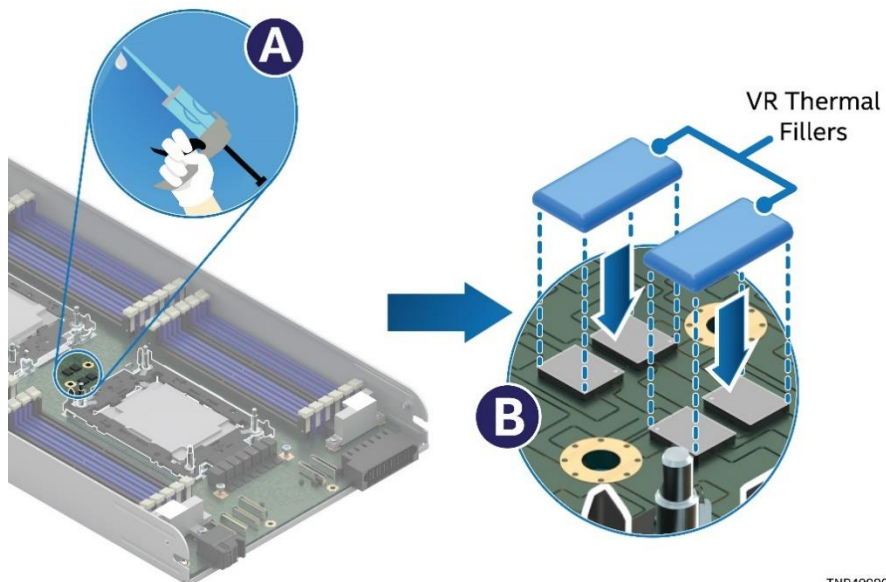
- Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the bolster plate. Place the processor carrier clip and processor on the socket (see Letter A).



TNP41011

Figure 174. Assembling the Manual Applicator

- Assemble the Bergquist SS95407 applicator, Bergquist GF3500S35 thermal gap filler cartridge, and Bergquist SS95437 nozzle as shown in the above figure.

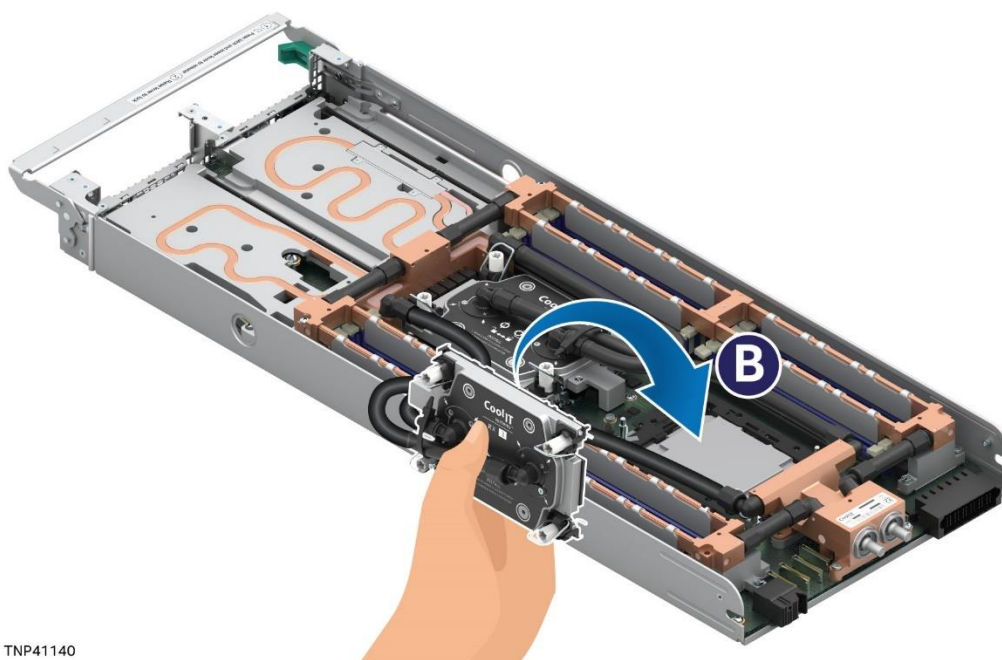


TNP40990

Figure 175. Applying Center VR Thermal Gap Filler

19. Using the assembled applicator (see Letter A), apply the thermal gap filler on top of center processor Voltage Regulator (VR) components (see Letter B). Apply the filler only on the VR associated with the processor currently being replaced.

Note: Apply enough thermal gap filler (~0.3 cubic centimeters) to fully cover the VR components with a minimum thickness of 1 mm.



TNP41140

Figure 176. Reinstalling Processor Cold Plate

20. Carefully reinstall the processor cold plate back onto the bolster plate's alignment pins (see Letter B).

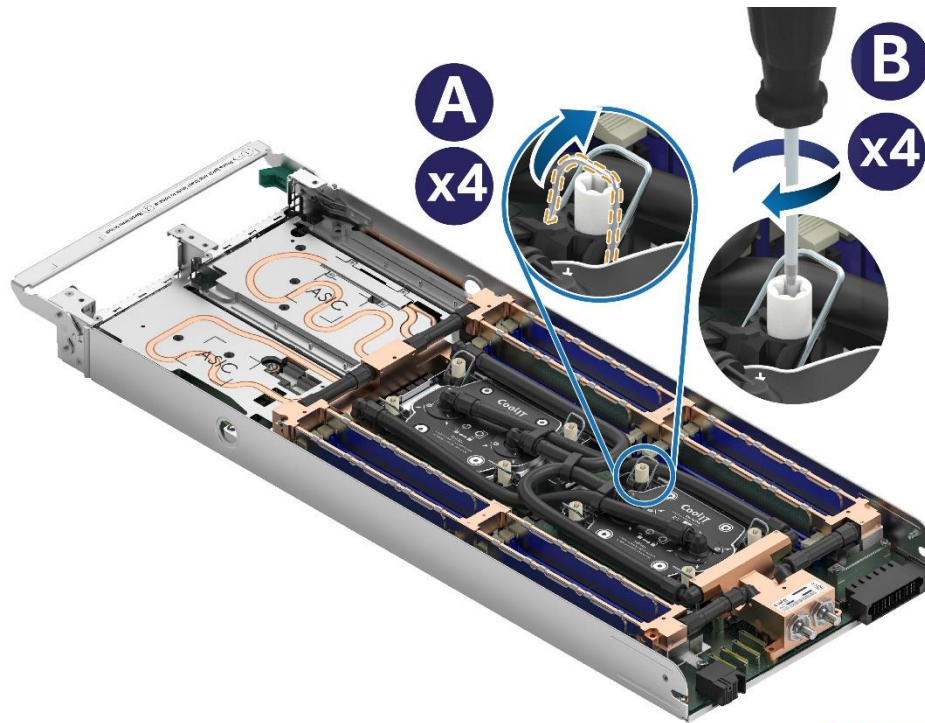


Figure 177. Securing Processor Cold Plate

21. Set all four anti-tilt wires on the cold plates to the outward position (see Letter A).
22. Using a T30 Torx* screwdriver, tighten the cold plate fasteners to 8 in-lb. No specific sequence is needed for tightening.
23. Tighten the center Velcro piece in the middle between the left and right processor cold plates.

7.5 Memory Module Replacement

7.5.1 Memory Module Replacement for Air-Cooled Modules

The Intel® Server Boards D50TNP1SB and D50TNP1SBCR support standard DDR4, RDIMMs, and LDRIMMs. In addition, the D50TNP1SB server board supports Intel® Optane™ persistent memory 200 series modules (also known as, Intel® Optane™ PMem).

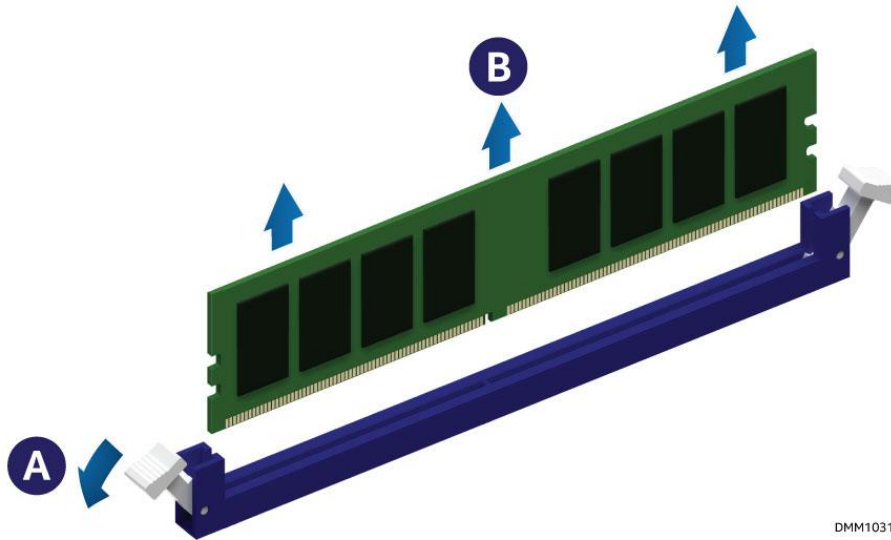
Note: See [Appendix B](#) for general memory population rules.

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)

The figures below show standard DDR4 DIMMs but the steps of DDR4 DIMM replacement are the same between standard DDR4 DIMMs and Intel® Optane™ PMem modules.

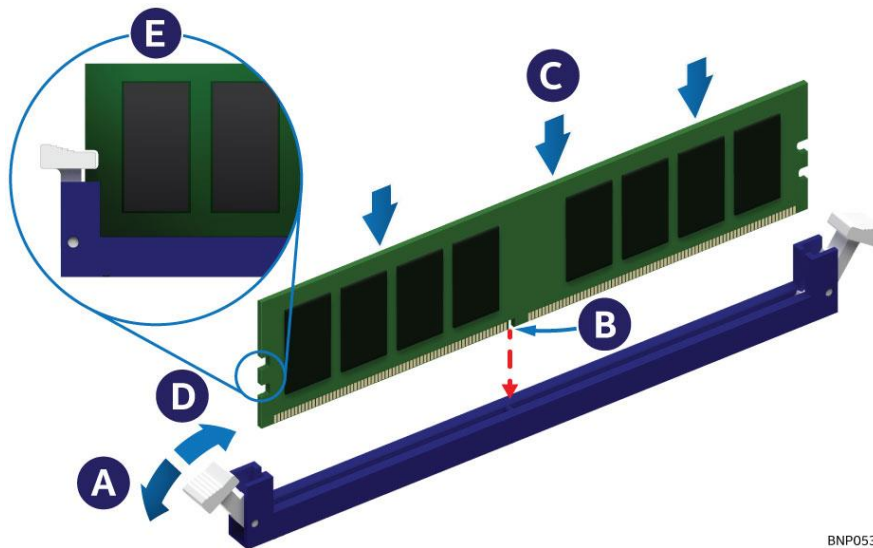
Standard DDR4 DIMMs and Intel® Optane™ PMem devices are commonly referred to as “memory module” in the following instructions.



DMM1031

Figure 178. Removing the Memory Module from an Air-Cooled System

1. Identify and locate the memory module to be replaced.
2. Ensure that the ejection tabs of adjacent memory slots are closed.
3. Open the ejection tabs at both ends of the selected memory slot (see Letter A). The memory module will slightly lift from the slot.
4. Holding the memory module by its edges, lift it away from the slot (see Letter B).



BNP053

Figure 179. Installing the Memory Module in an Air-Cooled System

5. Ensure that the ejection tabs at both ends of the memory slot are pushed outward to the open position (see Letter A).
6. Carefully unpack the replacement memory module, taking care to only handle the device by its outer edges.
7. Align the notch at the bottom edge of the memory module with the key in the memory slot (see Letter B).
8. Insert the memory module into the memory slot:
 - a. Using even pressure along the top edge, push down on the memory module (see letter C) until the ejection tabs of the memory slot snap into place (see Letter D).
9. Ensure that the ejection tabs are firmly in place (see Letter E).

7.5.2 Memory Module Replacement for Liquid-Cooled Modules

Required Tools and Supplies:

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #2
- Memory replacement tool and retention clip (see [Figure 180](#))



Figure 180. Memory Replacement Tools and Retention Clip

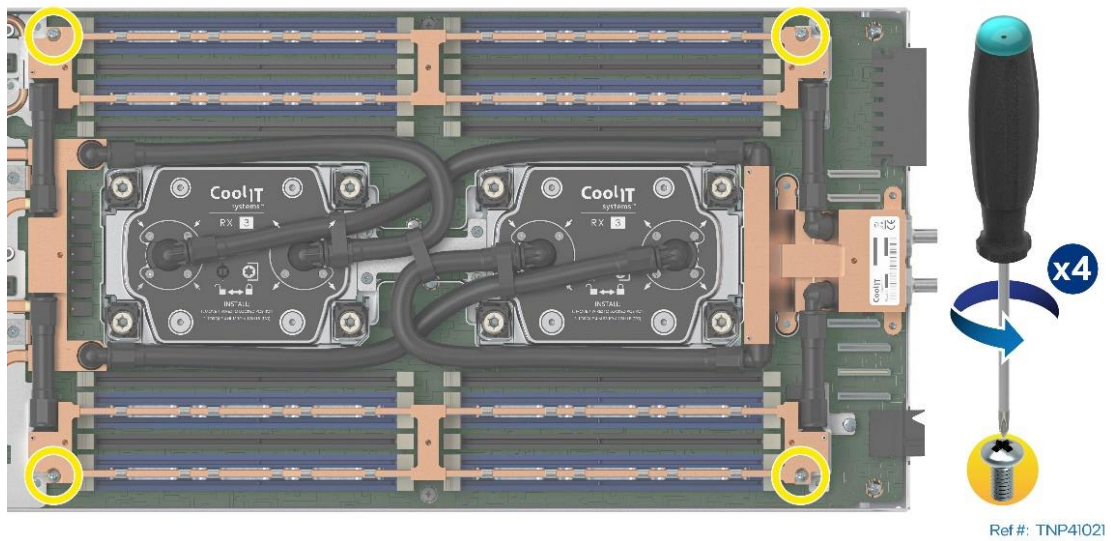
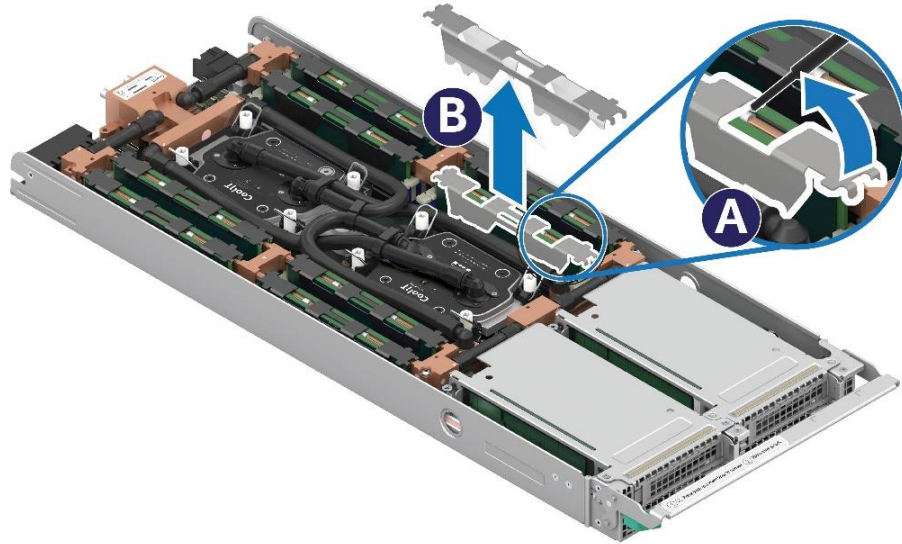


Figure 181. Loosen Memory Cooler Mounting Screws

1. Ensure that the memory cooler mounting screws are loosened.



Ref #: TNP40712

Figure 182. Removing the DIMM Retention Clips

2. Identify and locate the memory module to be replaced.
3. Use the memory removal tool as a lever and position one end between the DIMM retention clip and the liquid-cooling loop (see Letter A).
4. Lift the DIMM retention clip from the liquid-cooling loop (see Letter B).

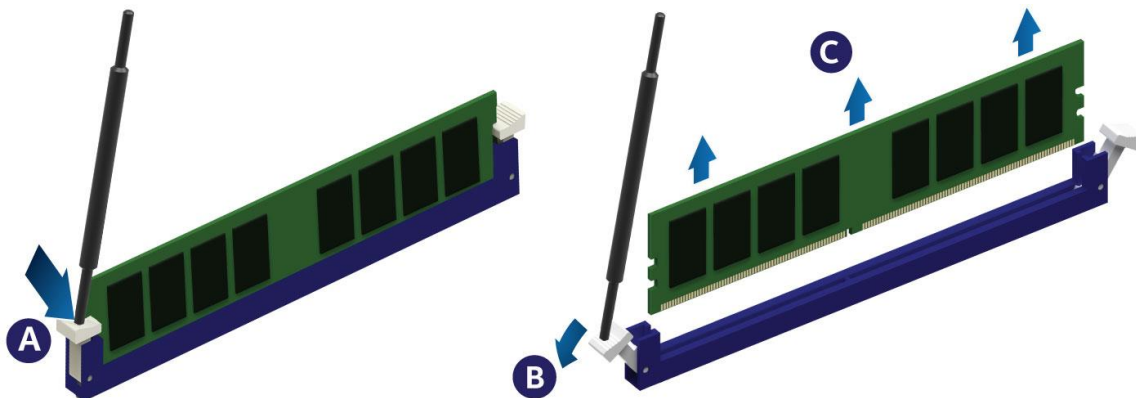
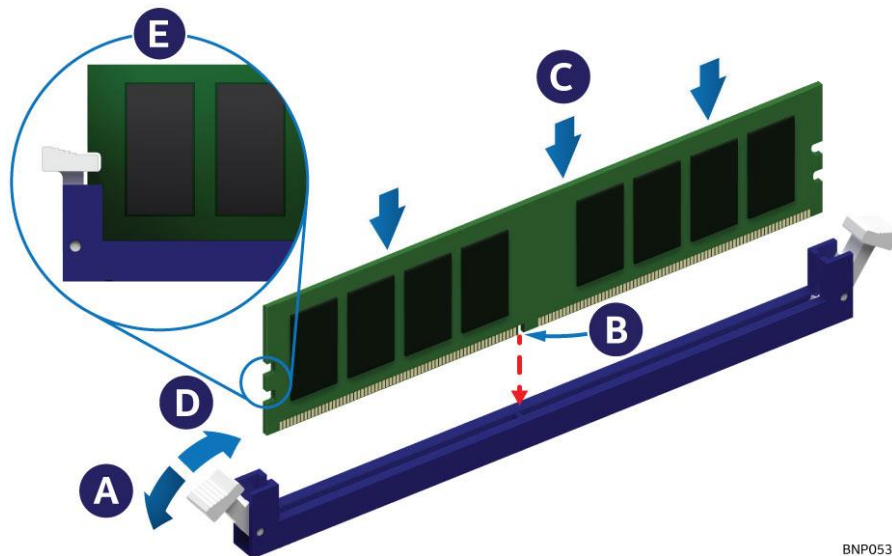


Figure 183. Removing the Memory Module from a Liquid-Cooled System

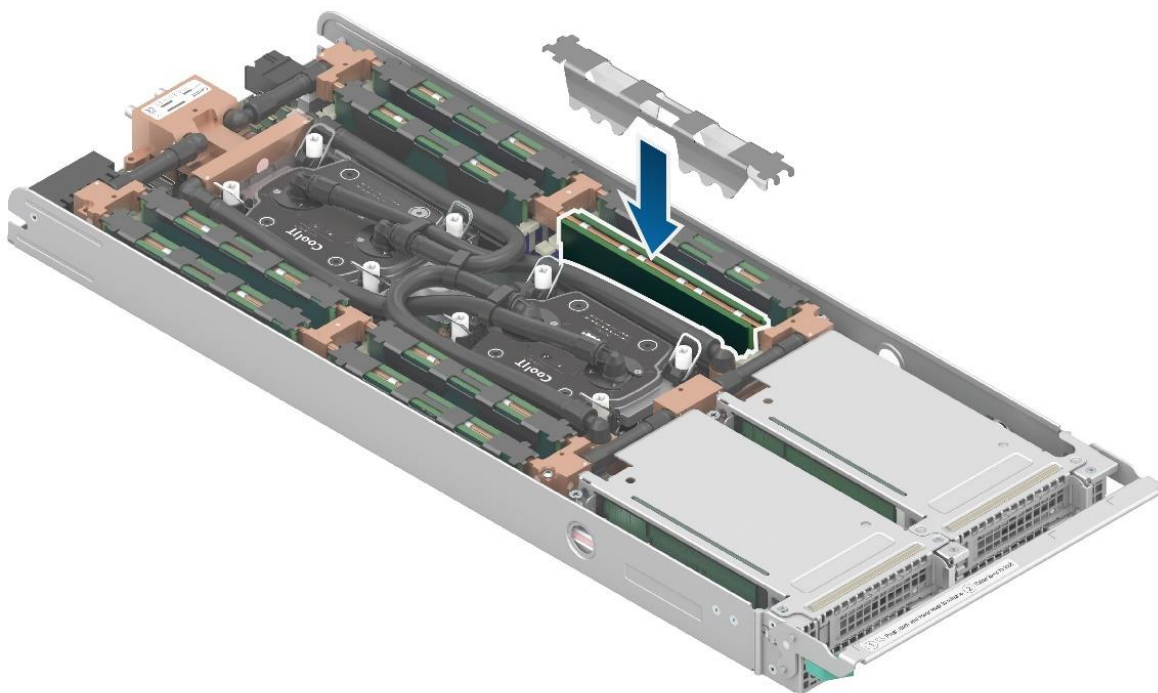
5. Using the memory replacement tool, open the ejection tabs at both ends of the memory slot (see Letters A and B). The memory module will slightly lift from the slot.
6. Hold the memory module by its edges and lift it away from the slot (see Letter C).



BNP053

Figure 184. Installing the Memory Module in a Liquid-Cooled System

7. Ensure that the ejection tabs at both ends of the memory slot are pushed outward to the open position (see Letter A). Use the memory replacement tool if the memory ejection tabs are in the closed position.
8. Carefully unpack the replacement memory module, taking care to only handle it by its outer edges.
9. Align the notch at the bottom edge of the memory module with the key in the memory slot (see Letter B).
10. Insert the memory module into the memory slot:
 - Using even pressure along the top edge, push down on the memory module (see Letter C) until the ejection tabs snap into place (see Letter D).
11. Ensure that the ejection tabs are firmly in place (see Letter E).



Ref #: TNP40702

Figure 185. Installing the DIMM Retention Clips

12. Install all the DIMM retention clips over the select DIMM pair and heat spreader as shown.
13. Ensure that the clip is securely in place.

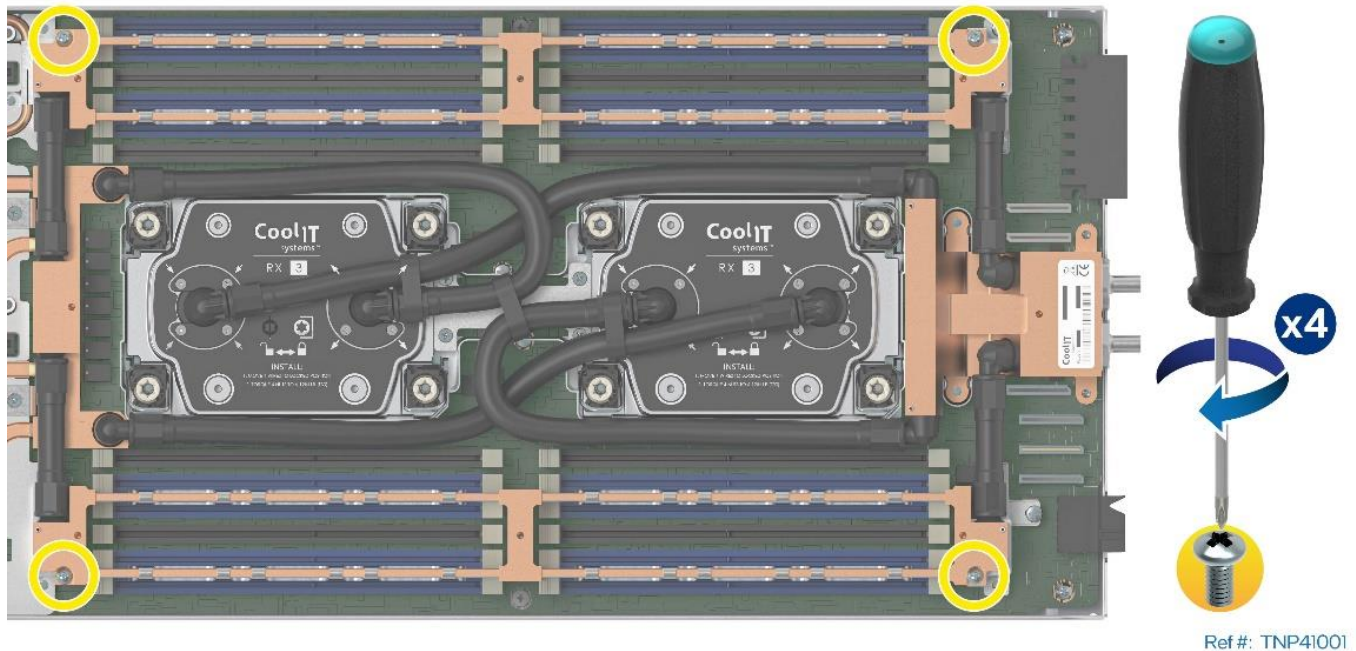


Figure 186. Securing the Memory Cooler to the Server Board

14. Tighten the fastener screws to secure the memory cooler to the server board.

7.6 Memory Heat Spreader Thermal Pad Replacement (Liquid-Cooled Modules Only)

In liquid-cooled module configurations, the heat generated from installed DIMMs is drawn out of the module by means of an array of memory heat spreaders. The heat spreaders are interconnected to the internal plumbing of the liquid-cooling loop. Each heat spreader is positioned in between two DIMMs. Thermal pads are affixed to both sides of a heat spreader to ensure efficient heat dissipation from the DIMMs to the heat spreader.

If a thermal pad becomes damaged while installing or removing a DIMM, or becomes damaged or worn for other reasons, the following sections provide the instructions necessary to remove and replace a heat spreader thermal pad.

Note: To maintain optimal performance of the liquid-cooling loop, Intel recommends replacing ALL thermal pads at once.

1. Remove all DIMMs from the module (see [Section 7.5.2](#)).

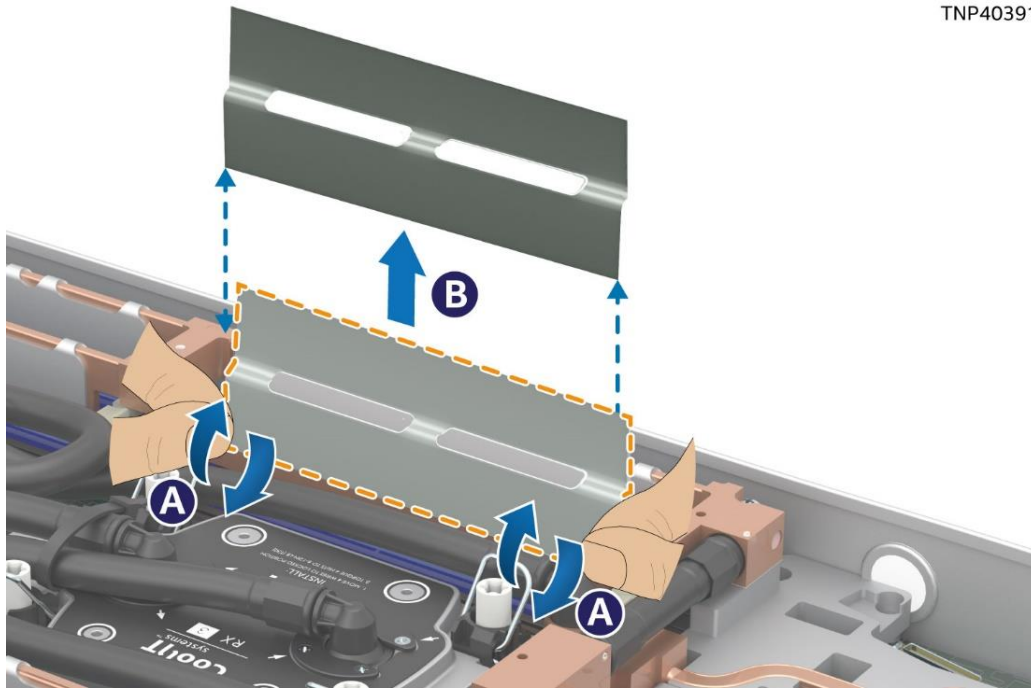


Figure 187. Removing Thermal Pad

2. Carefully peel away the thermal pads from both sides of all heat spreaders (see Letter A) and lift them up and away from the heat spreaders (see Letter B).
3. Using isopropyl alcohol and a lint free cloth, carefully clean the surface of each heat spreader. Ensure that no thermal pad residue remains.

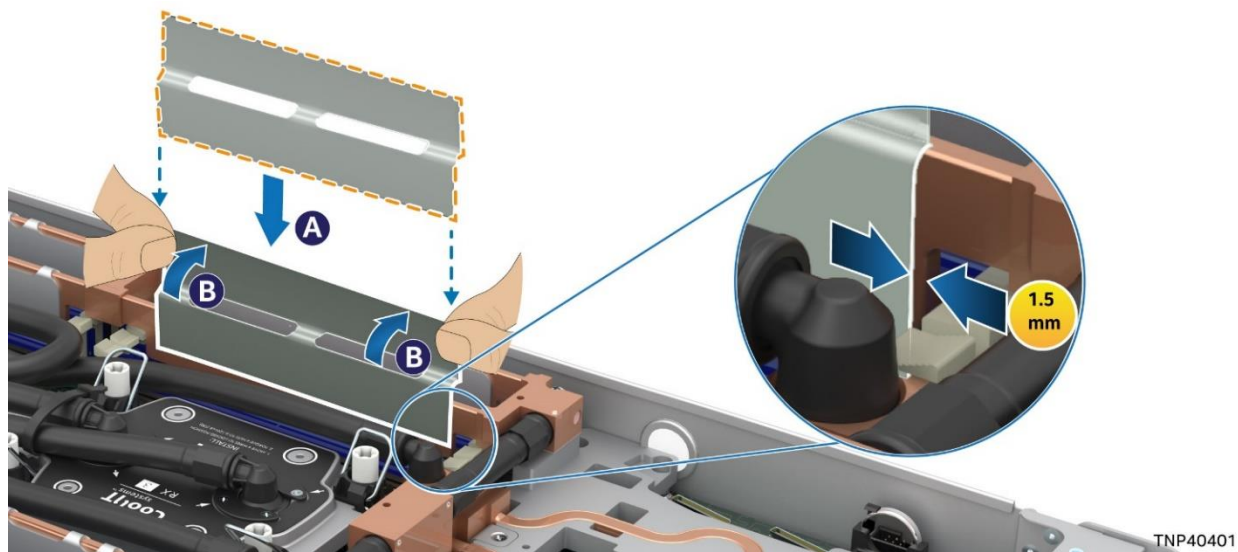


Figure 188. Installing Thermal Pad

4. Apply a new thermal pad to the heat spreader by aligning the thermal pad's cut-out edges with the heat spreader's shape (see Letter A).
5. Fold the thermal pad to the opposite side of the heat spreader (see Letter B).
6. Use plastic tweezers (or the included DIMM removal tool) to apply pressure along the thermal pad from one side to the other. Ensure that no air bubbles remain between the thermal pad and the heat spreader.
7. Install the previously removed DIMMs (see [Section 7.5.2](#)).

7.7 M.2 Storage Devices Replacement

This procedure applies to M.2 storage replacement for both 1U and 2U riser assemblies with illustrations showing differences where applicable.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

7.7.1 M.2 and Heat Sink Replacement for Air-Cooled Configurations

Remove the riser assembly that the M.2 SSD is attached to (see [Section 7.8](#)).

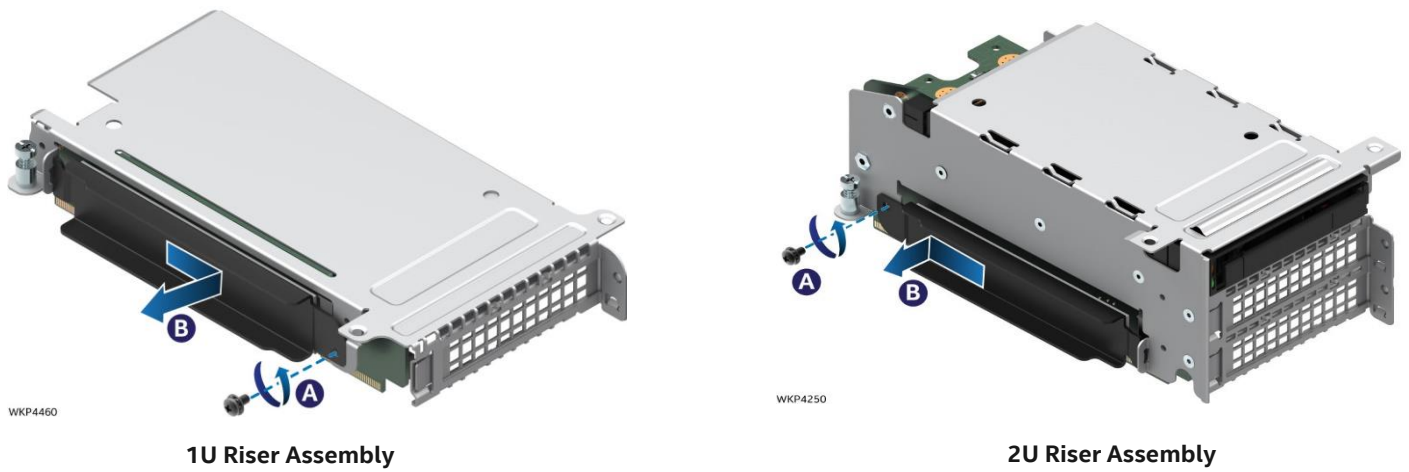


Figure 189. Removing Air-Cooled M.2 Heat Sink

1. Locate the heat sink on the left side of the riser assembly and remove the screw (see Letter A).
2. Slide the heat sink in the direction shown to remove it (see Letter B).

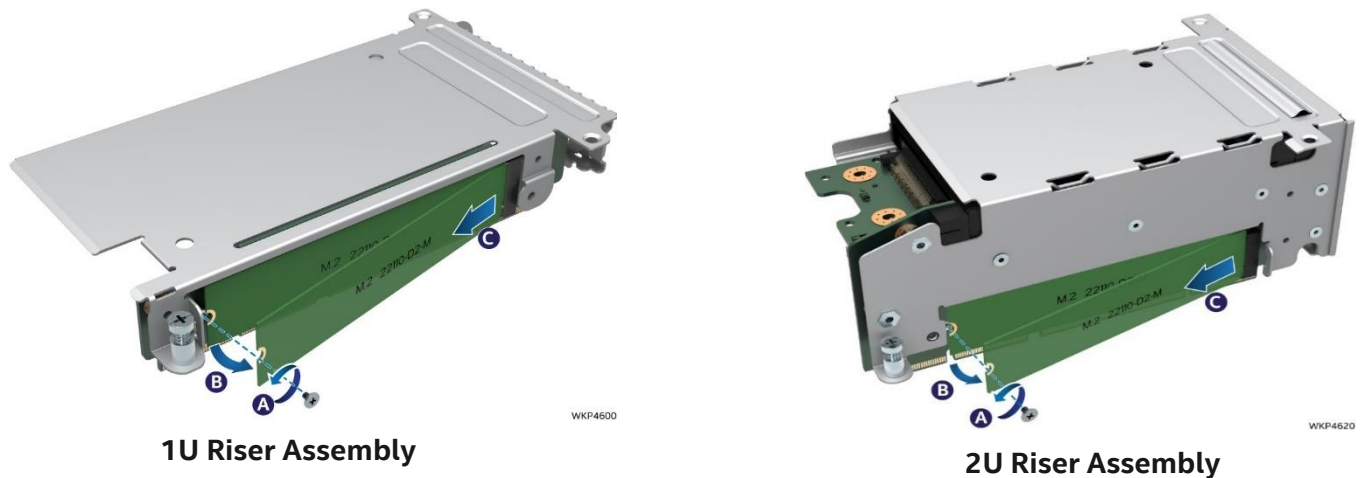


Figure 190. Removing Air-Cooled M.2 SSD

3. Remove the screw from the M.2 mounting standoff on the left side of the riser assembly (see Letter A).
4. Carefully rotate outward the free end of the M.2 SSD away from the riser assembly (see Letter B).
5. Grasp the M.2 SSD by its edges and gently remove it from the connector in the direction shown (see Letter C).

If no SSD is being installed, follow steps 6 and 7. If the SSD is being replaced, skip steps 6 and 7:

6. Return the previously removed screw to the M.2 mounting standoff.
7. Reinstall the M.2 heat sink on to the riser assembly.

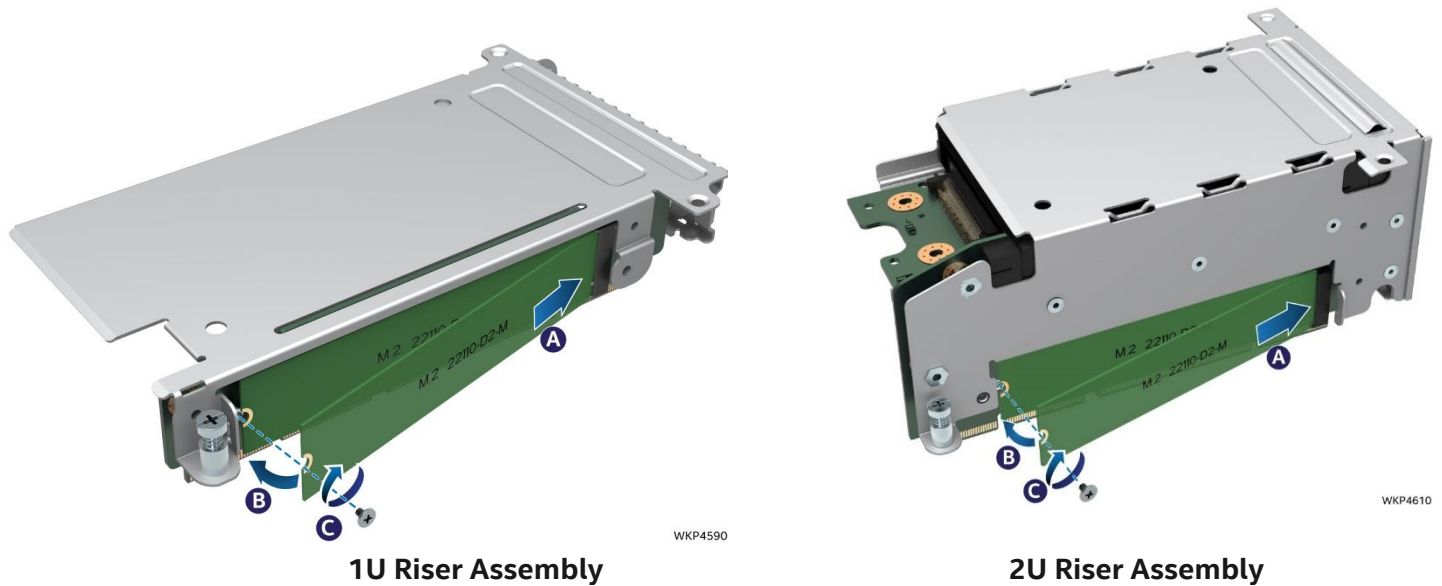


Figure 191. Installing Air-Cooled M.2 SSD

8. Remove the screw from the M.2 mounting standoff on the left side of the riser assembly.
9. Align the notch within the SSD edge connector with the key in the M.2 connector and insert the SSD into the connector (see Letter A).
10. Push the free edge of the SSD towards the riser assembly (see Letter B) and secure the SSD to the M.2 mounting standoff with the previously removed screw (see Letter C).

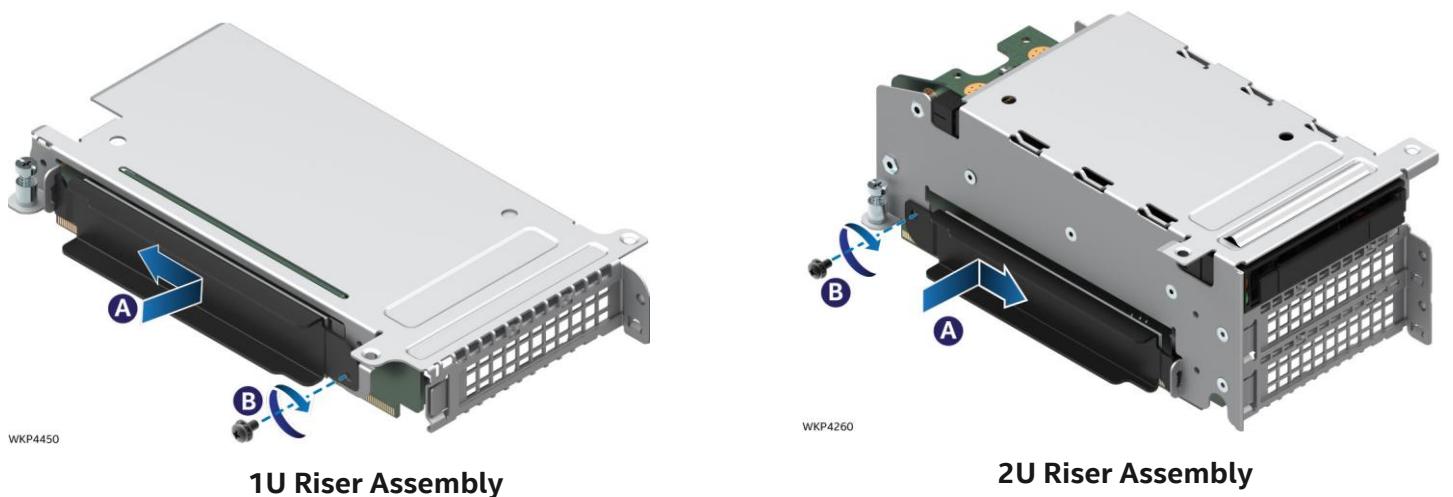


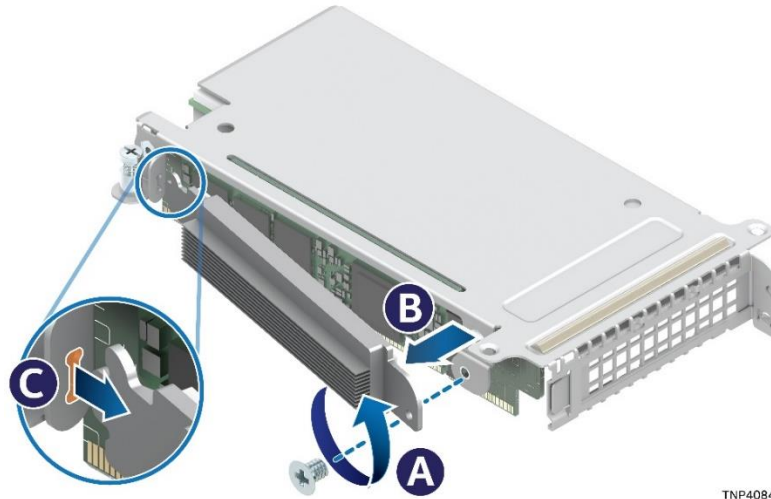
Figure 192. Installing Air-Cooled M.2 Heat Sink

11. If installing a new heat sink, peel off the protective film from the thermal interface material.
12. Align the heat sink to the riser assembly and slide into place in the direction shown (see Letter A).
13. Ensure that the screw holes are properly aligned. Then, secure the heat sink to the riser assembly with a screw (see Letter B).

7.7.2 M.2 SSD and Cold Plate Replacement for Liquid-Cooled Configurations

Remove the riser assembly that the M.2 SSD is attached to (see [Section 7.8](#)).

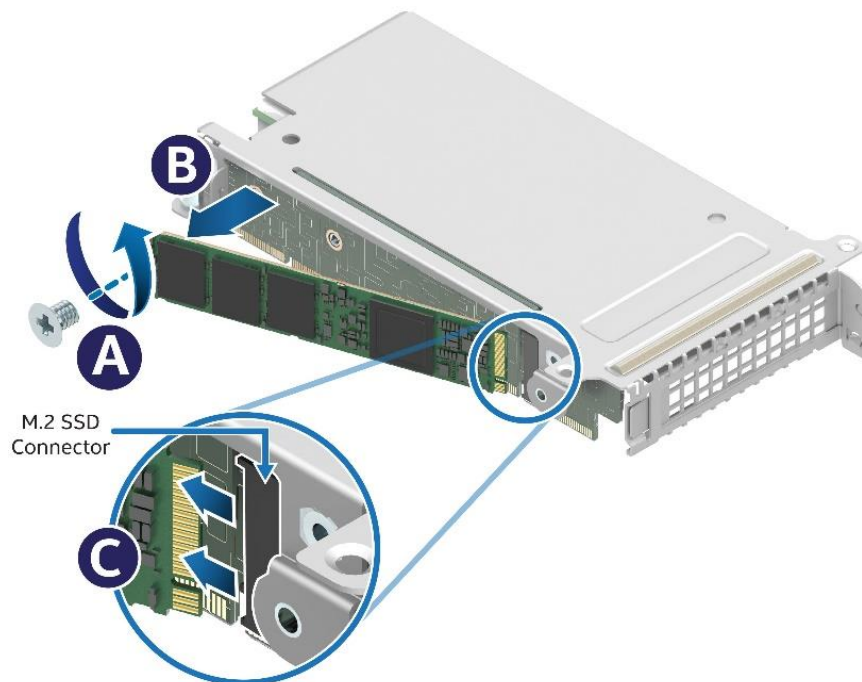
Due to the mechanical differences between the air-cooled and liquid-cooled configurations, the M.2 SSD cold plate is used to absorb the heat generated by the SSD in a liquid-cooled configuration instead of a heat sink. If the new M.2 SSD has 110 mm form factor, it requires the installation of Thermal Interface Material (TIM) (BERGQUIST™ TGP 1000VOUS) on the rear side of the M.2 SSD.



TNP40841

Figure 193. Removing the Liquid-Cooled M.2 Cold Plate

1. Locate the cold plate on the left side of the riser assembly and remove the screw (see Letter A).
2. Slide the cold plate in the direction shown to remove it (see Letter C).



Ref#: TNP40852

Figure 194. Removing liquid-Cooled M.2 SSD

3. Remove the screw from the M.2 mounting standoff on the left side of the riser assembly (see Letter A).
4. Carefully rotate outward the free end of the M.2 SSD away from the riser assembly (see Letter B).
5. Grasp the M.2 SSD by its edges and gently remove it from the connector in the direction shown (see Letter C).

If no SSD is being installed, follow steps 6 and 7. If the SSD is being replaced, skip steps 6 and 7:

6. Return the previously removed screw to the M.2 mounting standoff.
7. Reinstall the M.2 cold plate onto the riser assembly.

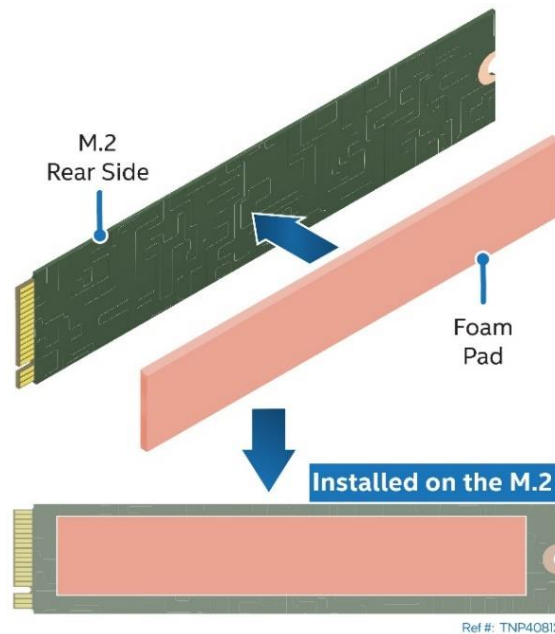


Figure 195. Installing Liquid-Cooled M.2 SSD

8. Attach the adhesive side of the Thermal Interface Material (TIM) (BERGQUIST™ TGP 1000VOUS) pad to the rear side of the M.2 SSD with 110 mm form factor. Center the pad vertically and horizontally. The TIM can be reused from the previous M.2 SSD for up to 10 times before it has to be replaced.

Note: Skip this step for M.2 SSD with 80 mm form factor

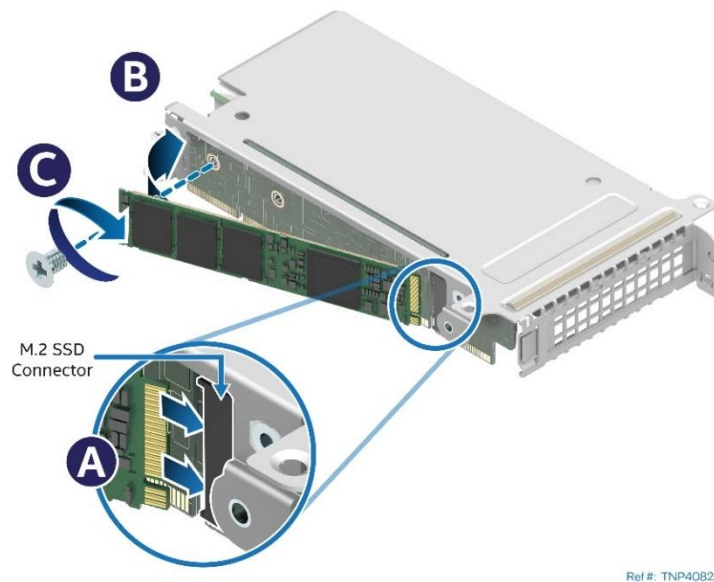


Figure 196. Installing the M.2 SSD

9. If installed, remove the screw from the M.2 mounting standoff on the left side of the riser assembly.
10. Align the notch within the SSD edge connector with the key in the M.2 connector and insert the SSD into the connector (see Letter A).
11. Push the free edge of the SSD towards the riser assembly (see Letter B) and secure the SSD to the M.2 mounting standoff with the previously removed screw (see Letter C).

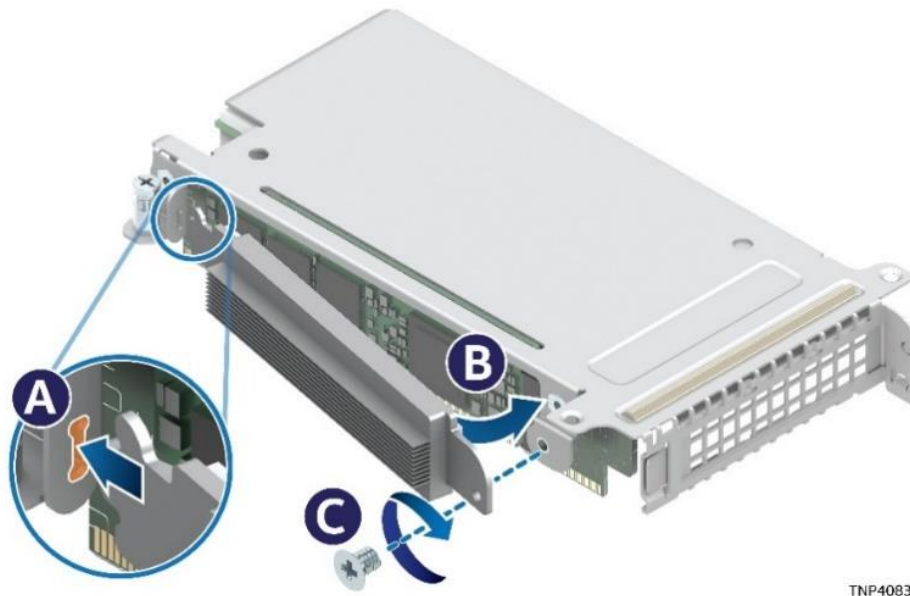


Figure 197. Installing Liquid-Cooled M.2 Cold Plate

12. If present, peel off the protective film from the thermal interface material of the M.2 cold plate.
13. Align the cold plate to the riser assembly and slide into place in the direction shown (see Letter A).
14. Ensure that the screw holes are properly aligned (see Letter B) and secure the cold plate to the riser assembly with a screw (see Letter C).

7.8 Riser Assembly Replacement

The Intel® Server System D50TNP supports either up to two (1U modules) or up to four (2U modules) low-profile PCIe* add-in cards.

This section provides assembly and installation procedures for modules that require low-profile add-in card installation. The following procedures apply to both 1U and 2U modules in both air-cooled and liquid-cooled configurations.

Note: The Accelerator Module has additional support for up to four full height, full length, double width PCIe* accelerator cards. Follow the replacement procedures in [Section 7.11](#) for those cards.

Available Riser Card Options:

- 1U riser card (installed in 1U riser assembly) for 1U module using Intel® Server Board D50TNP1SB
- 1U riser card (installed in 1U riser assembly) for 1U module using Intel® Server Board D50TNP1SBCR
- 2U riser card (installed in 2U riser assembly) for 2U module

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

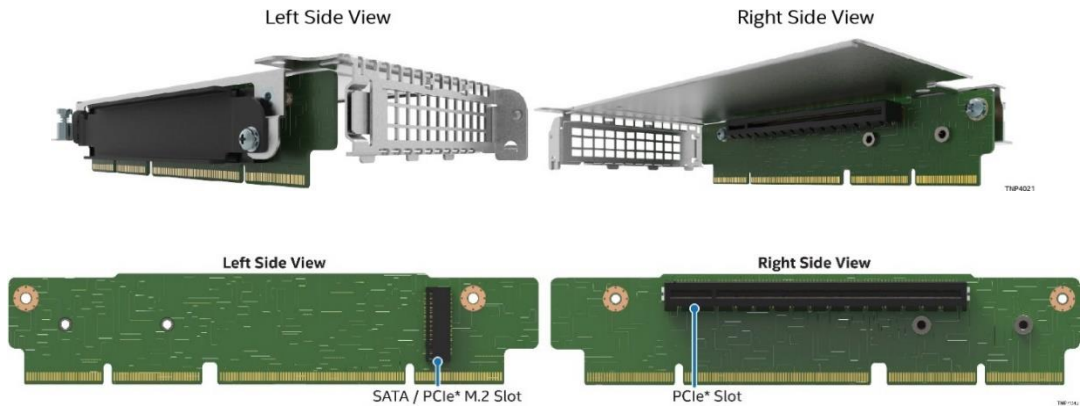


Figure 198. 1U Riser Assembly and Riser Card Features (iPCs D50TNP1MHCPAC and D50TNP2MHSTAC)

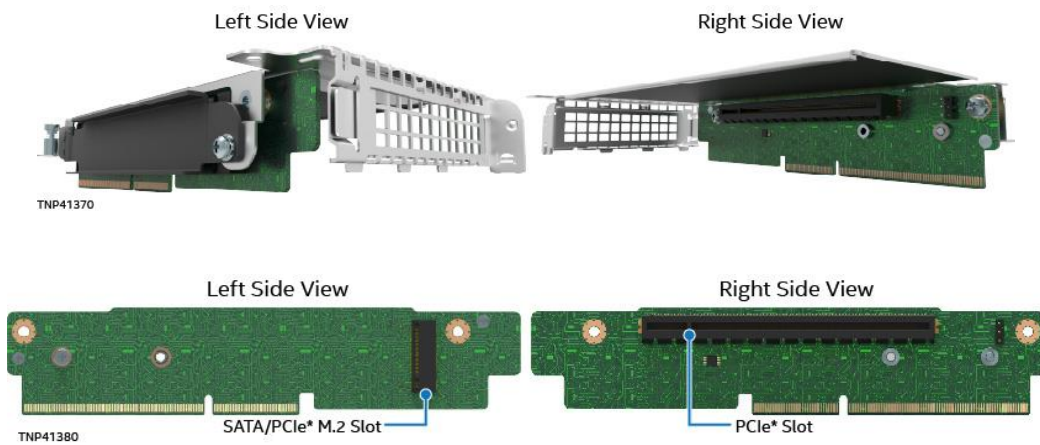


Figure 199. 1U Riser Assembly and Riser Card Features (iPCs D50TNP1MHCRCAC D50TNP1MHCRLC, and D50TNP1MHEVAC)

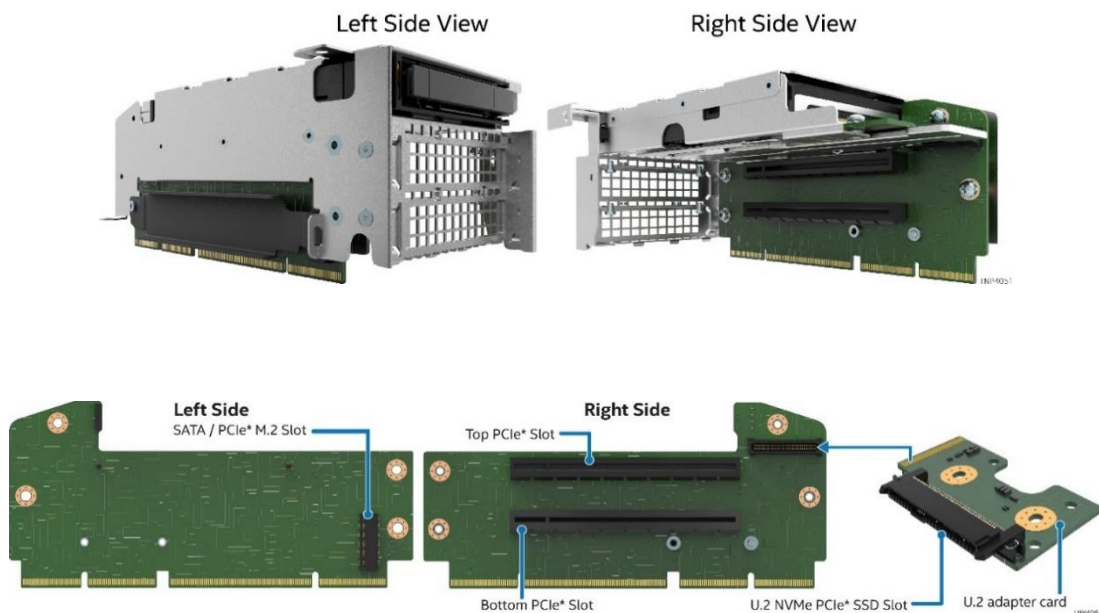


Figure 200. 2U Riser Assembly and Riser Card Features (iPCs D50TNP2MHSVAC and D50TNP2MFALAC)

7.8.1 Riser Assembly Removal

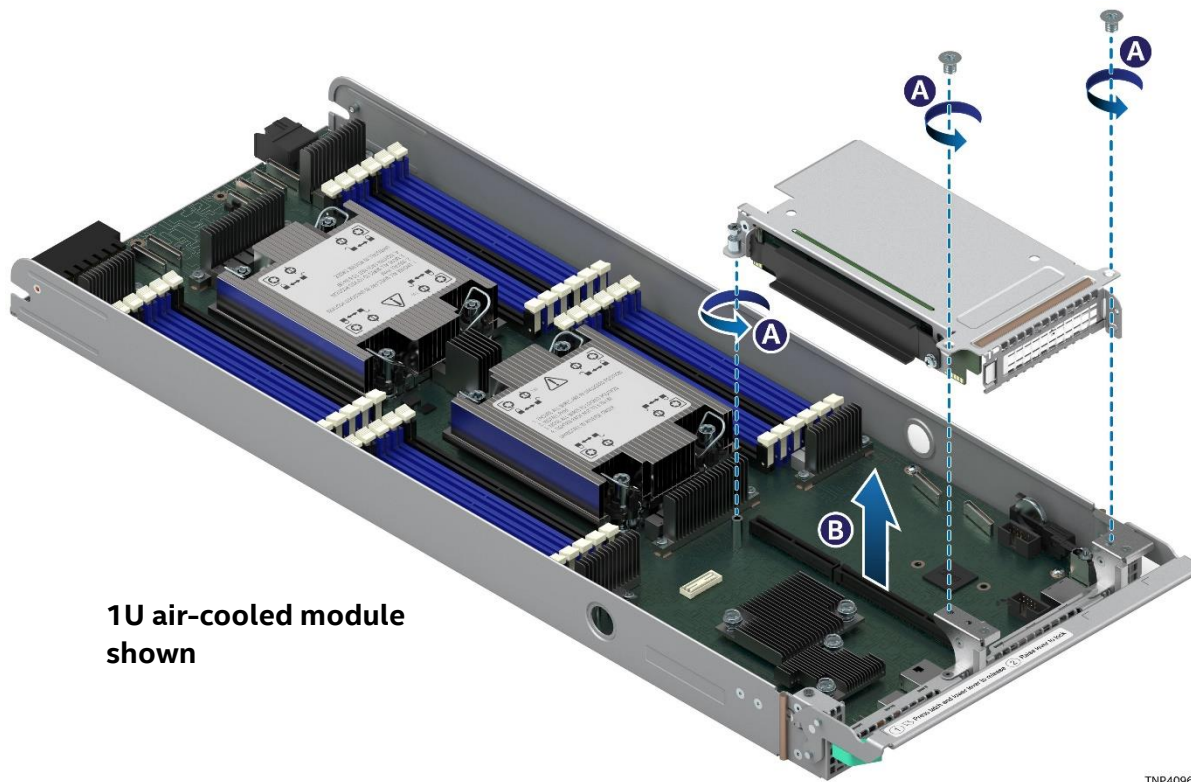


Figure 201. Removing a Riser Assembly

1. Remove the three screws that secure the riser assembly to the module (see Letter A).
2. Carefully remove the riser assembly by lifting it up and away from the module (see Letter B).

7.8.2 PCIe* Add-in Card Replacement

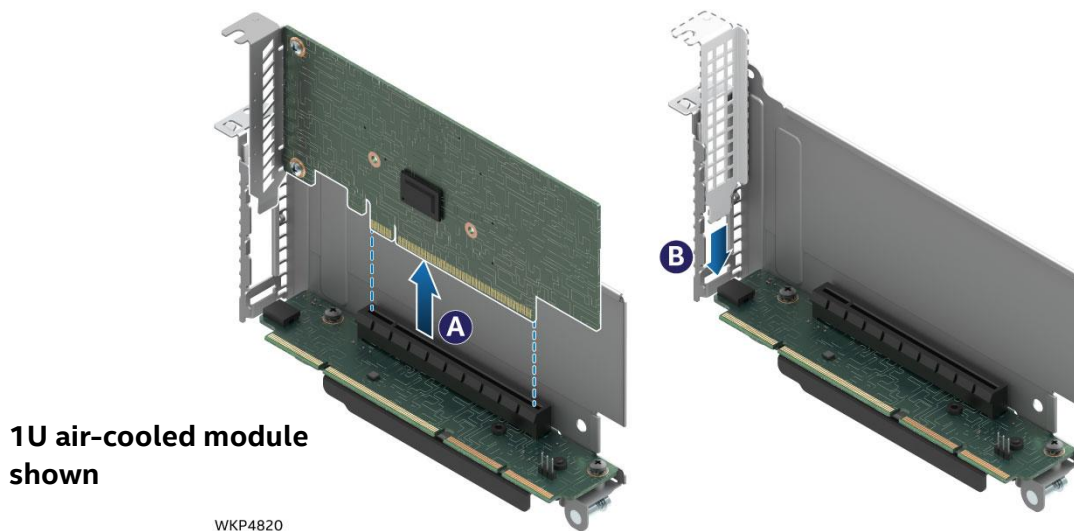
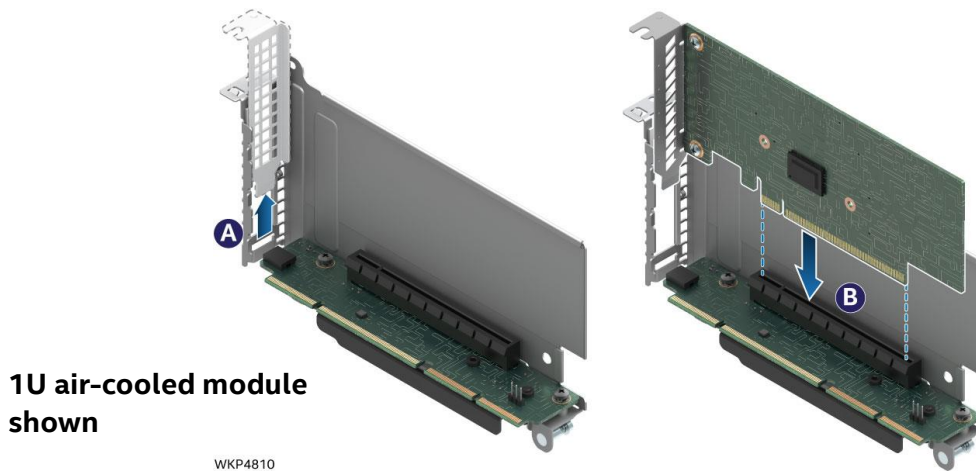


Figure 202. Add-in Card Removal

1. Carefully remove the add-in card from the PCIe* slot (see Letter A).
2. If not installing a new add-in card, carefully install the original metal filler plate over the opening on the metal frame of the riser assembly (see Letter B).



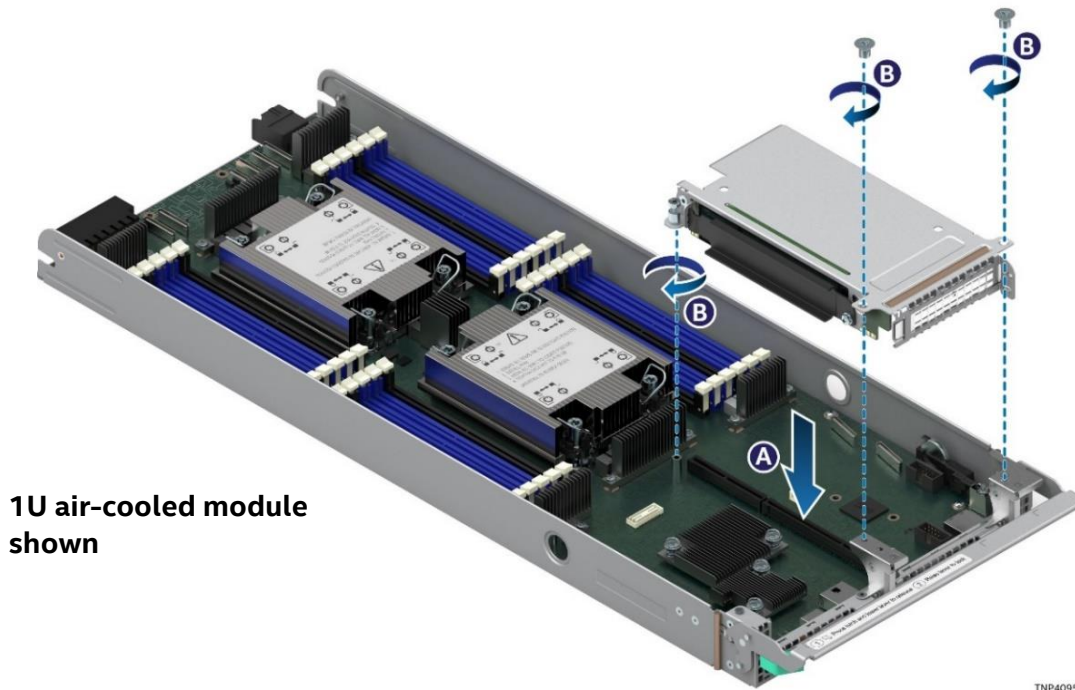
1U air-cooled module shown

WKP4810

Figure 203. Add-in Card Installation

3. If installed, carefully remove the original rear metal filler plate from the metal frame of the riser assembly (see Letter A).
4. Align the rear bracket of the add-in card to the rear opening of the riser assembly.
5. Carefully push the add-in card down into the PCIe* slot (see Letter B).
6. Ensure that the add-in card is fully seated.
7. Reinstall the riser card assembly into the module (see Section 7.8.3).

7.8.3 Riser Assembly Installation



1U air-cooled module shown

TNP40950

Figure 204. Installing a Riser Assembly

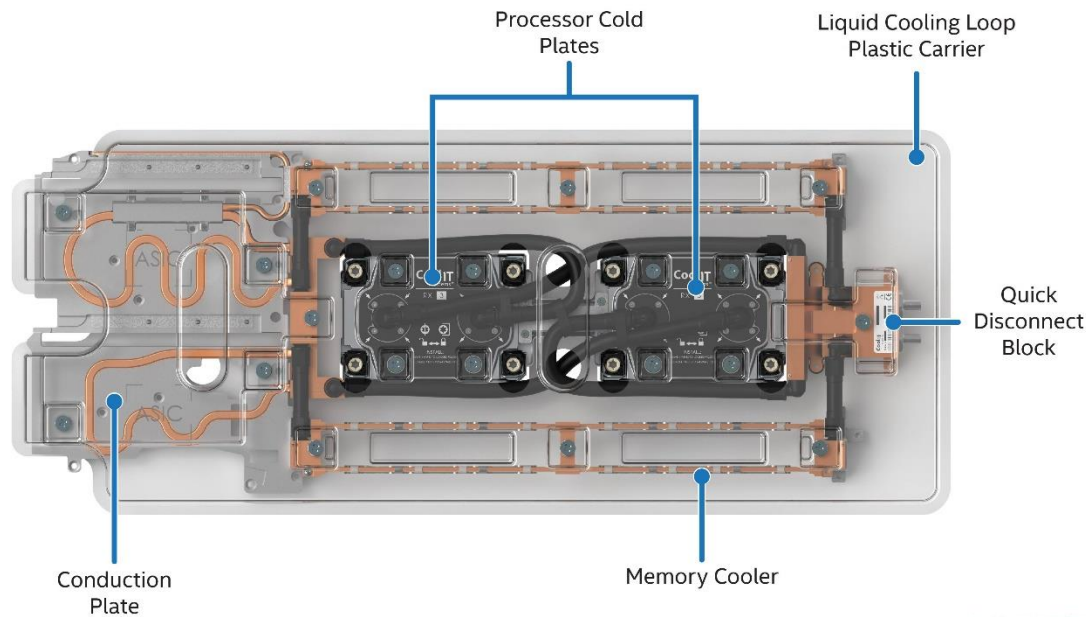
1. Align the riser card edge connector to the riser slot on the server board (see Letter A).
2. Carefully push down on the riser assembly until the riser card is securely seated into the riser slot.
3. Ensure that the three screw holes of the riser assembly are aligned and flush with the mounting holes of the module.
4. With three screws, secure the riser assembly to the module using 8 lbs. of torque on each screw (see Letter B).

7.9 Liquid-Cooling Loop Replacement (for Compute Module iPC D50TNP1MHCRLC)

The replacement of the liquid-cooling loop assumes that the processors and the processor carrier clips are already installed in the sockets.

Note: Remove all the DIMMs from the memory slots before replacing the liquid-cooling loop (see [Section 7.5.2](#)).

The cooling components for liquid-cooled systems are shown in the following figure.



Ref #: TNP41051

Figure 205. Liquid-Cooling Loop Components

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #2
- Torx* T-30 screwdriver
- D50TNP Liquid Cooling VR TIMM Application Tools (iPC TNPLCVRTL5)
- D50TNP Liquid Cooling VR TIMM Application Nozzles (iPC TNPLCVRTNZ)
- D50TNP Liquid Cooling VR TIMM Compound (iPC TNPLCVRCMPD)

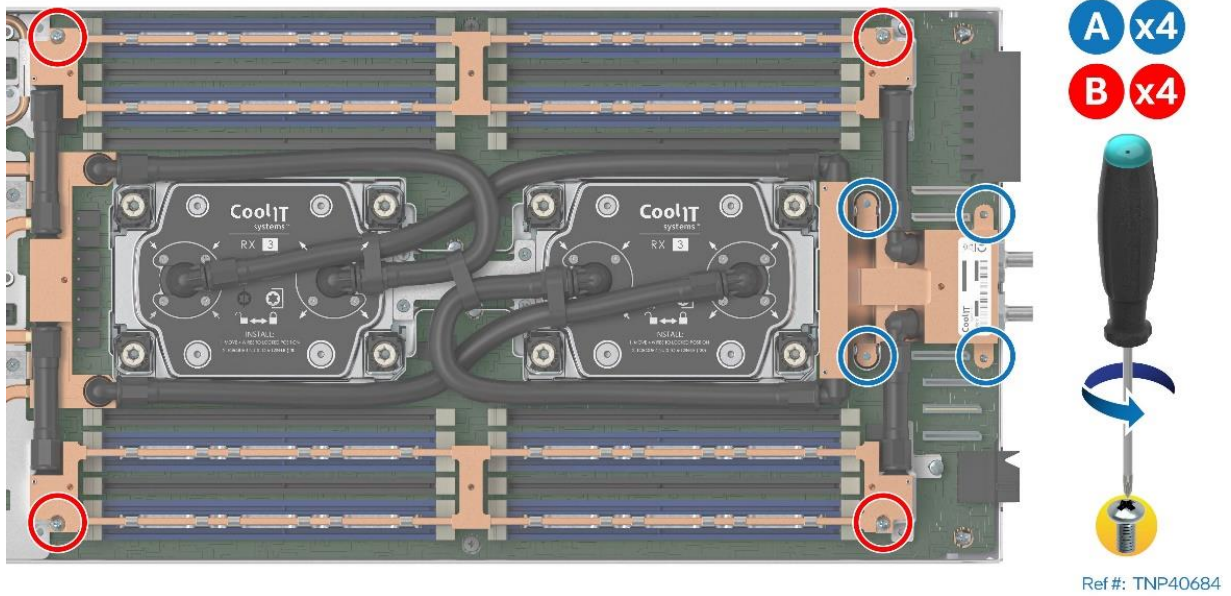


Figure 206. Removing the Screws on Quick Disconnect Block and Memory Cooler

1. Remove all fastener screws used to secure the quick disconnect block and memory cooler to the server board.

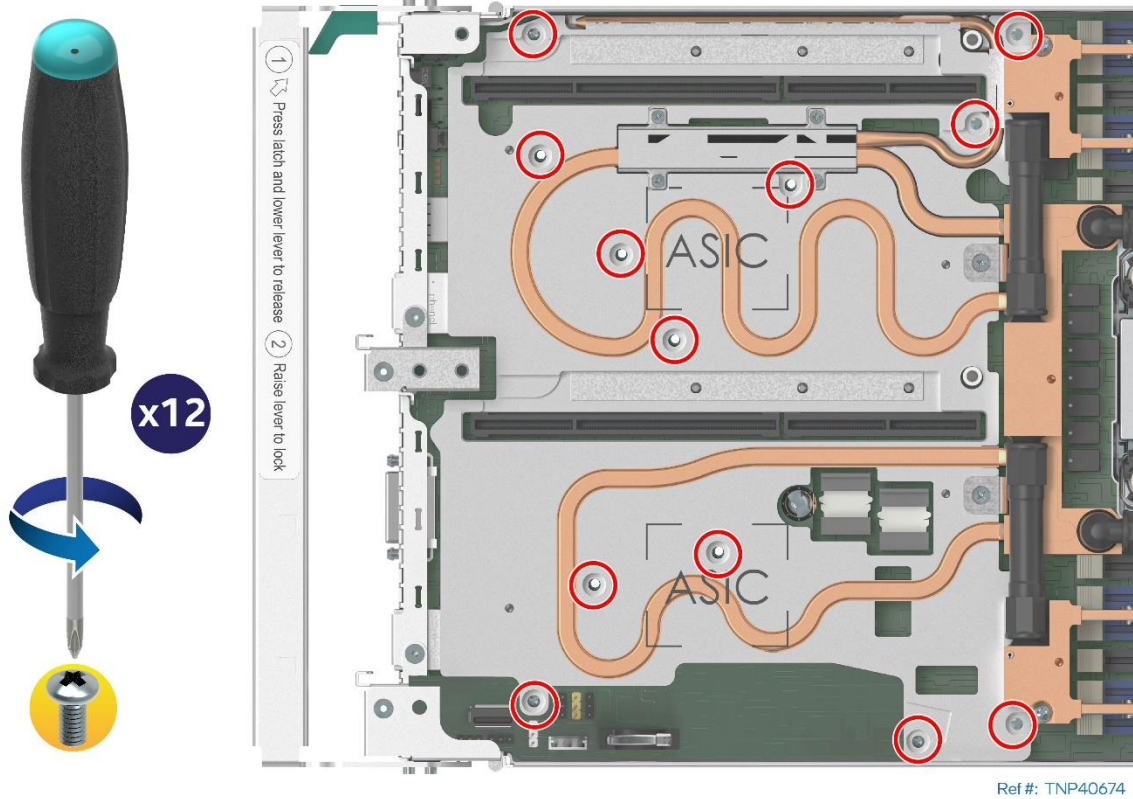
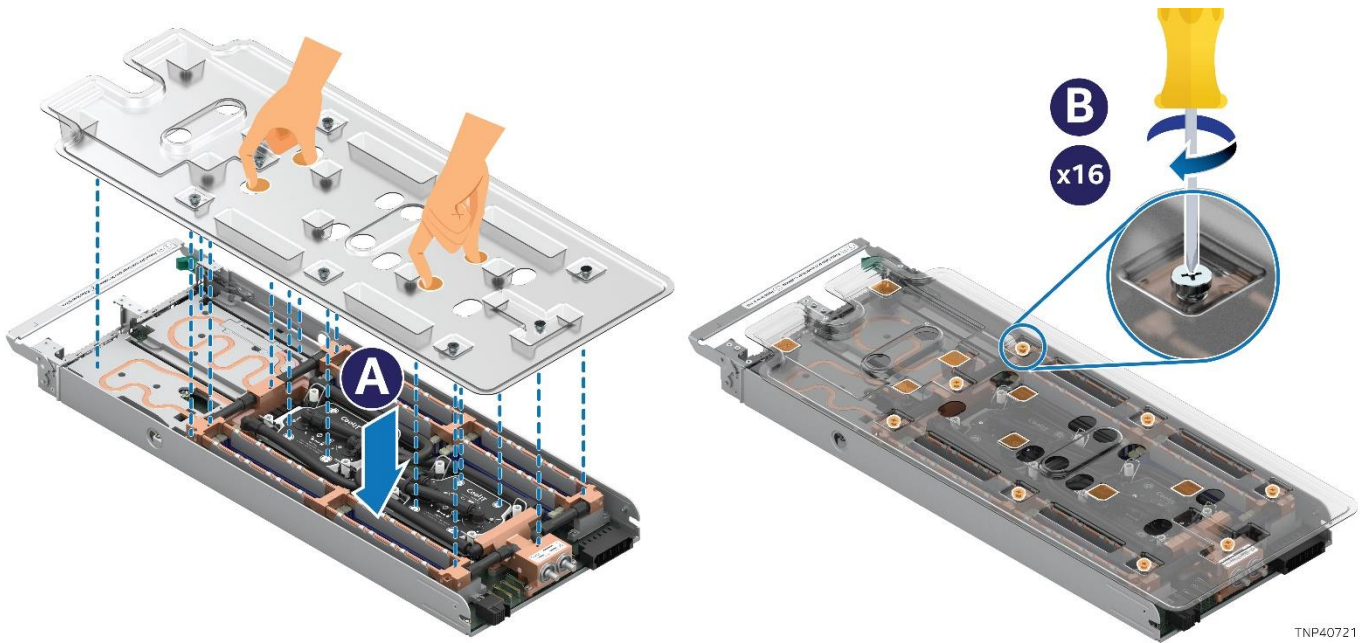


Figure 207. Removing the Screws on the Conduction Plate

2. Remove all fastener screws used to secure the conduction plate to the server board.

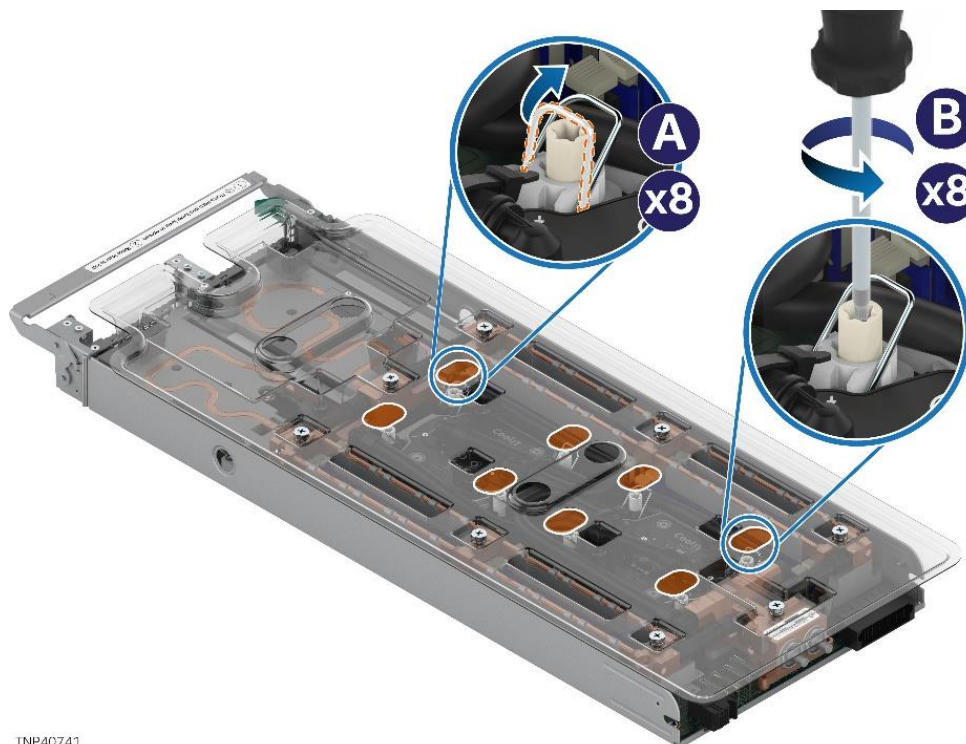


TNP40721

Figure 208. Installing the Liquid-Cooling Loop Carrier

Note: The liquid cooling loop comes from the factory with a plastic carrier attached. The carrier is used during the installation and removal of the liquid cooling loop in the module.

3. Align the captive screws on the plastic carrier with the screw holes on the liquid-cooling loop (see Letter A).
4. Fasten all the screws (see Letter B).



TNP40741

Figure 209. Loosening Processor Cold Plates

5. Ensure that all the anti-tilt wires on the cold plates are in the outward position (see Letter A).
6. Fully loosen all four fasteners on the cold plates in any order (see Letter B).

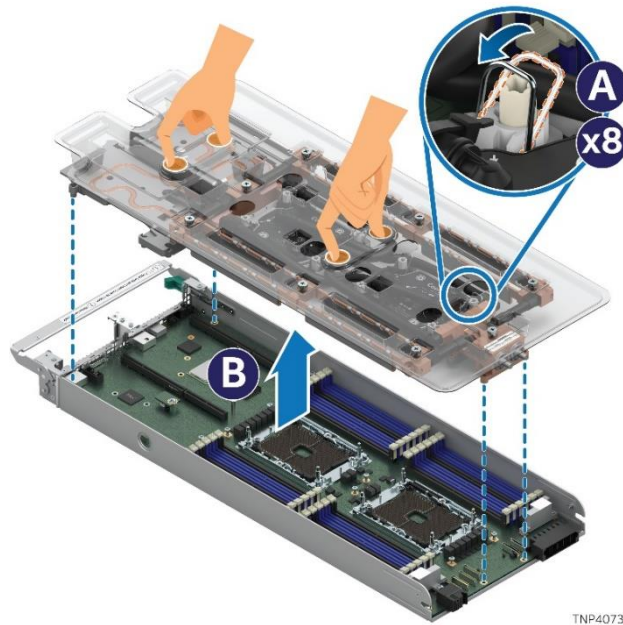


Figure 210. Removing Liquid-Cooling Loop

7. Set all the anti-tilt wires on the cold plates to the inward position (see Letter A).
8. With your fingers, hold the liquid-cooling loop carrier (with the liquid-cooling loop attached to it) and carefully lift it up and away from the module (see Letter B).
9. With the processor facing up, set the liquid-cooling loop carrier (with the liquid-cooling loop attached to it) down onto a flat surface.
10. Without touching the processor, detach the processor carrier clip from the liquid-cooling loop cold plate.
 - a. Unlatch the hook on each corner of the processor carrier clip and lift it from the cold plate.
11. Ensure that each socket is free of damage or contamination before reinstalling the processor and processor carrier clip.

Caution: If debris is observed, blow it away gently. Do not remove it manually, such as with tweezers.

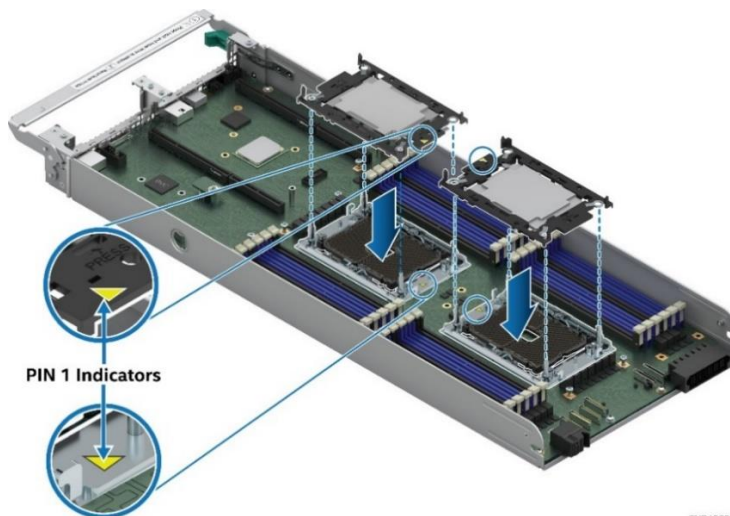
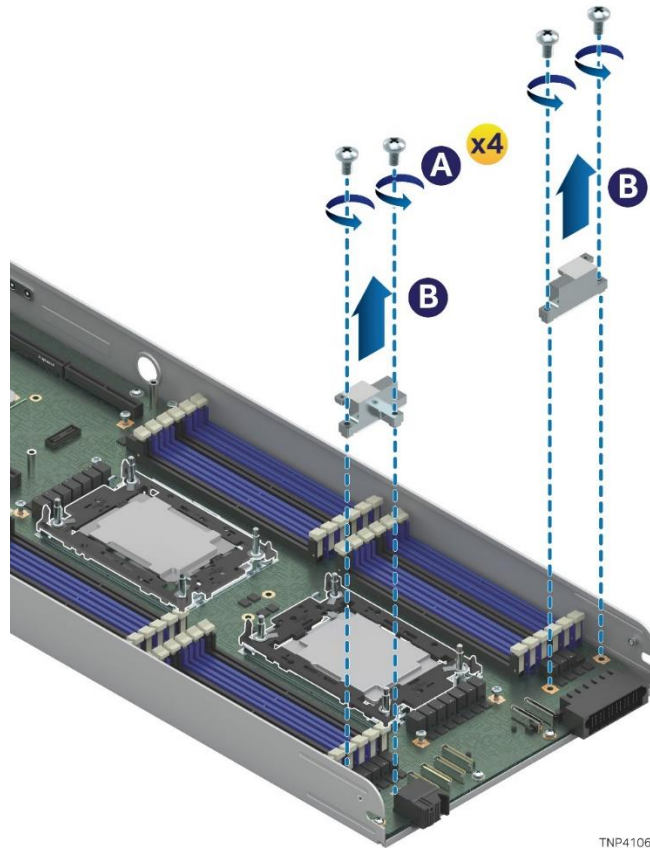


Figure 211. Align Processors and Processor Carrier Clips with Sockets

12. Align the Pin 1 indicators of the processor carrier clip and processor with the Pin 1 indicator on the bolster plate.

Caution: Processor socket pins are delicate and bend easily. Use extreme care when placing the processor and carrier clip onto the processor socket. Do not drop it.

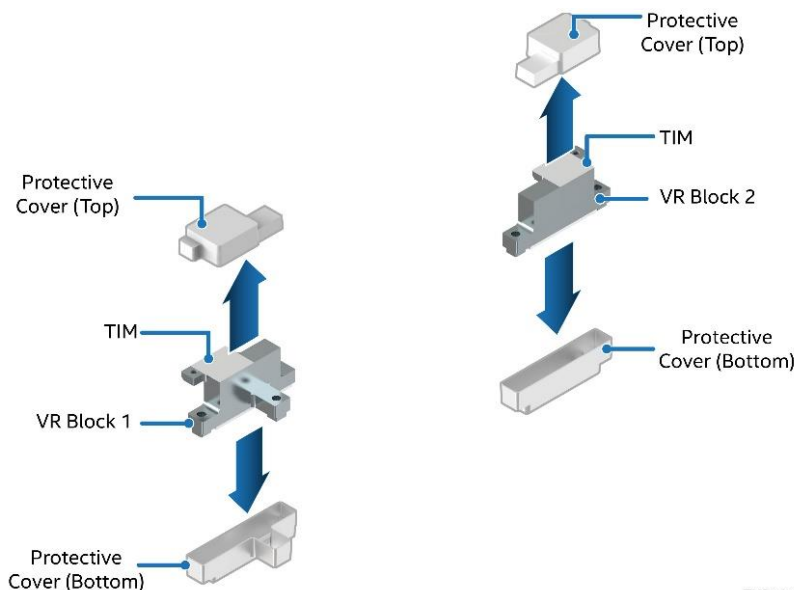


TNP41060

Figure 212. Removing Front VR Cooling Blocks

13. Remove the front Voltage Regulator (VR) cooling blocks.
14. Carefully unpack the new front VR cooling blocks from the liquid cooling loop replacement package. Remove the protective covers on both ends. Ensure that the Thermal Interface Material (TIM) is in place and intact.

Note: Follow the orientation of the front VR cooling blocks as shown in the following figure during the installation on the board.



TNP40450

Figure 213. Removing front VR Cooling Blocks Protective Covers

Note: Ensure that the TIM in the VR cooling blocks is not touched during subsequent installation steps.

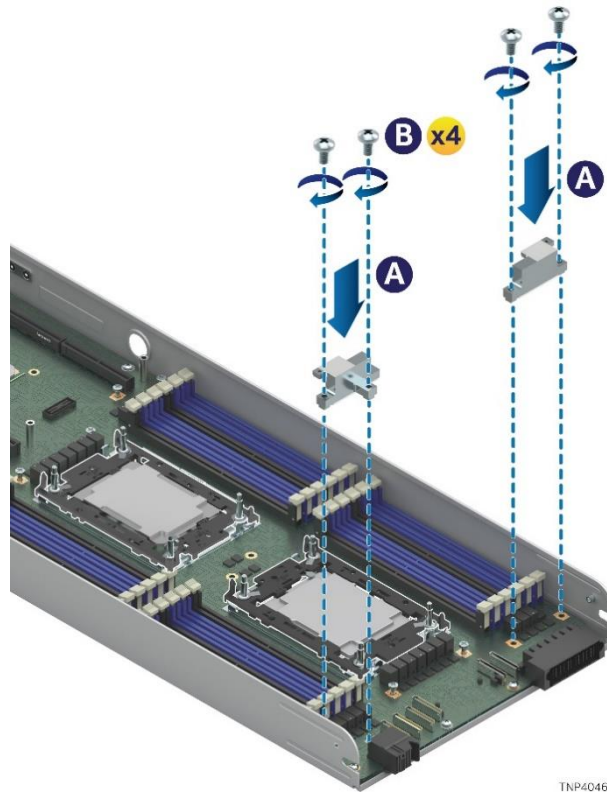


Figure 214. Installing Front VR Blocks

15. Align the front VR cooling blocks to the screw holes following the orientation shown (see Letter A).
16. Using the fastener screws, secure the front VR cooling blocks to the server board (see Letter B). Tighten to 3 in-lb.

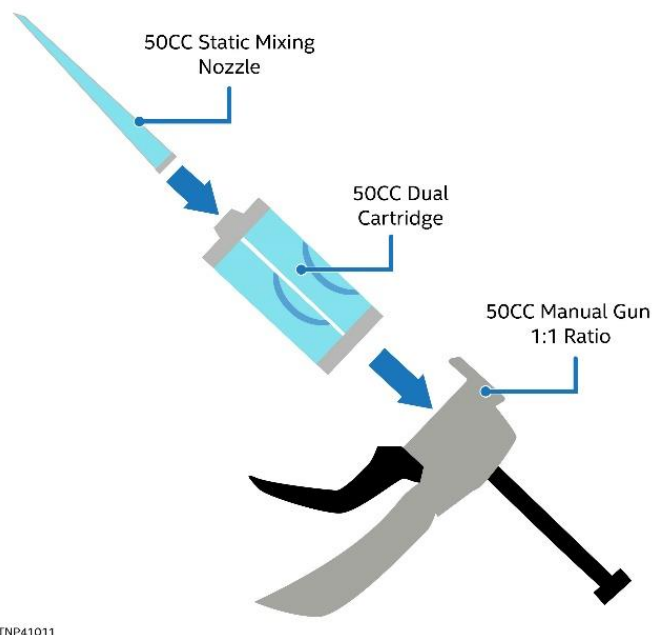


Figure 215. Assembling the Manual Applicator

17. Assemble the Bergquist SS95407 applicator, Bergquist GF3500S35 thermal gap filler cartridge, and Bergquist SS95437 nozzle as shown in the above figure.

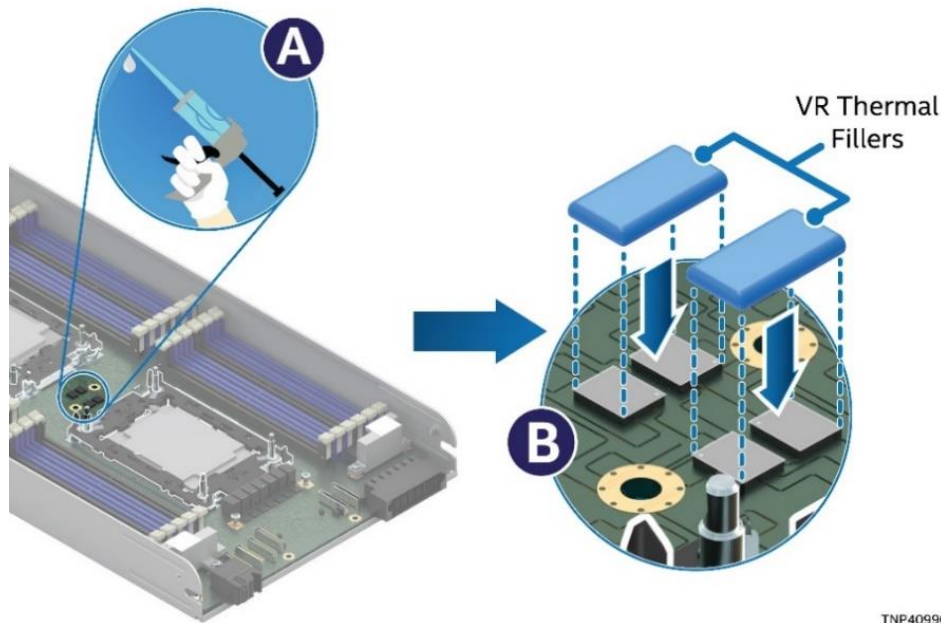


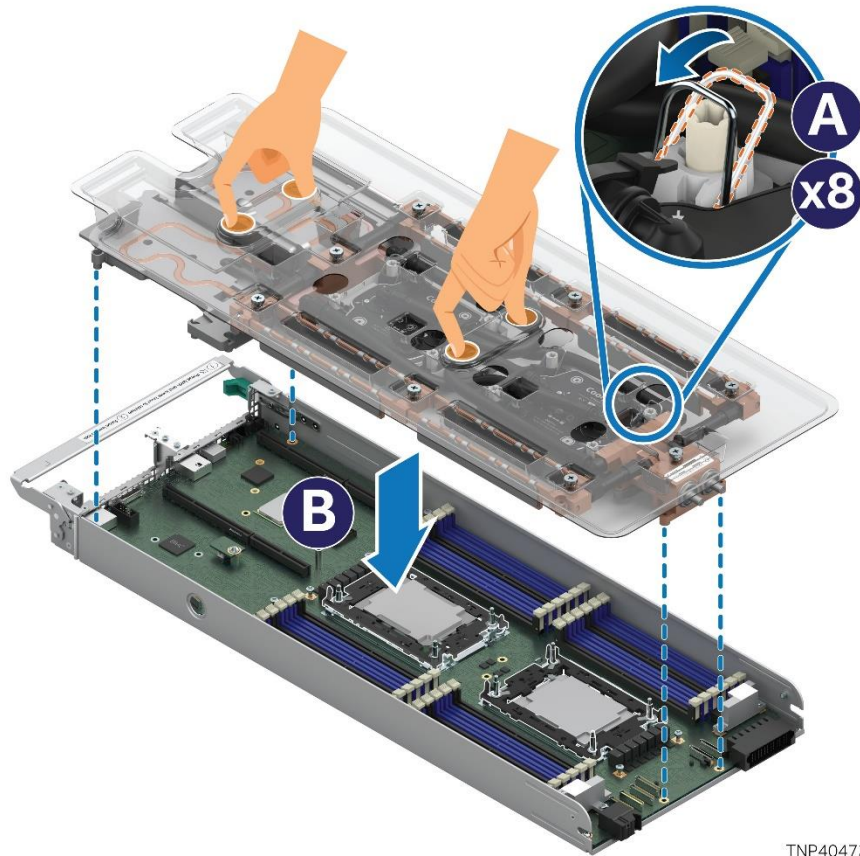
Figure 216. Applying Center VR Thermal Gap Filler

18. Using the assembled applicator (see Letter A), apply the thermal gap filler on top of center VR components (see Letter B).

Note: Apply enough thermal gap filler (~0.3 cubic centimeters) to fully cover the VR components with a minimum thickness of 1 mm.

19. Carefully unpack a new liquid-cooling loop.
 20. Remove the protective covers on the PCIe* add-in card cold plate, CPU 0 and CPU 1 cold plates, and front VR cold plate.
 21. Ensure that the Thermal Interface Material (TIM) for each cold plate is in place and the plastic protective film is removed.

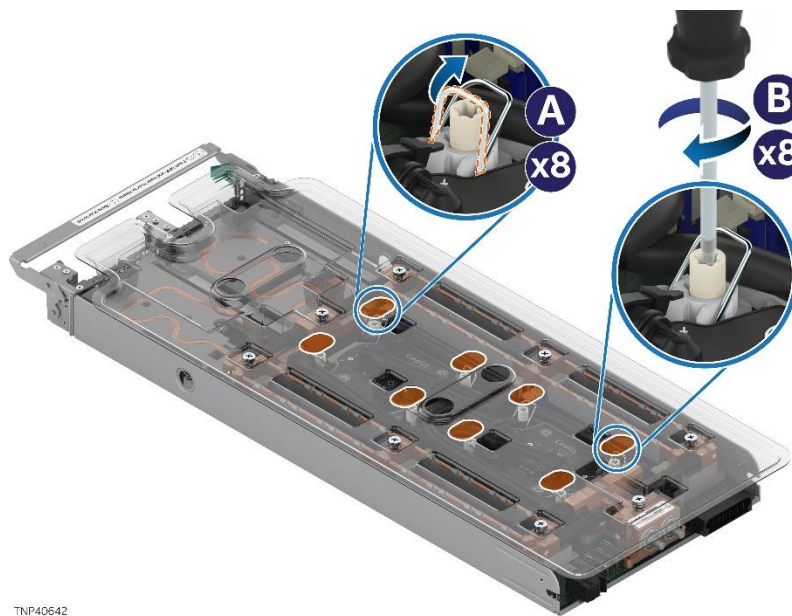
Important Note: The liquid cooling loop comes from the factory with a plastic carrier attached. The carrier is designed to be used during the installation and removal of the liquid cooling loop in the module. After the liquid cooling loop is installed in the module, the plastic carrier needs to be removed from it. Keep the plastic carrier for the liquid cooling loop removal if needed in the future.



TNP40472

Figure 217. Installing Liquid-Cooling Loop

22. Set all eight anti-tilt wires in the liquid cooling loop to the inward position (see Letter A).
23. With your fingers, hold the liquid-cooling loop carrier and carefully place it into the module (see Letter B). Ensure that the processor cold plates are properly aligned with the bolster plate's alignment pins.



TNP40642

Figure 218. Securing the Processor Cold Plates

24. Set all anti-tilt wires on the cold plates to the outward position (see Letter A).
25. Tighten the fasteners on the cold plates using a T30 Torx* screwdriver to 8 in-lb. No specific sequence is needed for tightening.

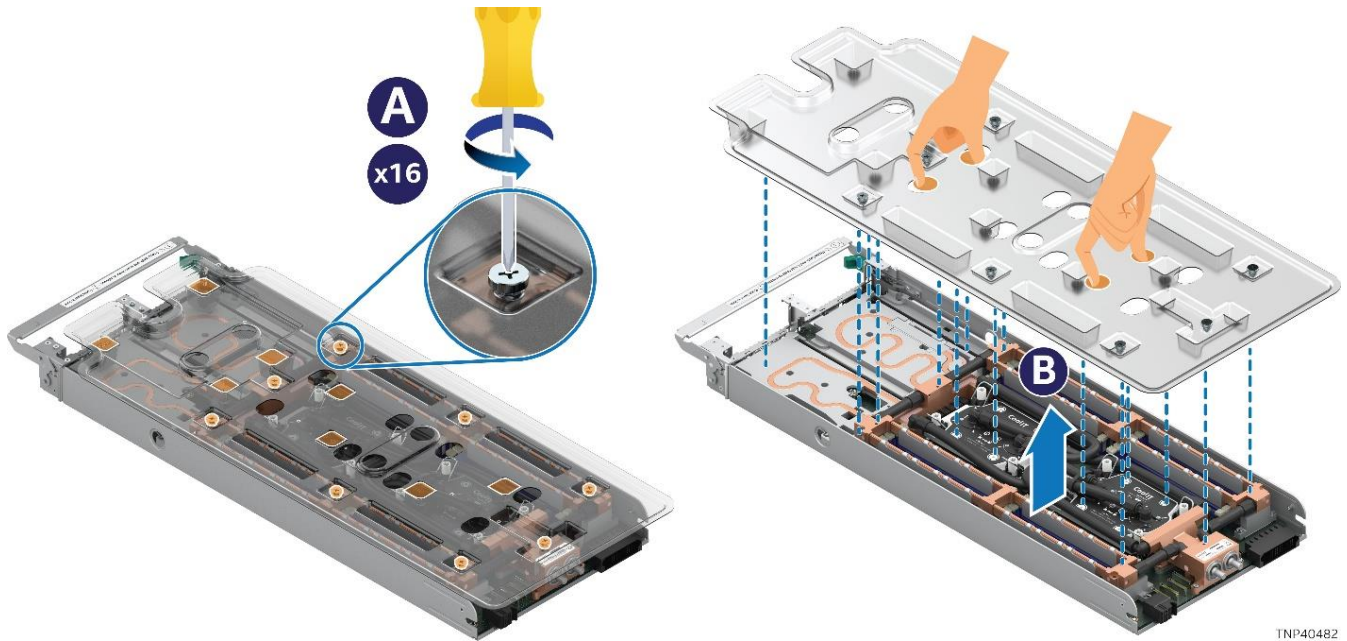


Figure 219. Removing the Liquid-Cooling Loop Carrier

26. Unscrew all 16 captive carrier screws on the plastic carrier (see Letter A) and carefully lift the carrier up and away from the module (see Letter B).

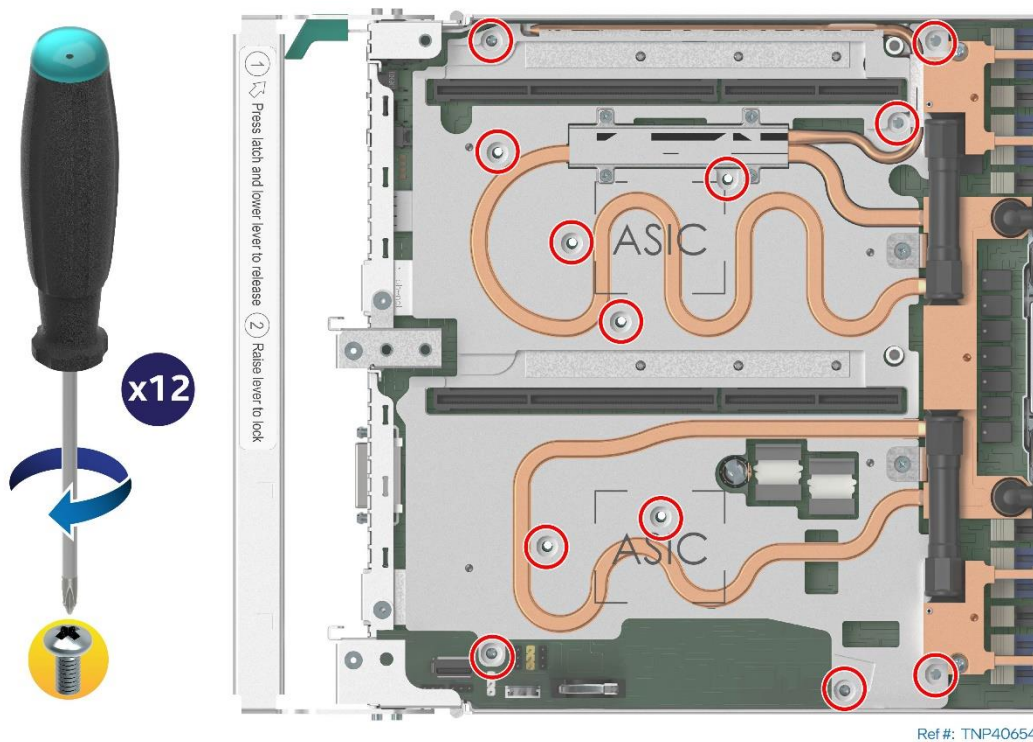


Figure 220. Securing the Conduction Plate

27. Using the fastener screws, secure the conduction plate to the server board. Tighten to 3 in-lb.

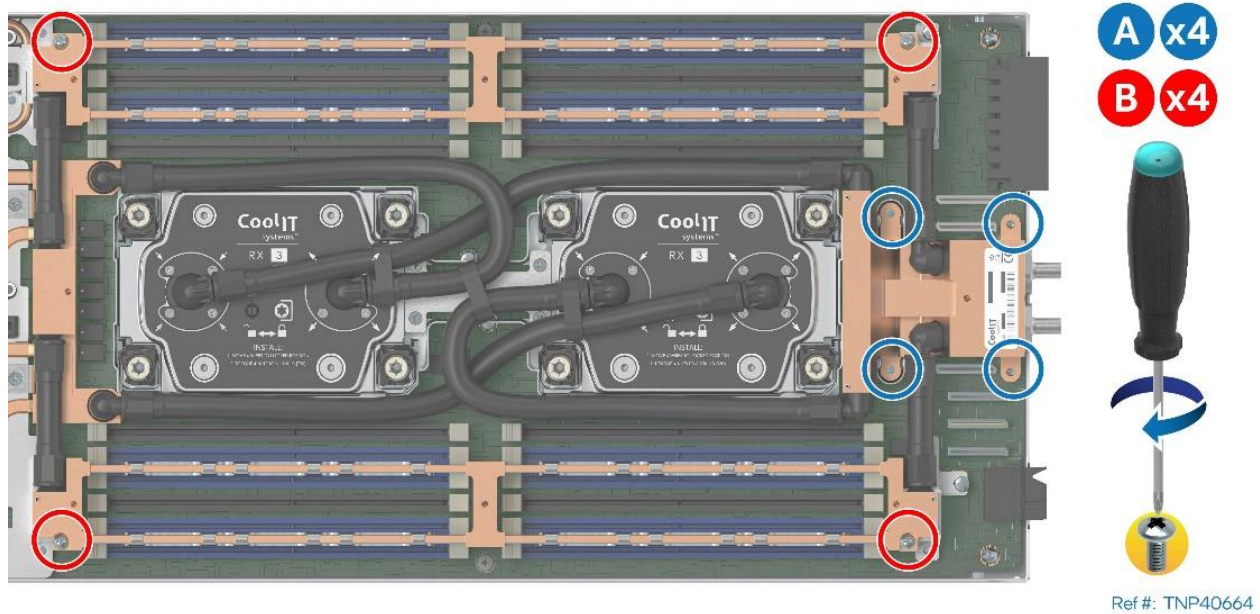


Figure 221. Securing the Quick Disconnect Block and Memory Cooler

28. Using four fastener screws (see Letter A), secure the quick disconnect block to the server board. Tighten to 3 in-lb.
29. Using four fastener screws (see Letter B), secure the memory cooler to the server board. Start threading the screws but **do not tighten** until the memory DIMMs are installed.

7.10 Mellanox Add-In Card Replacement (for Compute Module iPC D50TNP1MHCRLC)

The liquid-cooled Compute Module (D50TNP1MHCRLC) supports certain models of Mellanox add-in cards. Ensure that the replacement add-in cards are compatible with liquid-cooled modules.

Required Components:

- New Mellanox add-in cards compatible with the Intel® Server D50TNP Family liquid-cooled module

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

1. Remove the riser assembly containing the Mellanox add-in card and remove the add-in card from the riser assembly following the steps in [Section 7.8](#).
2. If not replacing the add-in card, reinstall the riser assembly.
3. On the add-in card replacement, ensure that the thermal pad is installed on top of the add-in card as shown below. Refer to the add-in card documentation for instructions to install the thermal pad.

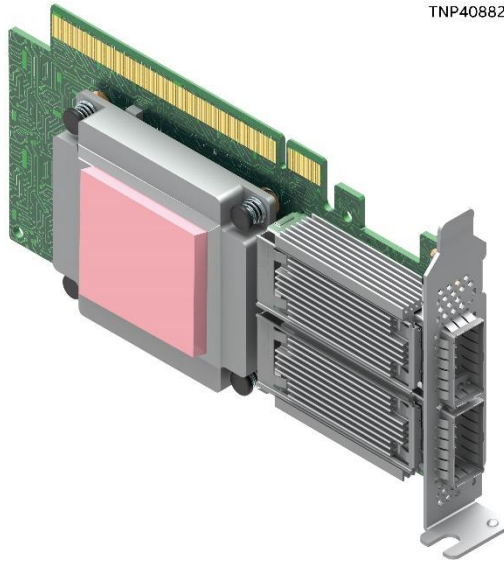


Figure 222. Mellanox Liquid Cooled Add-in Card with Thermal Pad

4. Ensure that the foam pads are installed on the bottom side of the add-in card.

If the foam pads are not installed, the following steps can be performed in conjunction with the instructions in the add-in card documentation.

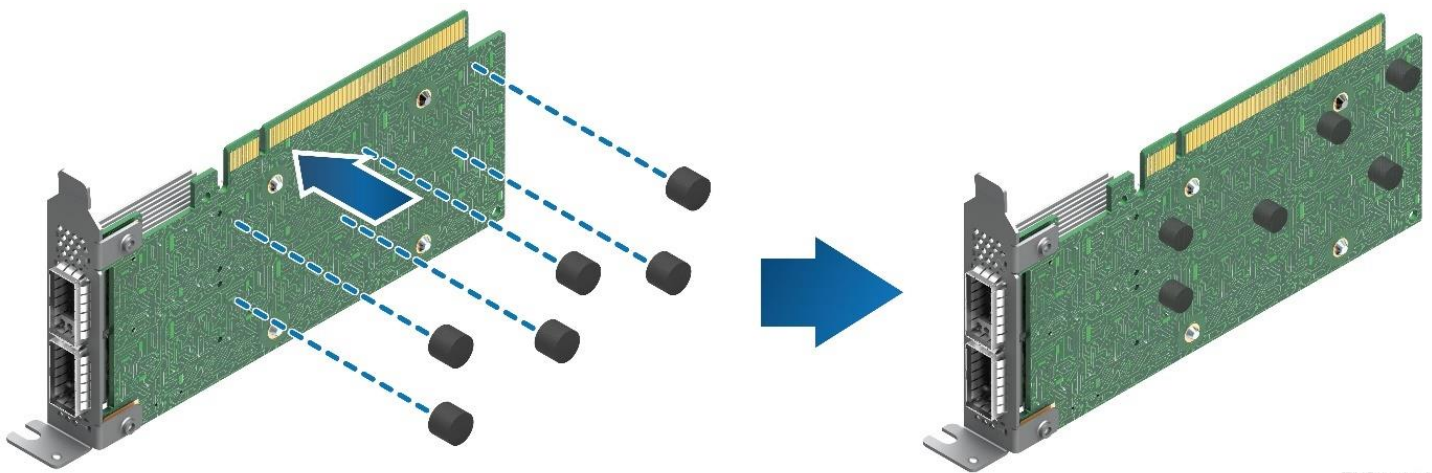


Figure 223. Installing the Mellanox Add-in Card Foam Pads

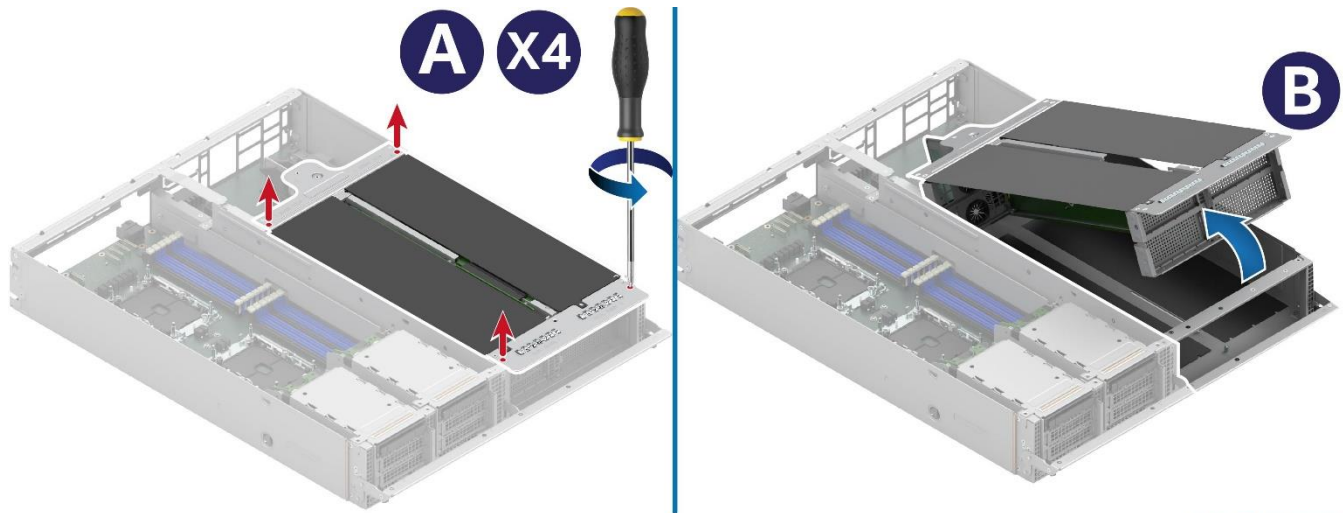
5. Prepare the foam pads and peel the liner off on the adhesive side.
6. Attach the adhesive side of the foam pads to the bottom side of the Mellanox add-in card.
7. Install the Mellanox add-in card on the riser assembly following the steps in [Section 7.8](#).

7.11 Accelerator Module Add-in Card Replacement (iPC D50TNP2MFALAC Only)

The following provides replacement instructions for the accelerator add-in cards on the Accelerator Module (D50TNP2MFALAC).

Required Tools and Supplies:

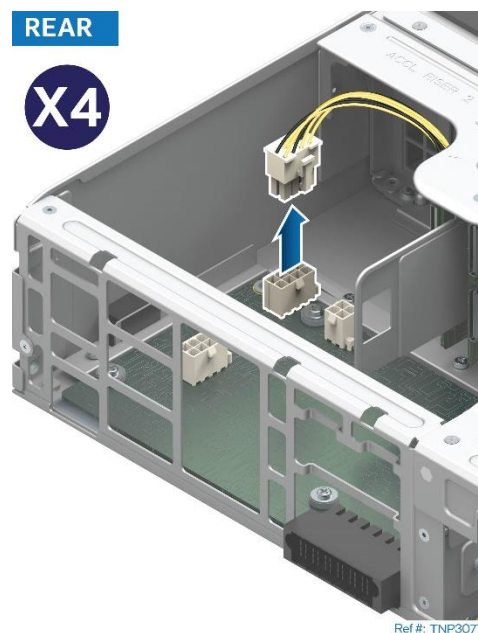
- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1



Ref #: TNP30890

Figure 224. Removing the Accelerator Module Riser Assembly

1. Loosen the four captive screws on the Accelerator Module assembly (see Letter A).
2. Carefully lift the Accelerator Module riser assembly up slightly. Then, tilt the front side away from the module (see Letter B).



Ref #: TNP30711

Figure 225. Disconnecting Add-in Card Power Cable

3. Disconnect all accelerator add-in card power cables from the connectors on the power board.

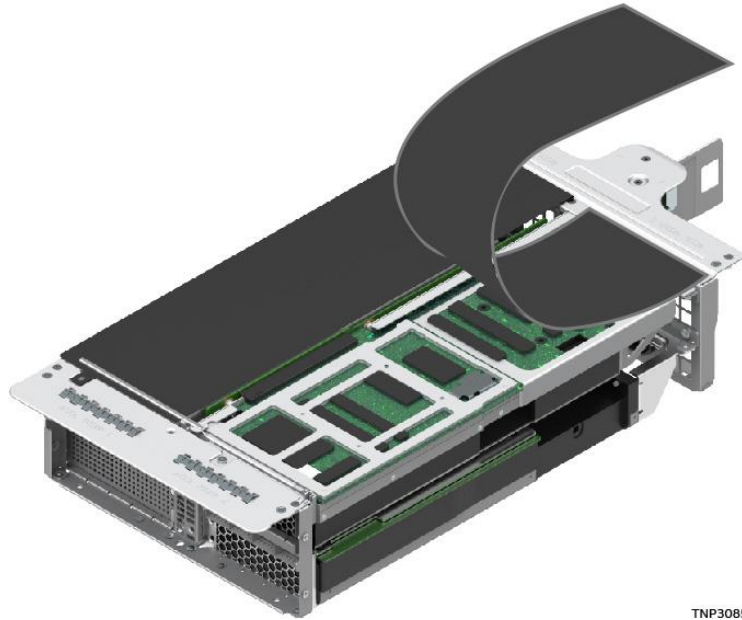
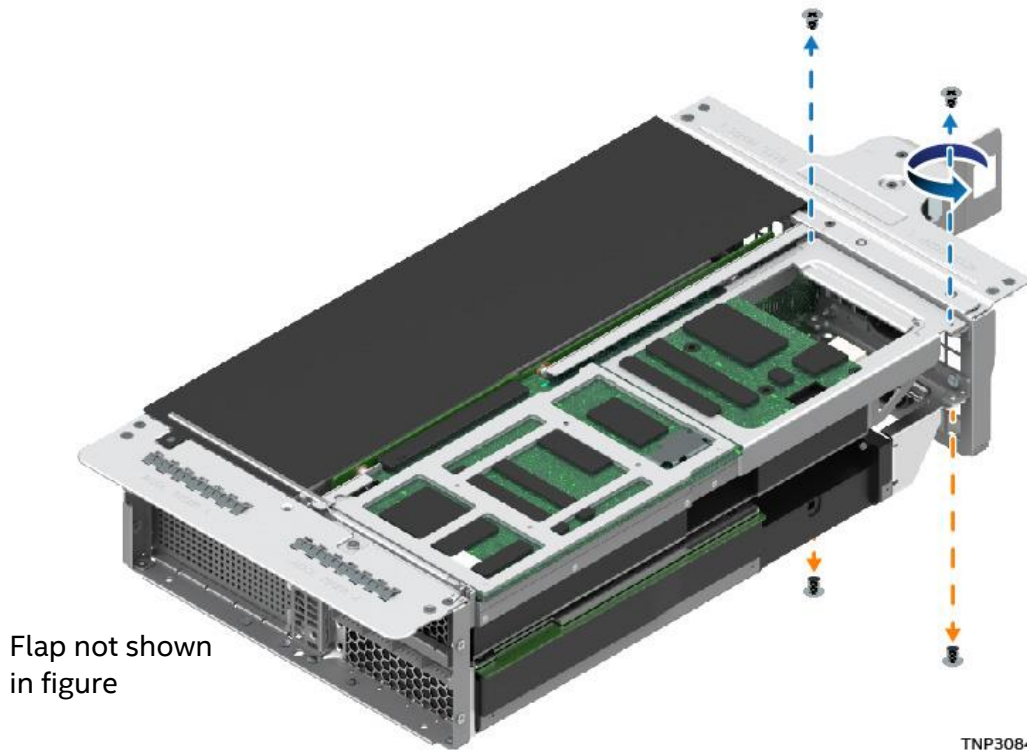


Figure 226. Lifting the Flap up on the Front Side of the Riser Assembly

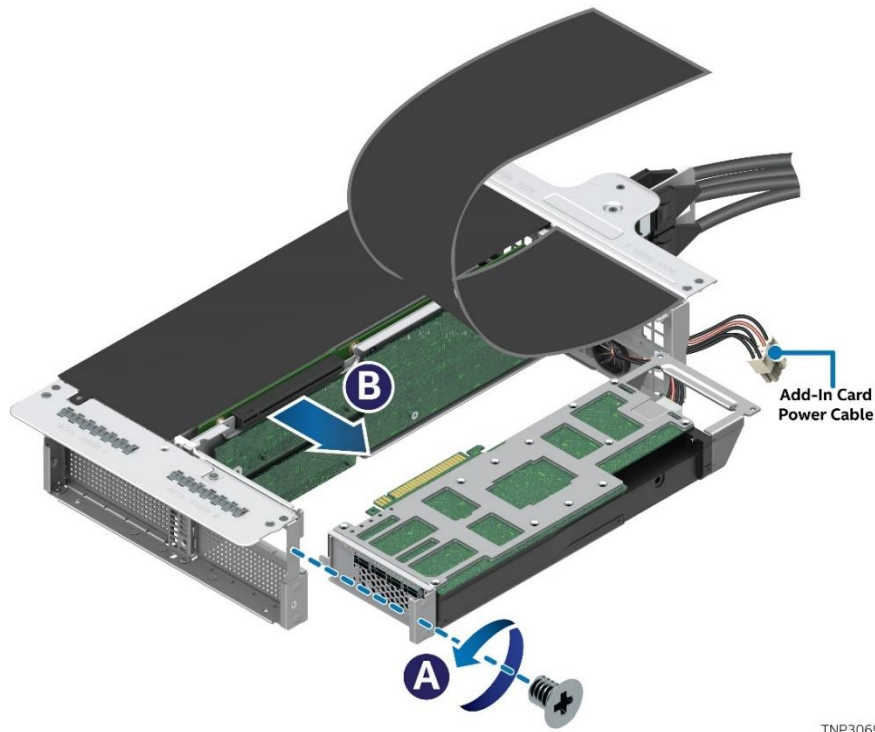
4. Remove the screw that holds the flap and lift the flap up on the front side of the riser assembly.



Flap not shown
in figure

Figure 227. Detaching the Accelerator Add-in Card from the Riser Assembly

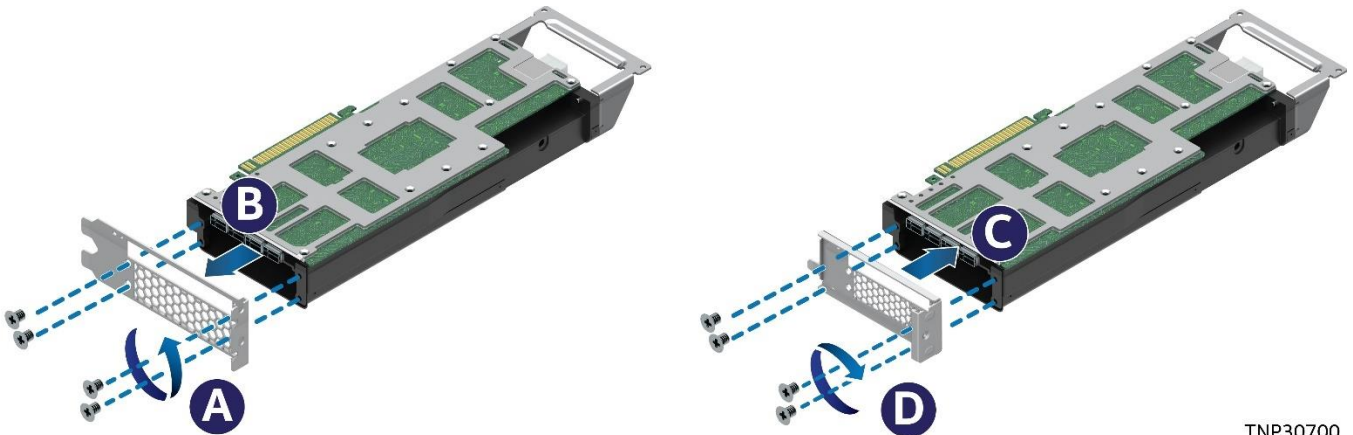
5. Remove the two screws on each corner of the back side to detach the accelerator add-in card from the riser assembly.



TNP30690

Figure 228. Removing the Accelerator Add-in Card from the Riser Assembly

6. Remove the screw on the metal bracket of the existing accelerator add-in card (see Letter A).
7. Carefully disengage the add-in card from the PCIe* slot and pull it away from the riser assembly (see Letter B).



TNP30700

Figure 229. Replacing the Add-in Card Metal Bracket

Note: The following steps to replace the accelerator add-in card metal bracket should be performed along with the instructions in the add-in card documentation.

8. Remove the screws that hold the original metal bracket on the new accelerator add-in card (see Letter A).
9. Uninstall the original metal bracket (see Letter B) from the new accelerator add-in card and replace it with the metal bracket from the existing add-in card (see Letter C).
10. Fasten the screws to secure the metal bracket to the new add-in card (see Letter D).
11. If the existing accelerator add-in card has the extension bracket, remove it and install it on the new accelerator add-in card.

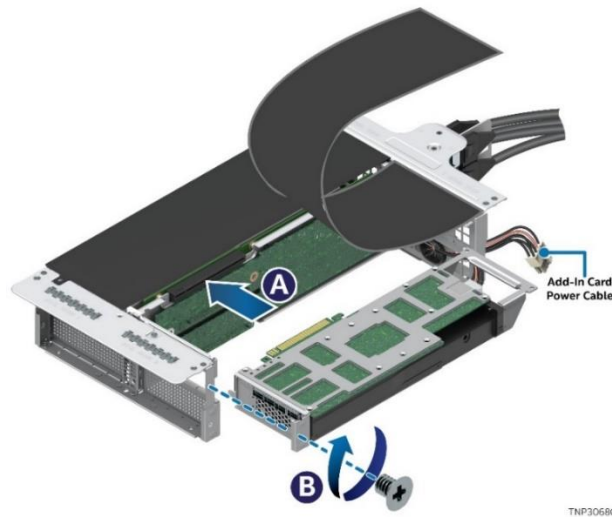


Figure 230. Installing the Accelerator Add-in Card in the Riser Assembly

12. Align the bracket of the accelerator add-in card with the opening of the riser assembly.
13. Install the power cables on the new add-in card.
 - a. Route the accelerator add-in card power cable through the plastic shield opening in the rear of the riser assembly.
14. Carefully push the add-in card into the PCIe* slot (see Letter A). Ensure that the add-in card is fully seated.
15. Fasten the screw on the metal bracket to secure the accelerator add-in card to the riser assembly (see Letter B).

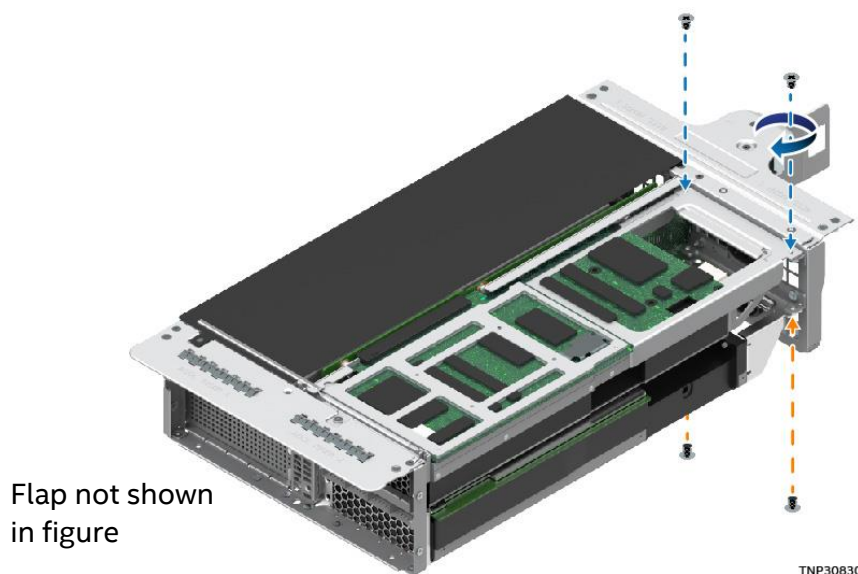


Figure 231. Securing the Accelerator Add-in Card in the Riser Assembly

16. Fasten the two screws on each corner of the back side to firmly attach the accelerator add-in card to the riser assembly.

Note: The direction of the screws on the back side depends on whether the accelerator add-in card is in the top slot or bottom slot of the riser assembly.

17. Repeat [steps 3](#) through [16](#) to replace other accelerator add-in cards as needed.
18. Install the screw that holds the flap on the front side of the riser assembly.

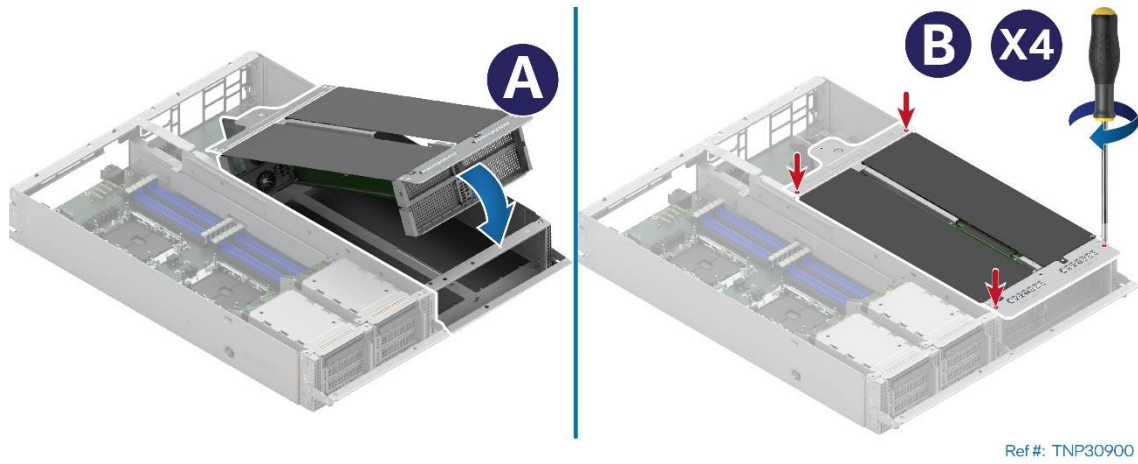


Figure 232. Installing the Accelerator Module Riser Assembly

19. Install the Accelerator Module riser assembly by tilting the front side back down to the module (see Letter A).
20. Fasten the captive screws to secure the Accelerator Module riser assembly to the module (see Letter B).

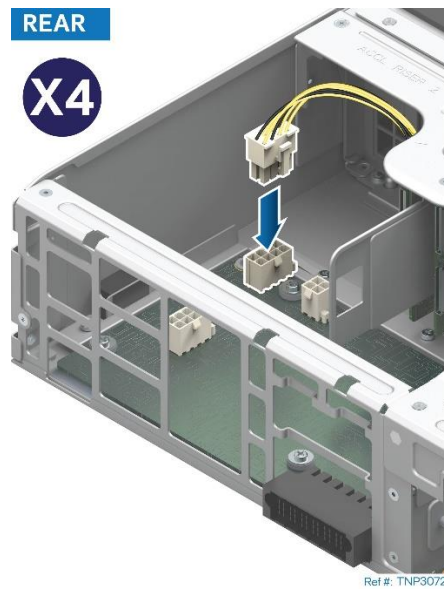


Figure 233. Connecting Add-in Card Power Cable

21. Connect all accelerator add-in card power cables to the connectors on the power board.

7.12 Accelerator Module Riser Card Replacement (iPC D50TNP2MFALAC Only)

The following provides instructions to replace the riser cards for the accelerator add-in card on the Accelerator Module (D50TNP2MFALAC).

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdrivers #1 and #2

1. Tilt the accelerator riser assembly up away from the Accelerator Module. Follow [steps 1 and 2 of Section 7.11](#).
2. Remove the accelerator add-in card from the accelerator riser assembly. Follow [steps 3 through 7 of Section 7.11](#).

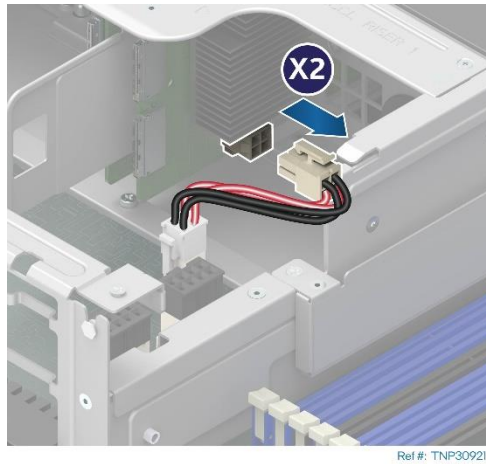


Figure 234. Disconnecting the Riser Card Power Cable

3. Disconnect the power cable from the accelerator riser card to be replaced.

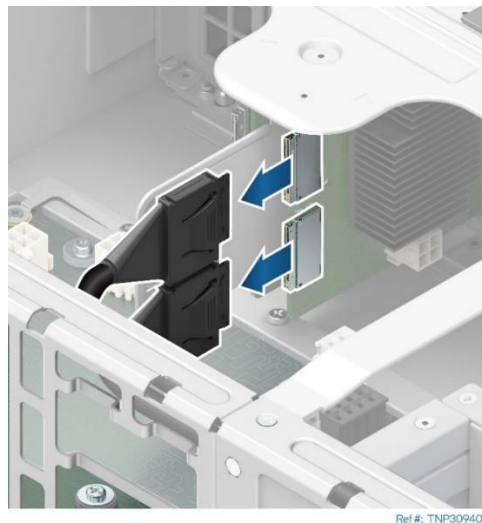


Figure 235. Disconnecting the Riser Card Power OCuLink Cables

4. Disconnect all riser card power OCuLink cables from the connectors on the accelerator riser cards.

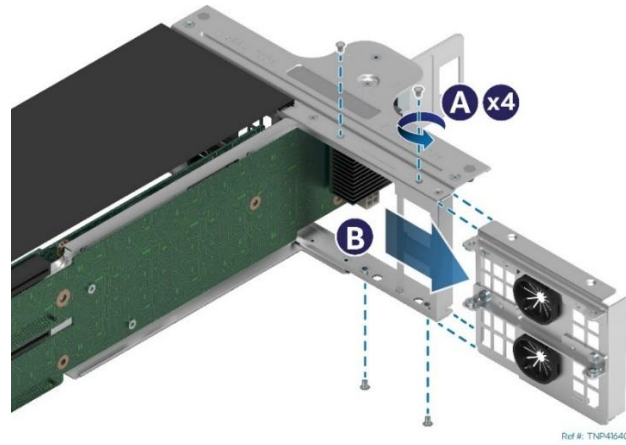


Figure 236. Accelerator Riser Assembly Rear Bracket Removal

5. Using Phillips* head screwdriver #1, remove the screws that secure the rear bracket to the riser assembly (see Letter A).
6. Slide the rear bracket and remove it from the riser assembly (see Letter B).

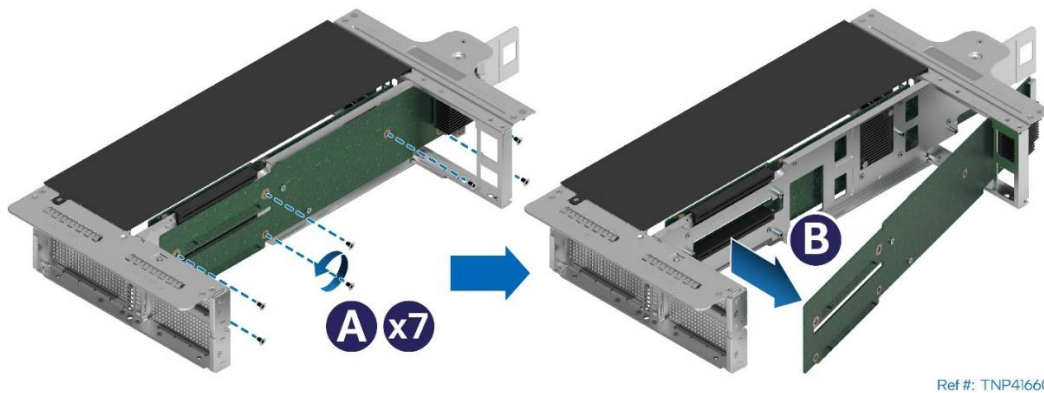


Figure 237. Accelerator Riser Card Removal

7. Using Phillips* head screwdriver #2, remove the screws that secure the accelerator riser card to the riser assembly (see Letter A).
8. Remove the accelerator riser card away from the riser assembly (see Letter B).

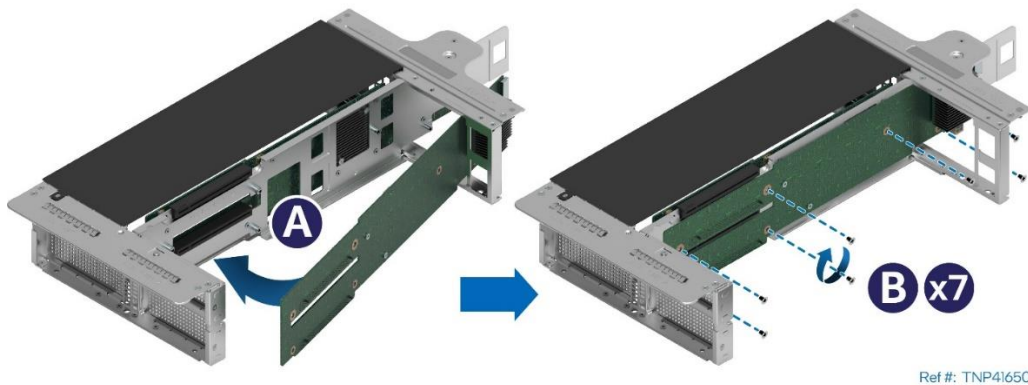


Figure 238. Accelerator Riser Card Installation

9. Locate and unpack the new accelerator riser card for replacement.
10. Slide the accelerator riser card in and align it with the screw holes on the riser assembly (see Letter A).
11. Using Phillips* head screwdriver #2, fasten the screws to secure the accelerator riser card to the riser assembly (see Letter B).

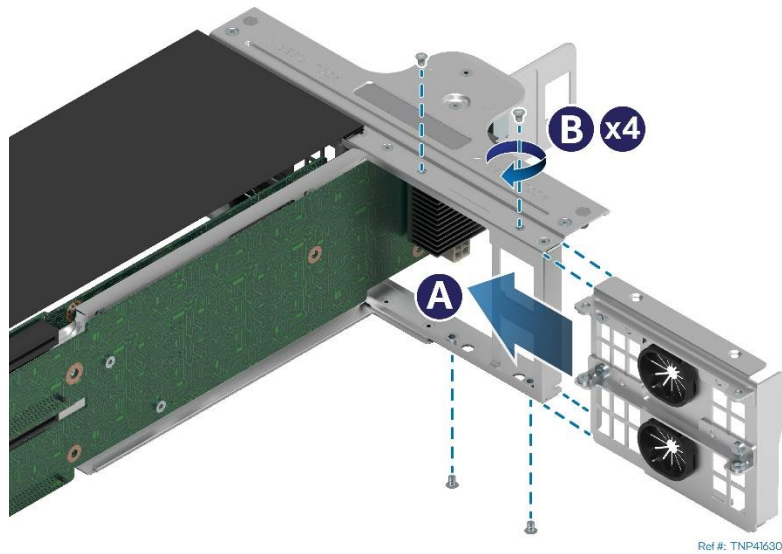


Figure 239. Accelerator Riser Assembly Rear Bracket Installation

12. Slide the rear bracket into the riser assembly (see Letter A).
13. Using Phillips* head screwdriver #1, fasten the screws to secure the rear bracket to the riser assembly (see Letter B).

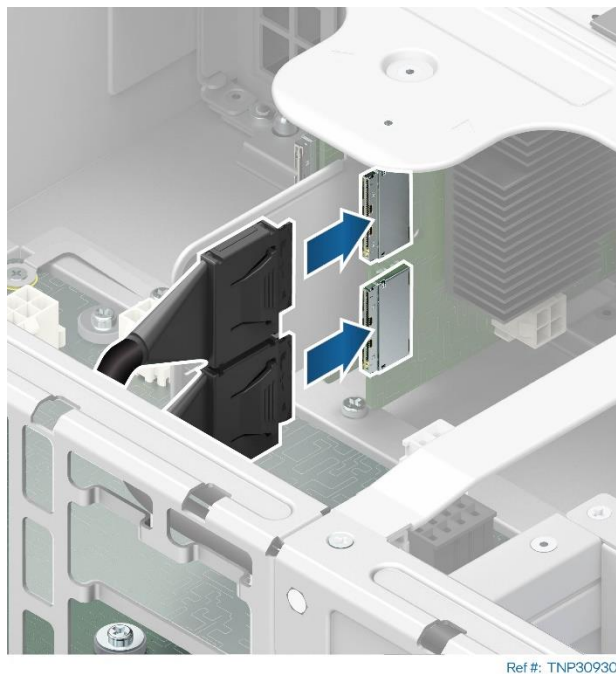
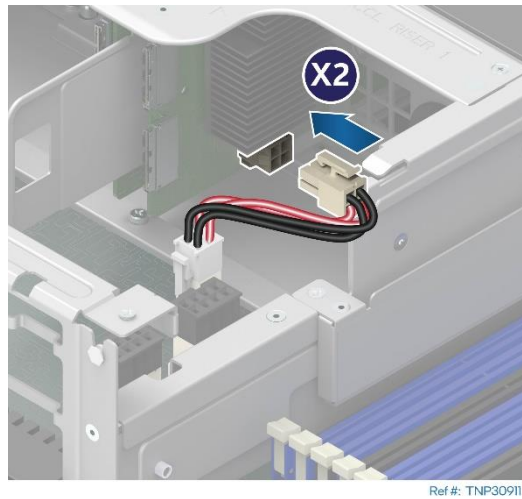


Figure 240. Connecting the OcuLink Power Cables

14. Connect all the OcuLink power cables to the connectors on the accelerator riser cards.

Note: Each OcuLink cable has the number printed on it. Connect each OcuLink cable to the OcuLink connector on the accelerator riser cards that has the same number.



Ref #: TNP30911

Figure 241. Connecting the Riser Card Power Cables

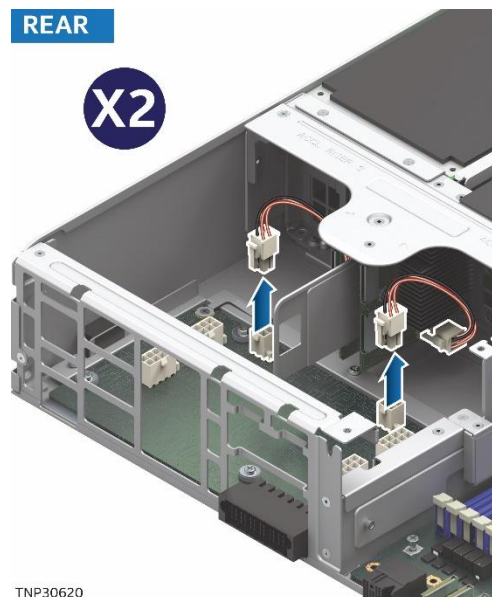
15. Connect the power cable to the accelerator riser card.
16. Reinstall the accelerator add-in card to the accelerator riser assembly. Follow [steps 12 through 18](#) of [Section 7.11](#).
17. Reinstall the accelerator riser assembly to the Accelerator Module. Follow [steps 19 through 21](#) of [Section 7.11](#).

7.13 Accelerator Module Power Connector Board Replacement (iPC D50TNP2MFALAC Only)

The following description provides power connector board replacement instructions for the accelerator riser assembly on the Accelerator Module (D50TNP2MFALAC).

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1 and #2



TNP30620

Figure 242. Disconnecting the Riser Card Power Cables

1. Disconnect all riser card power cables from the connectors on the accelerator power board.

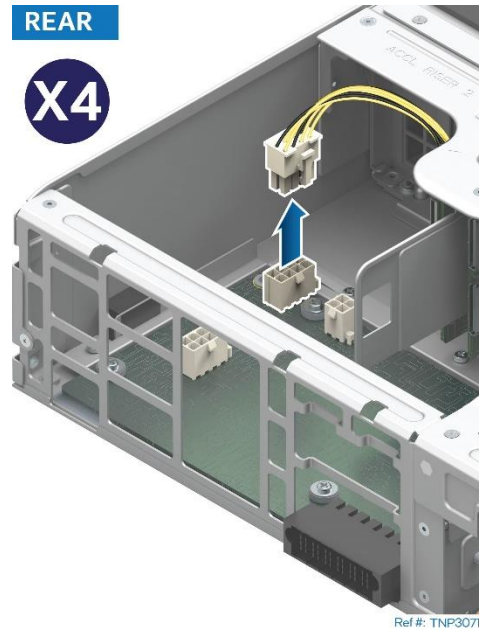


Figure 243. Disconnecting Add-in Card Power Cable

2. Disconnect all accelerator add-in card power cables from the connectors on the power board.

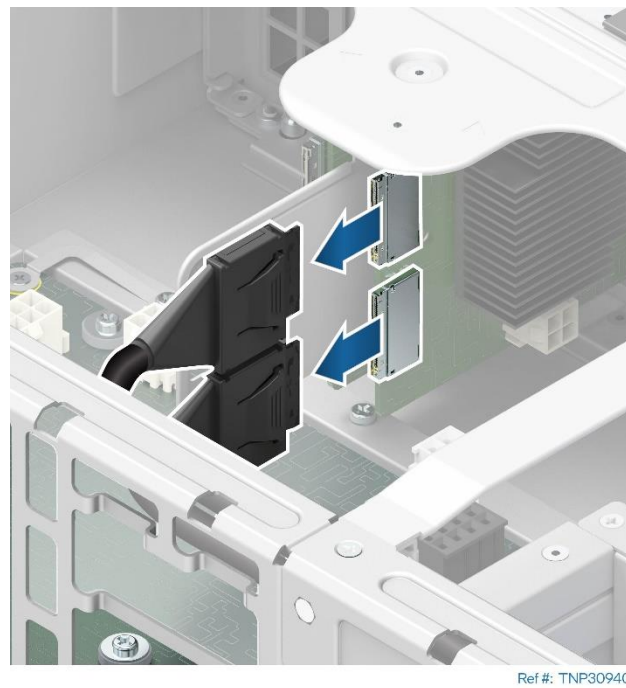


Figure 244. Disconnecting the Riser Card Power OCUlink Cables

3. Disconnect all riser card power OCUlink cables from the connectors on the accelerator riser cards.

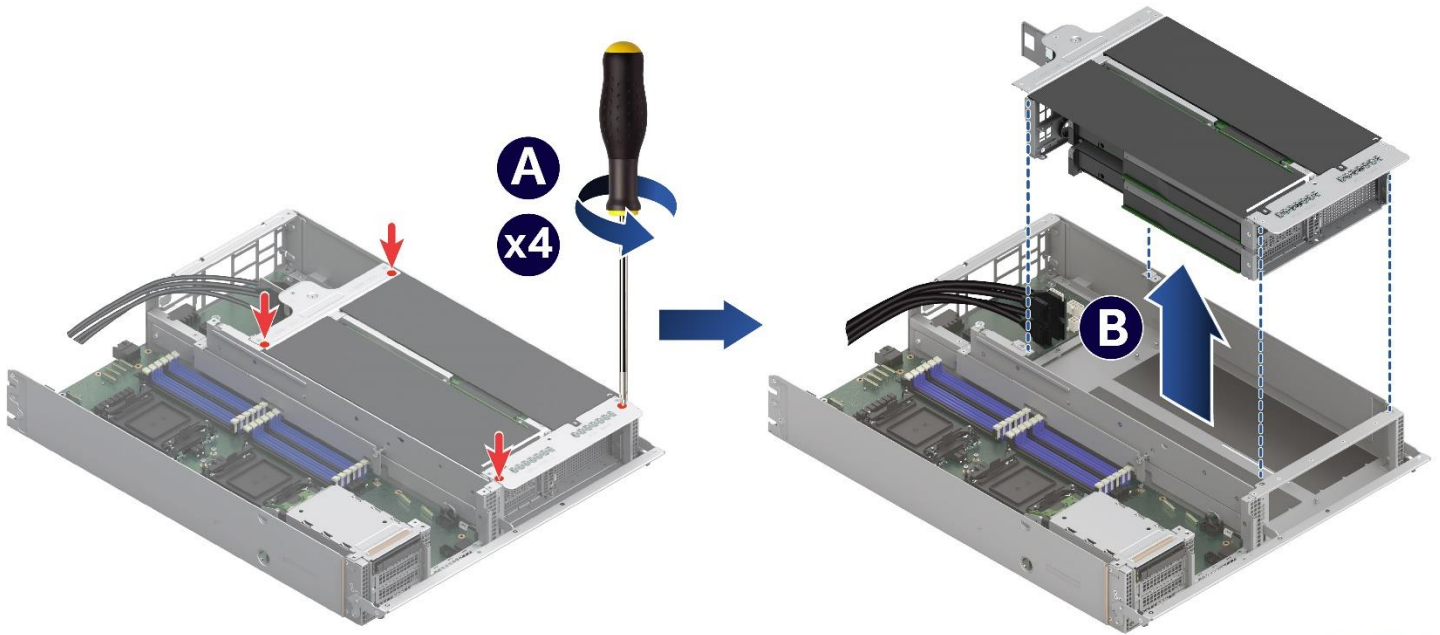


Figure 245. Removing the Accelerator Module Riser Assembly

4. Loosen the four captive screws on the Accelerator Module assembly using Phillips head screwdriver #1 (see Letter A).
5. Carefully remove the Accelerator Module riser assembly by lifting it up away from the module (see Letter B).

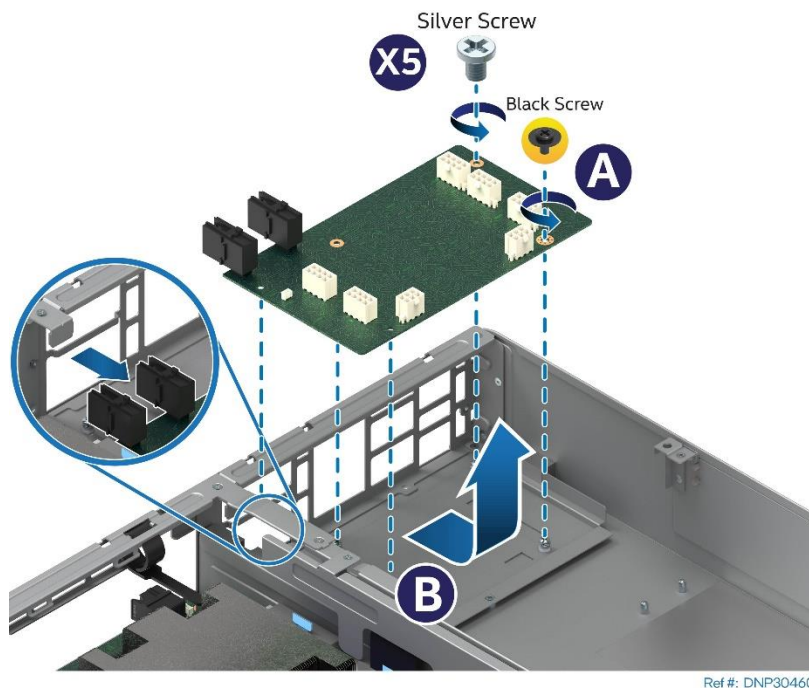


Figure 246. Accelerator Module Power Connector Board Removal

6. Remove the black screw and the silver screws that secure the power connector board to the Accelerator Module using Phillips head screwdriver #2 (see Letter A).
7. Carefully remove the power connector board by lifting it up and away from the module (see Letter B).
8. Locate and unpack the new power connector board for replacement.

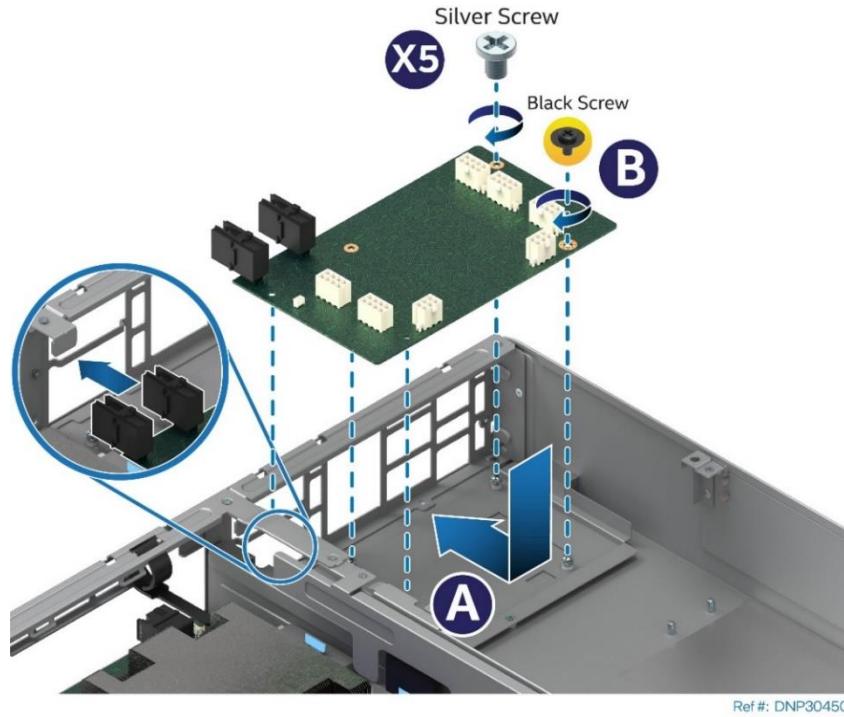


Figure 247. Accelerator Module Power Connector Board Installation

9. Lower the power connector board into the slot in the module and slide it until all the screw holes are aligned (see Letter A).
10. Secure the power connector board to the module with the black screw and the silver screws using Phillips head screwdriver #2.

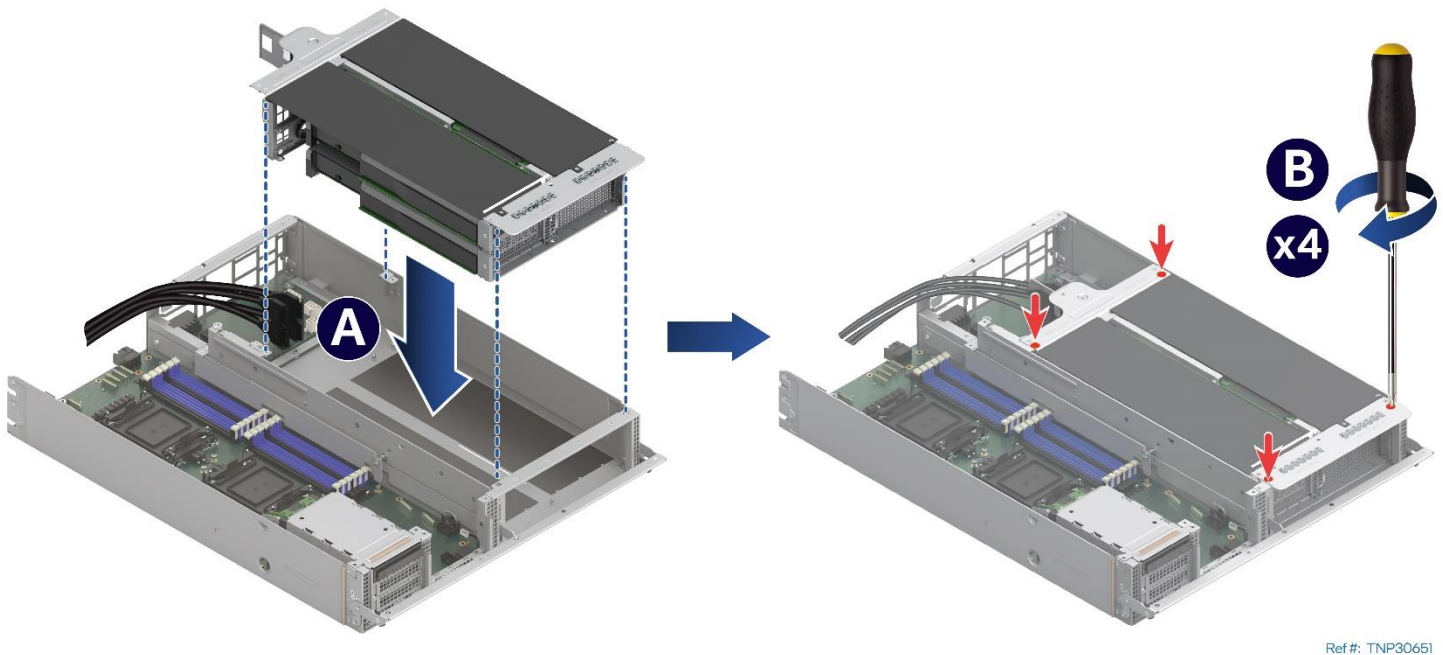


Figure 248. Installing the Accelerator Module Riser Assembly

11. Install the Accelerator Module riser assembly by first aligning the captive screws to the mounting holes on the module. Then, carefully lower the riser assembly to module (see Letter A).
12. Fasten the captive screws to secure the Accelerator Module riser assembly to the module using Phillips head screwdriver #1 (see Letter B).

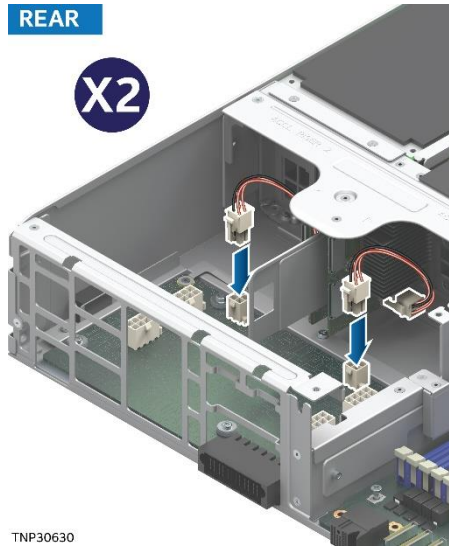


Figure 249. Connecting the Riser Card Power Cables

13. Connect the riser card power cables to the connectors on the power board.

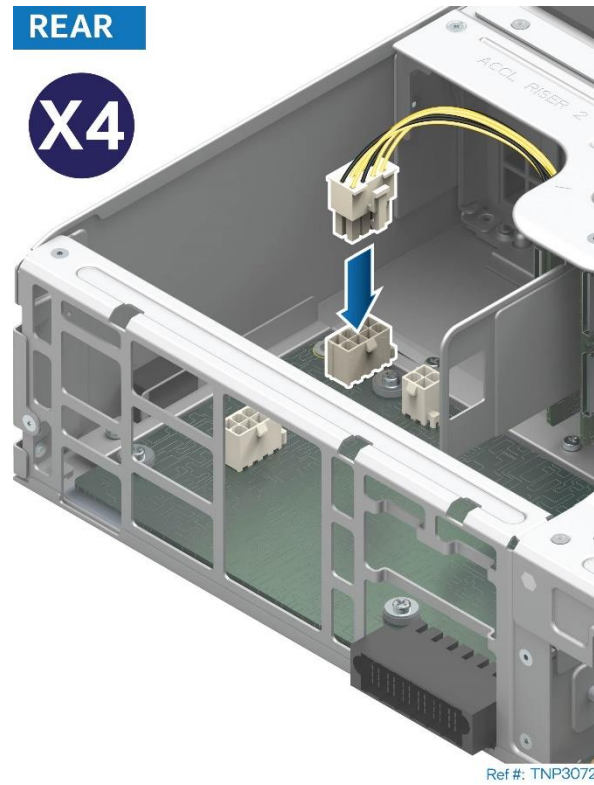


Figure 250. Connecting Add-in Card Power Cable

14. Connect all accelerator add-in card power cables to the connectors on the power board.

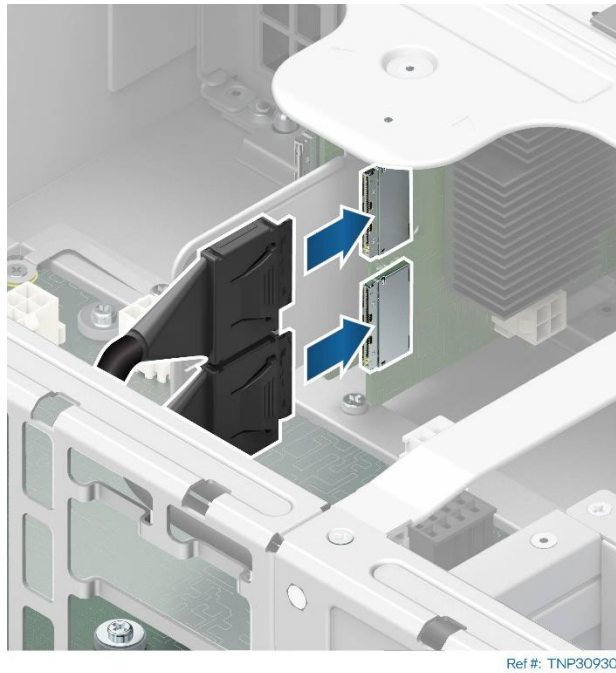


Figure 251. Connecting the OCUlink Power Cables

15. Connect all the OCUlink power cables to the connectors on the accelerator riser cards.

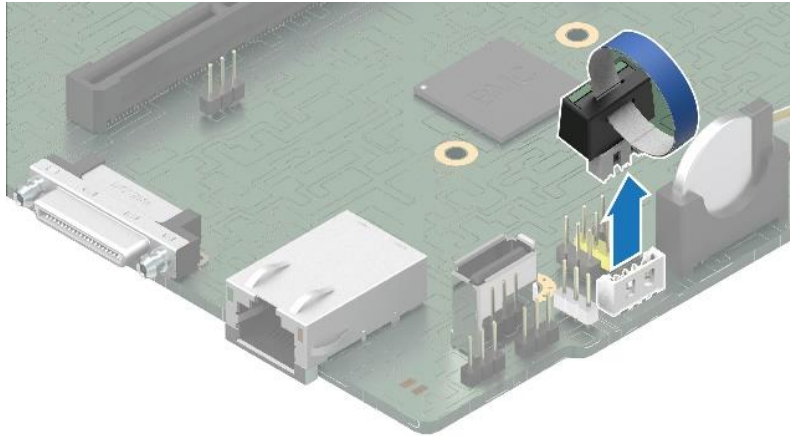
Note: Each OCUlink cable has the number printed on it. Connect each OCUlink cable to the OCUlink connector on the accelerator riser cards that has the same number.

7.14 Intel® Virtual RAID on CPU (Intel® VROC) Upgrade Key Replacement

This section provides instructions to replace an Intel® VROC Key in the system. Refer to the *Intel® Server D50TNP Family Configuration Guide* for available options.

Required Tools and Supplies

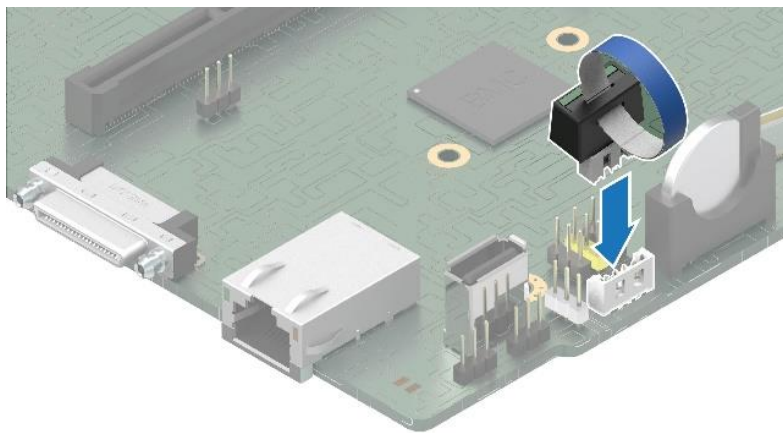
- Anti-static wrist strap and ESD safe workbench (recommended)
1. Remove the module from the chassis (see [Section 7.1.1](#)).
 2. For air-cooled modules, remove the air duct (see [Section 7.2.1](#)).
 3. Remove riser card assemblies (see [Section 7.8](#)).



Ref #: 1NP402243

Figure 252. Removing the Intel® VROC Upgrade Key

4. Locate the Intel® VROC upgrade key near the right edge of the server board.
5. Using the key pull tab, carefully pull up on the key until it disengages from the connector.



Ref #: 1NP402251

Figure 253. Installing the Intel® VROC Upgrade Key

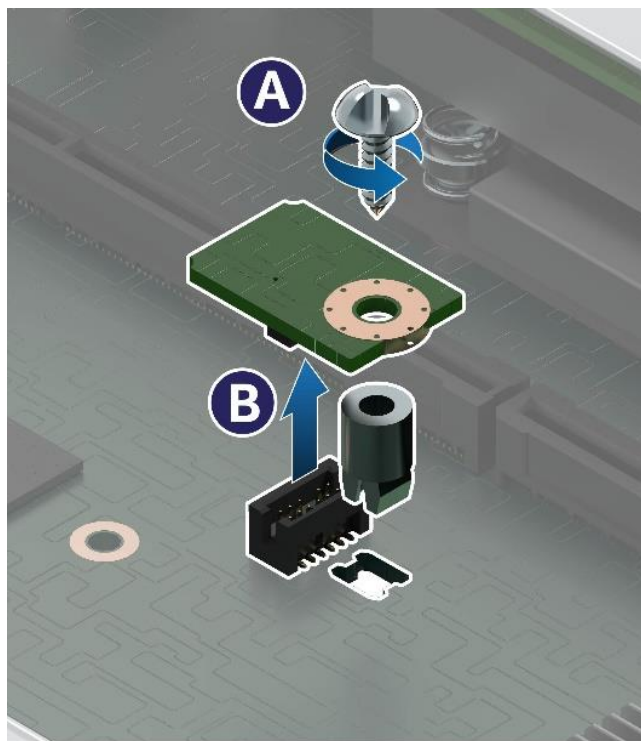
6. Remove the Intel® VROC upgrade key from its packaging.
7. Place the key over the connector and confirm that the orientation of the key matches that of the connector.
8. Press the key down onto the connector until it locks into place.

7.15 Trusted Platform Module (TPM) Replacement

Required Tools and Supplies

- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #1

1. Remove the module from the chassis (see [Section 7.1.1](#)).
2. For air-cooled modules, remove the air duct (see [Section 7.2.1](#)).
3. Remove riser card assemblies (see [Section 7.8](#)).



Ref #: TNP41620

Figure 254. Removing the Trusted Platform Module (TPM)

4. Locate the TPM module connector on the server board.
5. Remove the fastener screw on the TPM module (see Letter A).
6. Gently remove and lift the TPM module away from the connector (see Letter B).
7. (If needed) remove the plastic stand-off from the server board mounting hole.

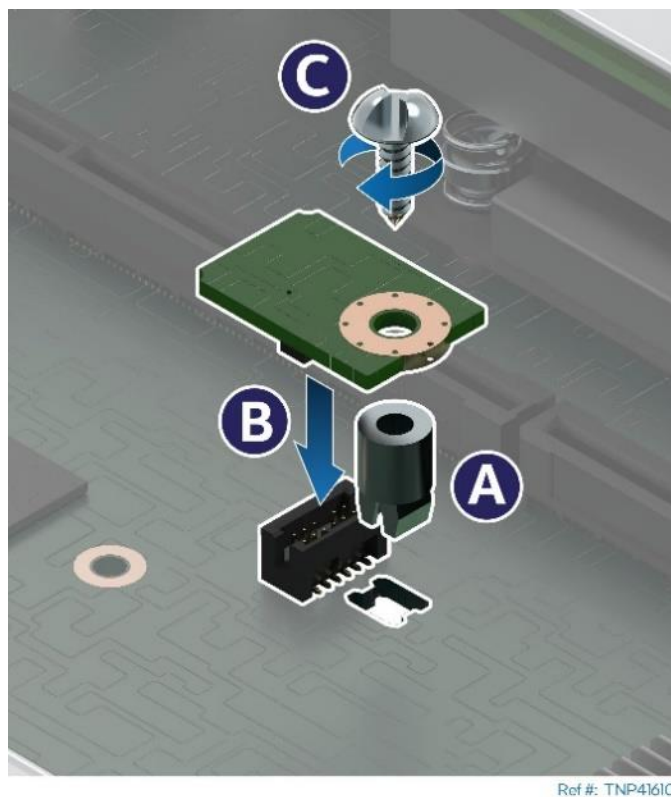


Figure 255. Installing the Trusted Platform Module (TPM)

8. Remove the new TPM module from its packaging.
9. (If not already installed) insert the plastic stand-off into the server board mounting hole (see Letter A).
10. Place the TPM module over the connector and confirm the orientation of the module.
11. Press the module down onto the connector (see Letter B).
12. Secure the TPM module to the stand-off with the fastener screw (see Letter C).

7.16 Power Supply Replacement

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

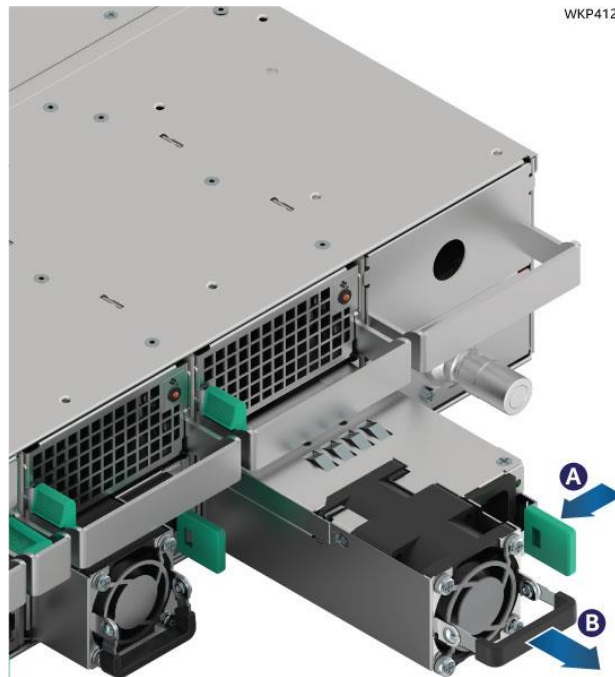


Figure 256. Removing the Power Supply

1. Identify the faulty power supply.
2. Detach the power cord from the power supply to be removed.
3. Push and hold the green latch in the direction shown (see Letter A).
4. Use the handle to pull the power supply module from the system fan assembly (see Letter B).

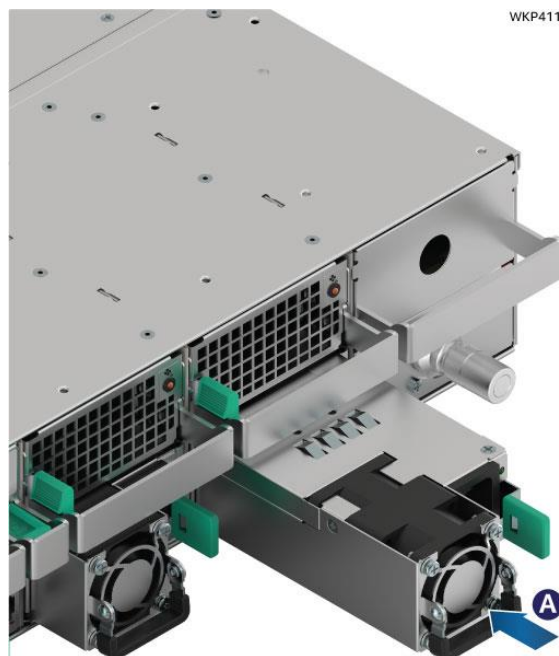


Figure 257. Installing the Power Supply

5. Insert the power supply module into the system fan assembly (see Letter A).
6. Push the power supply module into the system fan assembly until it locks into place.

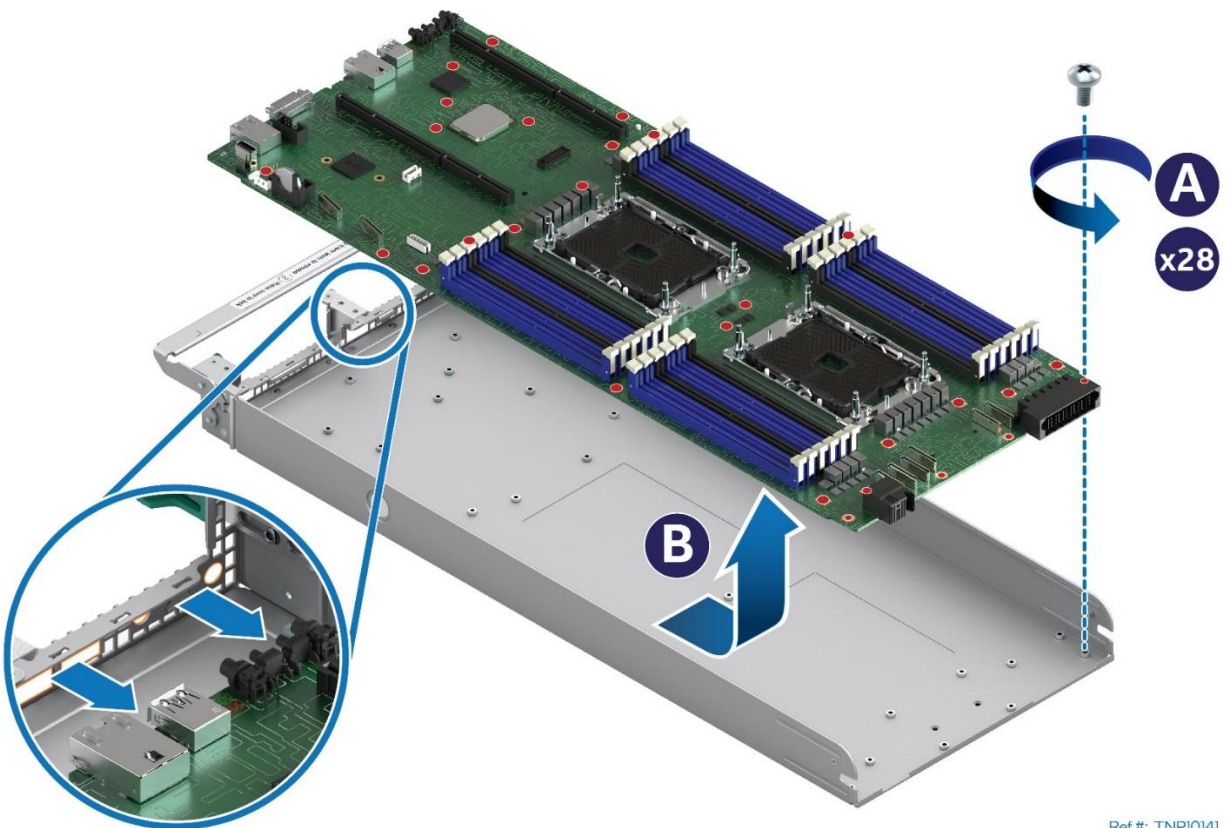
7.17 Server Board Replacement

Before performing this procedure, review all the safety and ESD precautions found in the Safety Warnings section at the beginning of this document.

Note: All components removed from the module must be kept on an ESD safe work surface or into an ESD safe bin or bag while full module/system disassembly and reassembly is in progress.

Required Tools and Supplies

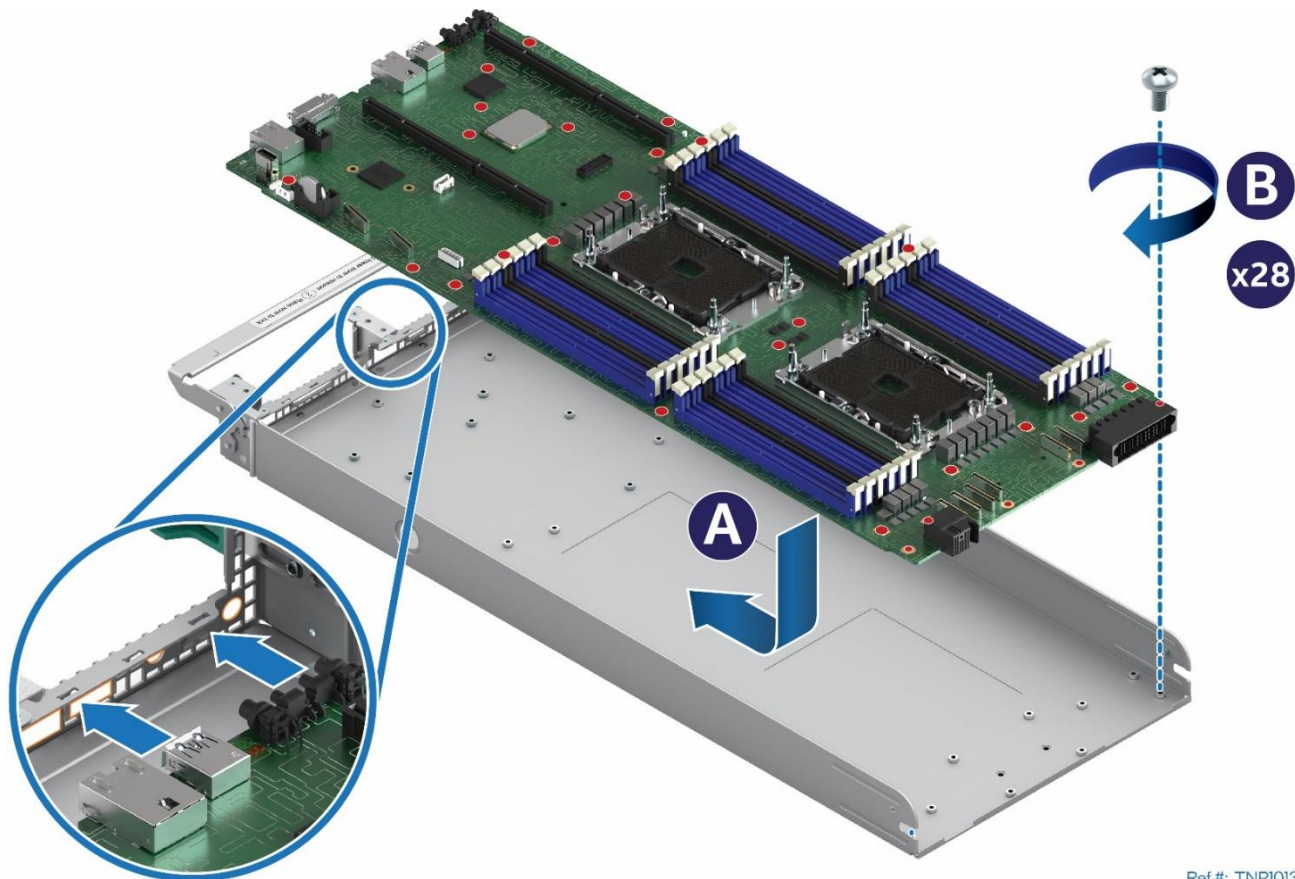
- Anti-static wrist strap and conductive workbench pad (recommended)
- Phillips* head screwdriver #2



Ref #: TNPI0141

Figure 258. Server Board Removal

1. Remove the module from the chassis (see [Section 7.1.1](#)).
2. For air-cooled modules, remove the air duct (see [Section 7.2.1](#)).
3. Remove riser card assemblies (see [Section 7.8](#)).
4. Remove all options installed onto the server board including (if installed) the Intel® VROC 7.5 key (see [Section 3.11](#)).
5. Remove all DIMMs (see [Section 7.5](#)).
6. For liquid-cooled module, remove the liquid-cooling loop (see [Section 7.9](#)).
7. Remove processors (see [Section 7.4](#)).
8. Remove 28 screws used to secure the server board to the module tray (see Letter A). Screw locations on the server board are shown with red circles in the above figure.
9. Slide the server board slightly towards the back of the module tray. Then, carefully lift the server board from the module tray (see Letter B) and place it in an anti-static bag.



Ref #: TNPI0131

Figure 259. Server Board Installation

10. Remove the new server board from its anti-static bag.
11. Carefully lower the server board into the module tray.
12. Slide the server board slightly toward the front of the module tray until the connectors go through the cut-out on the front panel and the screw holes in the server board align with the standoffs in the module tray (see Letter A).
13. Fasten the server board to the module tray using all the screws (see Letter B). Tighten to 5 in-lb.
14. Reinstall processors (see [Section 7.4](#)).
15. For liquid-cooled module, reinstall the liquid-cooling loop (see [Section 7.9](#)).
16. Reinstall DIMMs (see [Section 7.5](#)).
17. Reinstall riser card assemblies (see [Section 7.8](#)).
18. Reinstall all options previously removed from the server board, including the Intel® VROC 7.5 key (see [Section 3.11](#)).
19. For air-cooled modules, reinstall the air duct (see [Section 7.2.2](#)).
20. Reinstall the module in the chassis (see [Section 7.1.2](#)).

7.18 System Fan Replacement

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

The Intel® Server System D50TNP supports two system fan configurations as shown in the following figures – one for liquid-cooled configurations and one for air-cooled configurations.

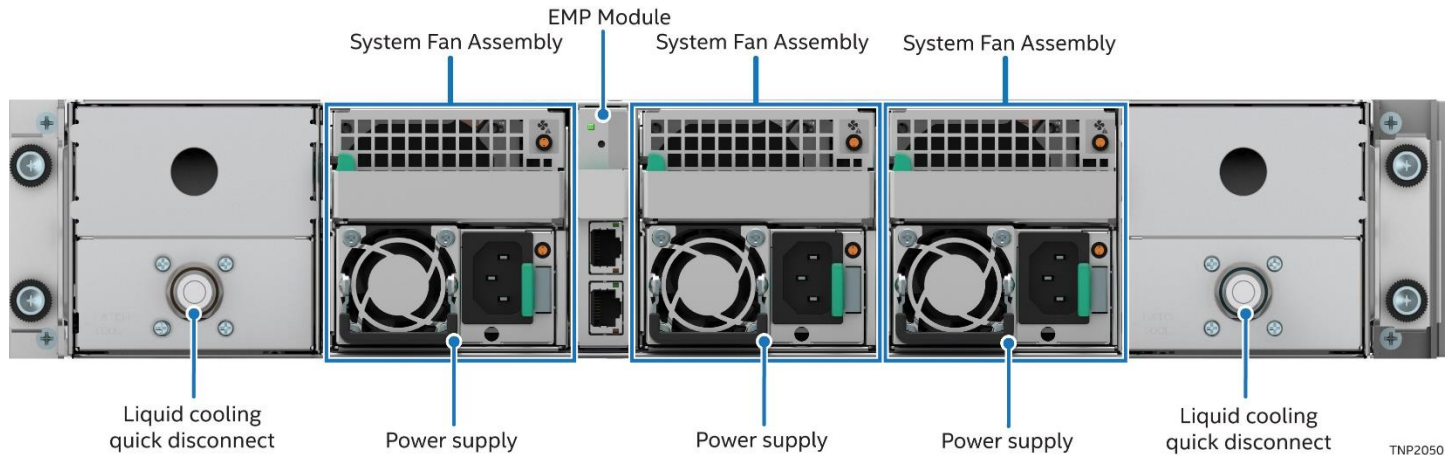


Figure 260. System Fan Configuration – Liquid-Cooled System

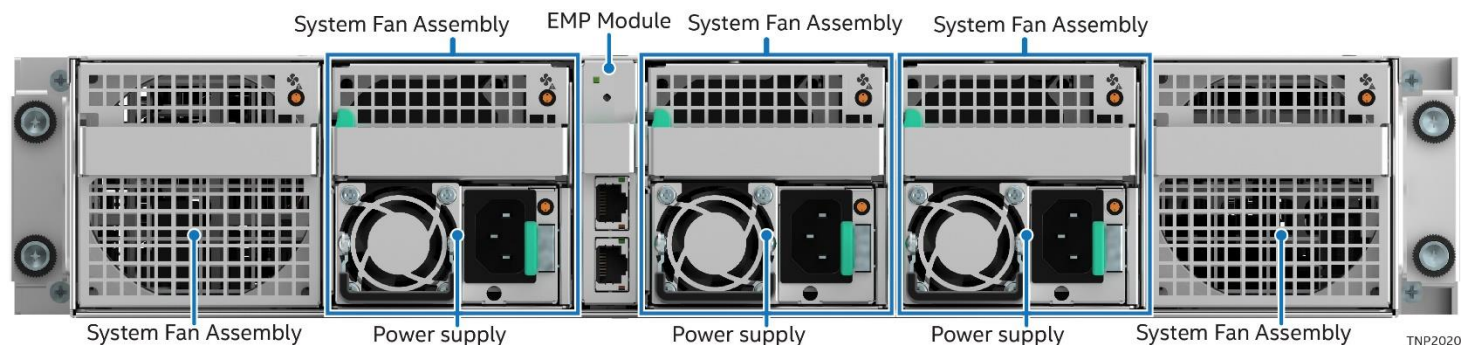
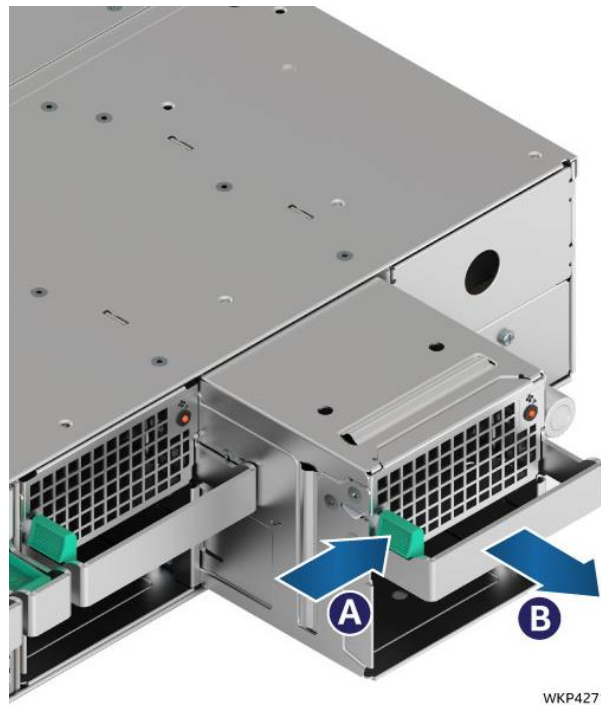


Figure 261. System Fan Configuration – Air-Cooled System

The system is designed to support fan redundancy. Should a single fan rotor fail, system management will engage various system thermal controls to maintain system thermals below maximum limits. Depending on the system configuration, the system fans are designed to be hot swappable.

In air-cooled configurations, the two outer 80 mm system fans are hot swappable.

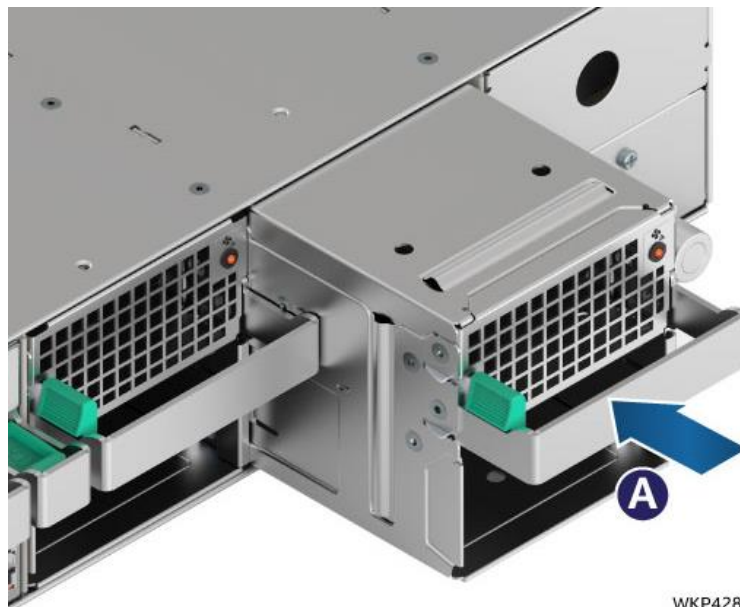
In liquid-cooled and air-cooled system configurations, three 60 mm system fans share the same assembly housing as a power supply module. The power supply module must be removed from the fan assembly before removing the assembly housing from the chassis. Using hot swap for these system fans can only be supported when the system is configured to support 2 + 1 power supply redundancy. Attempting to hot swap one of these fans with power redundancy lost will cause the entire system to shut down, unless the failed fan is in the same assembly as a failed power supply.



WKP4271

Figure 262. Removing the System Fan

1. If present, remove the power supply (see [Section 7.16](#)) from the system fan assembly to be removed.
2. While pushing the green latch in the shown direction (see Letter A), use the handle to pull the system fan assembly out of the bay (see Letter B).



WKP4281

Figure 263. Installing the System Fan

3. Ensure that no power supply is preinstalled in the system fan assembly.
4. Insert the system fan assembly into the open fan assembly bay (see Letter A).

Note: 80 mm fans must be installed on the sides (air-cooled system only); 60 mm fans must be installed in the three center bays.

5. Push in the system fan assembly until it locks into place.

7.19 Chassis Plumbing Assembly Replacement (Liquid-Cooled Systems Only)

Select system configurations support liquid-cooling on the installed modules through a passive liquid-cooling loop.

The coolant flow for the liquid-cooling loop is supported through liquid-cooling plumbing connections installed in the back of the server chassis. If the chassis plumbing or plumbing connections become damaged or worn out, the following information provides the instructions necessary to remove and replace the chassis plumbing assembly.

Required Tools and Supplies:

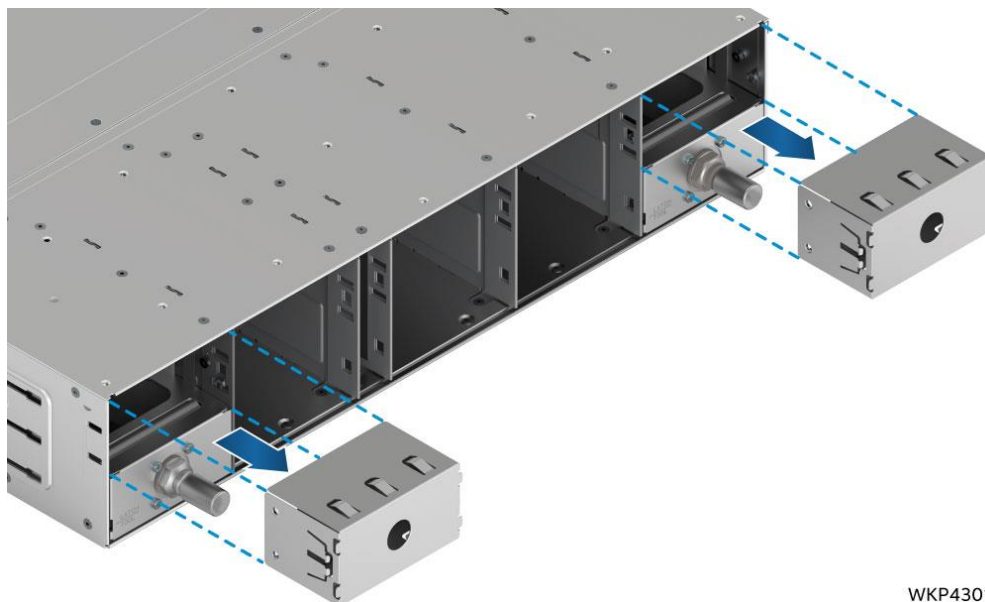
- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #2

1. Power down all nodes in the server chassis.
2. Remove the server chassis from the rack and place it on a flat surface.

Important Safety Note: Due to the weight of a fully configured system, Intel® recommends:

- use a mechanical lift to aid with the removal of the server chassis from the rack, and/or
 - use at least two people to remove the server chassis from the rack, or
 - remove all installed modules from the system before attempting to remove the system from the rack
-

3. Make sure that all modules are removed from the server chassis (see [Section 7.1.1](#)).
4. Remove the power supplies (see [Section 7.16](#)).
5. Remove the system fans (see [Section 7.18](#)).
6. Remove the EMP module / EMP module blank (see [Section 3.13](#)).



WKP4301

Figure 264. Removing the Quick Connect Fillers

7. Remove the fillers located above the quick connect couplings in the back of the chassis.



Figure 265. Removing the Quick Connect Screws

8. Using a Phillips head screwdriver, remove the four screws that secure each of the quick connect couplings to the covers.



Figure 266. Removing Quick Connect Covers

9. Pull the quick connect covers upwards, then out.

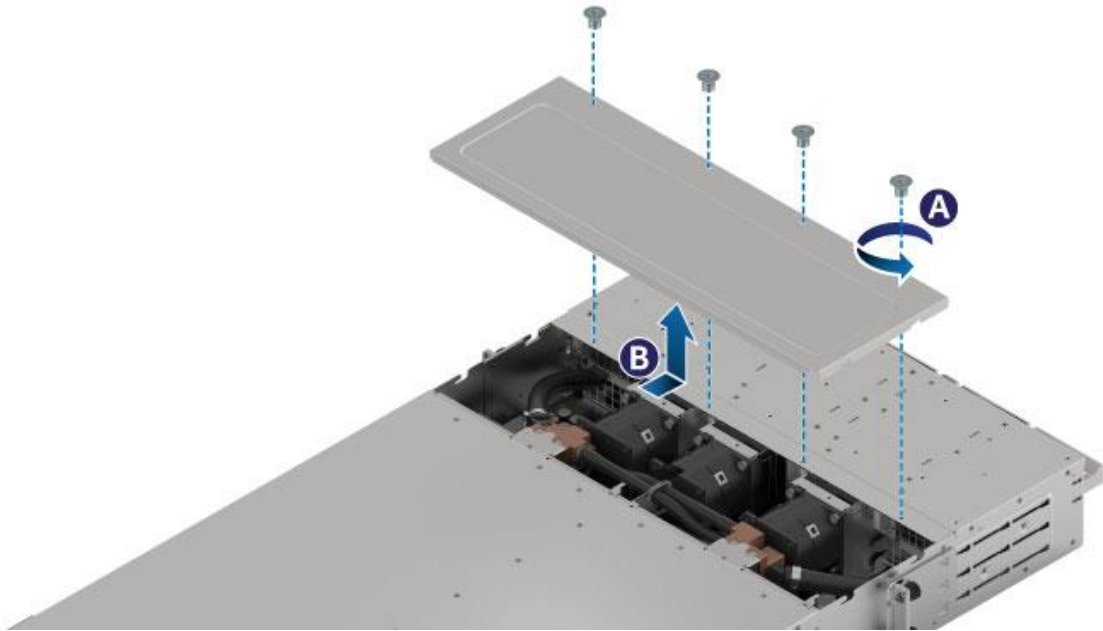
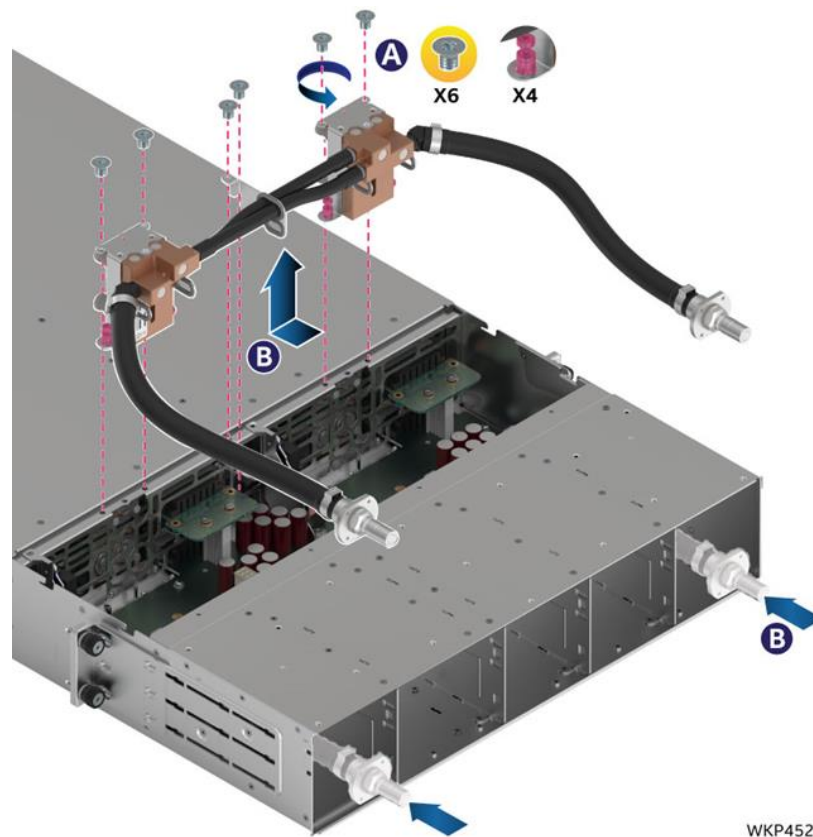


Figure 267. Removing the Back Cover

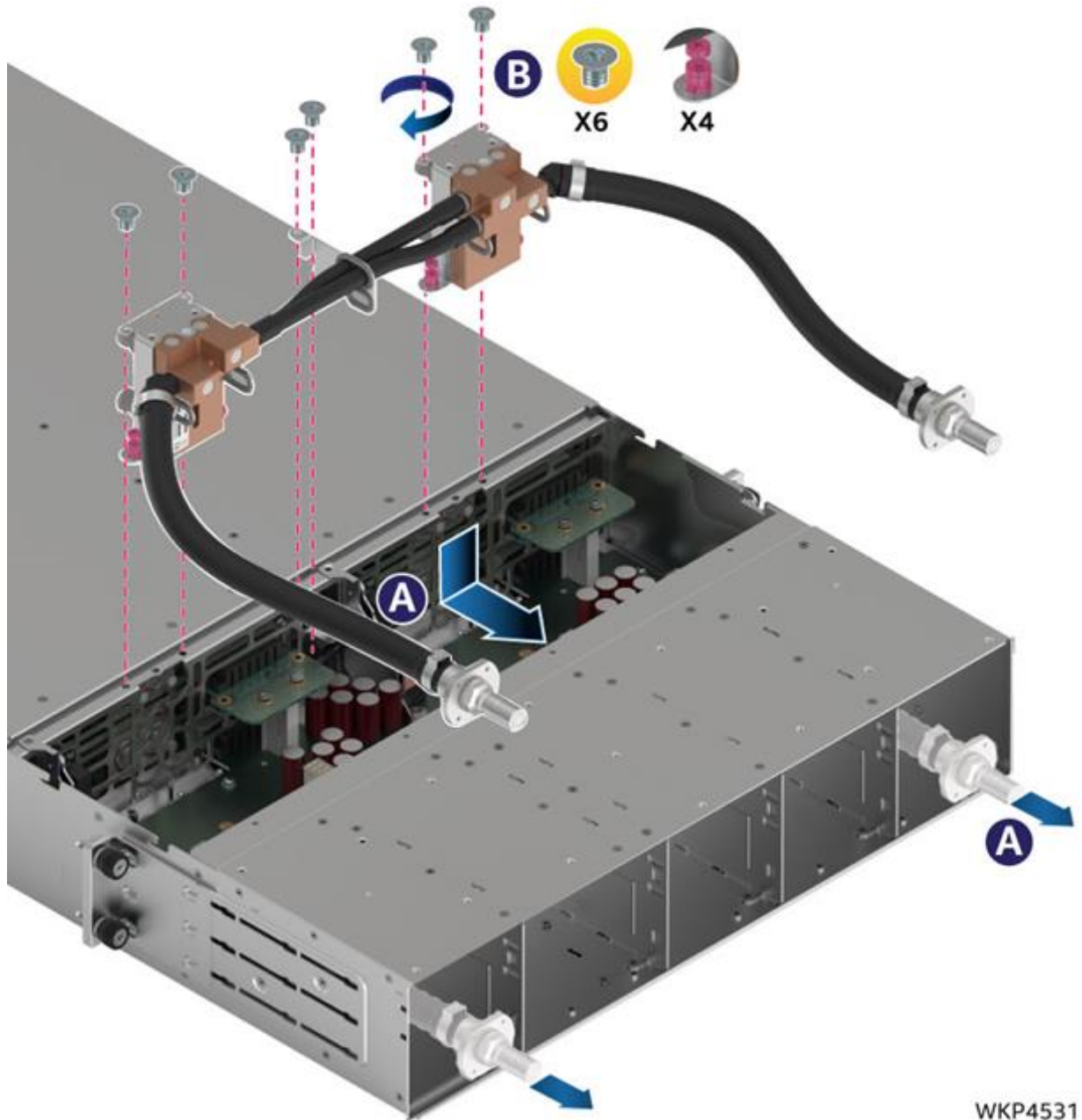
10. Locate the chassis back cover and remove the four screws with a Phillips head screwdriver (see Letter A).
11. Slide the cover towards the back and lift it up (see Letter B).



WKP4521

Figure 268. Removing the Chassis Plumbing Assembly

12. Using a Phillips head screwdriver, remove the six screws on the top brace of the plumbing assembly and loosen the four captive screws on the sides of the brace (see Letter A).
13. Carefully pull towards the front of the chassis and then up to remove the plumbing assembly (see Letter B).



WKP4531

Figure 269. Installing the Chassis Plumbing Assembly

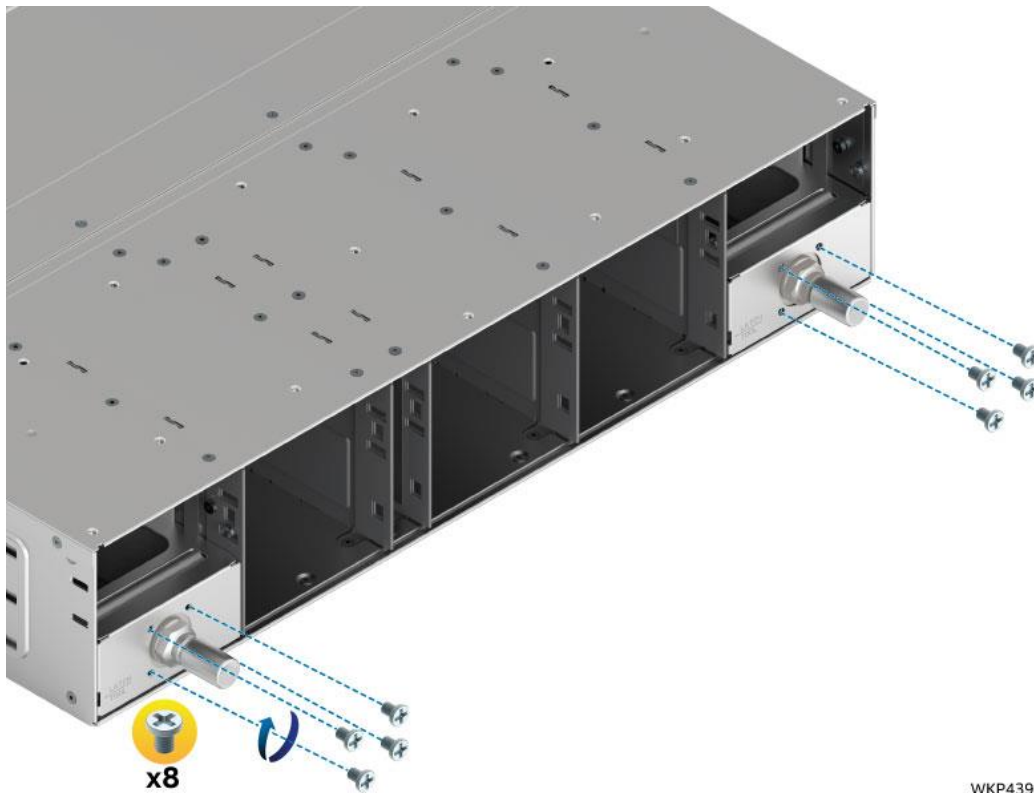
14. Lower the plumbing assembly inside the chassis and slide the quick connect couplings into their respective bays (see Letter A).
15. Align and secure the plumbing assembly to the chassis. Use a Phillips head screwdriver and the six screws provided on the top brace and tighten the four captive screws on the sides of the brace (see Letter B).



WKP4570

Figure 270. Installing Quick Connect Covers

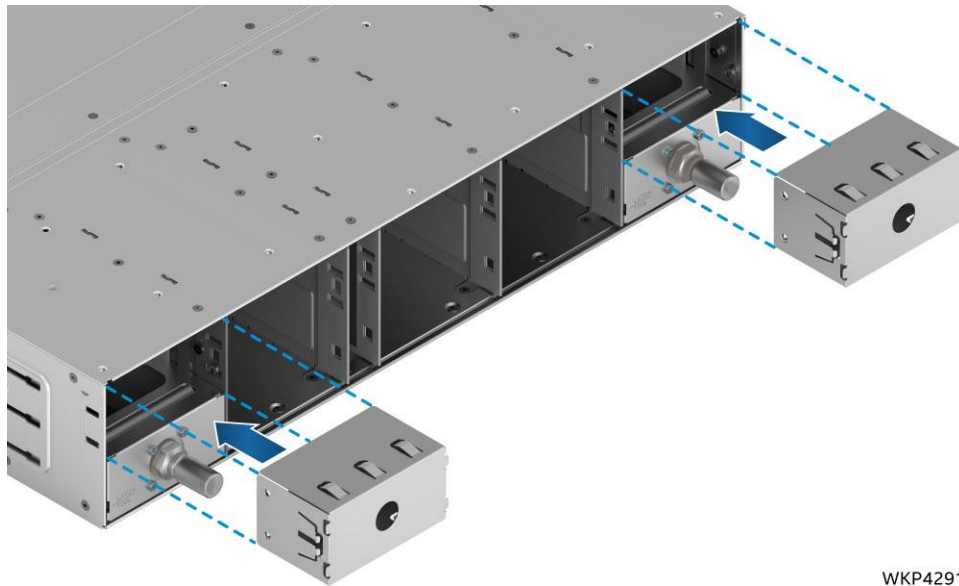
16. Install the quick connect covers by sliding them into the chassis and then pressing down.



WKP4390

Figure 271. Securing the Quick Connect Couplings to the Covers

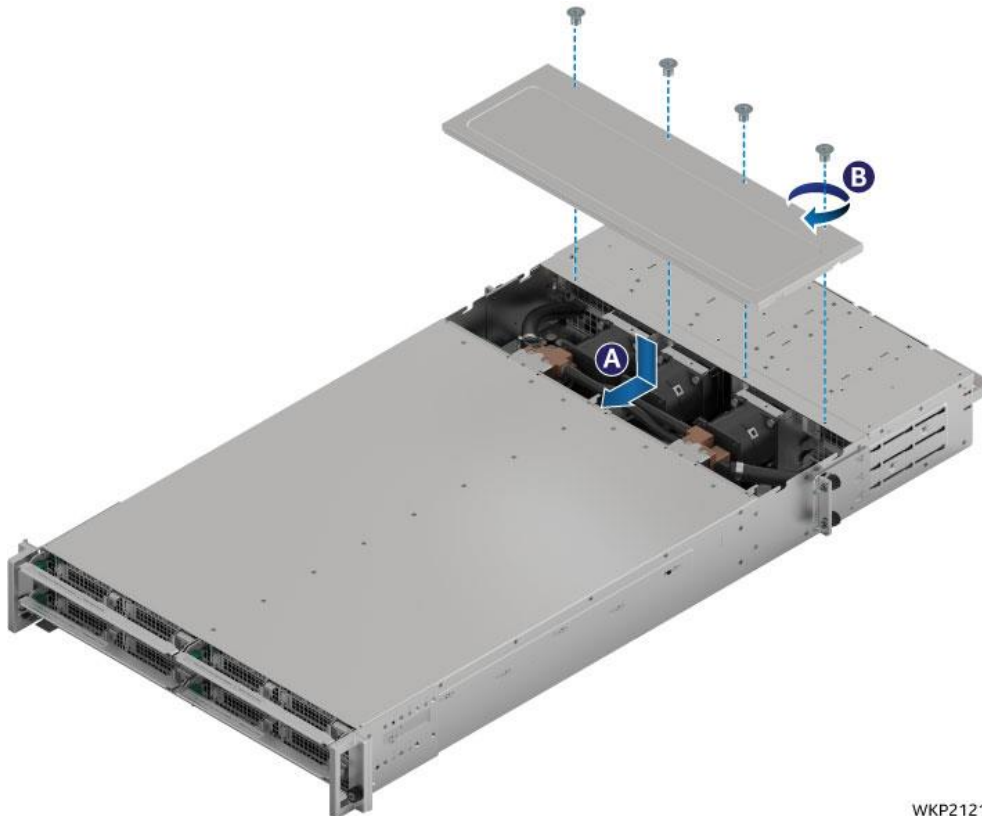
17. Align and secure the quick connect couplings to the covers using a Phillips head screwdriver and the four screws provided for each coupling.



WKP4291

Figure 272. Installing the Quick Connect Fillers

18. Insert the fillers above the quick connect couplings in the back of the chassis.
19. Install the system fans (see [Section 7.18](#)).
20. Install the power supplies (see [Section 7.16](#)).



WKP2121

Figure 273. Securing the Back Cover

21. Place the back cover on top of the chassis and slide it towards the front (see Letter A).
22. Secure the back cover with a Phillips head screwdriver and the four screws provided (see Letter B).

7.20 Power Distribution Board (PDB) Assembly Replacement

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)
- Phillips* head screwdriver #1

1. Power the system down and remove it from the rack.

Important Safety Note: Due to the weight of a fully configured system, Intel recommends:

- use a mechanical lift to aid with the removal of the system from the rack, and/or
 - use at least two people to remove the system from the rack, or
 - remove all installed modules from the system before attempting to remove the system from the rack.
-

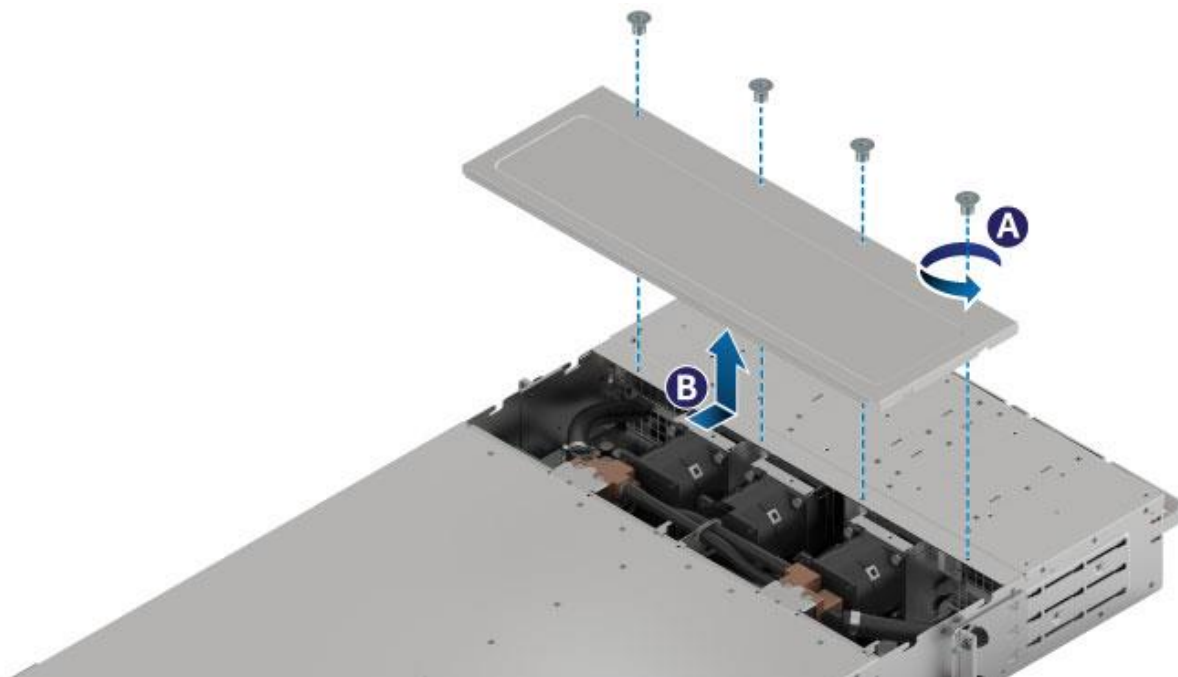
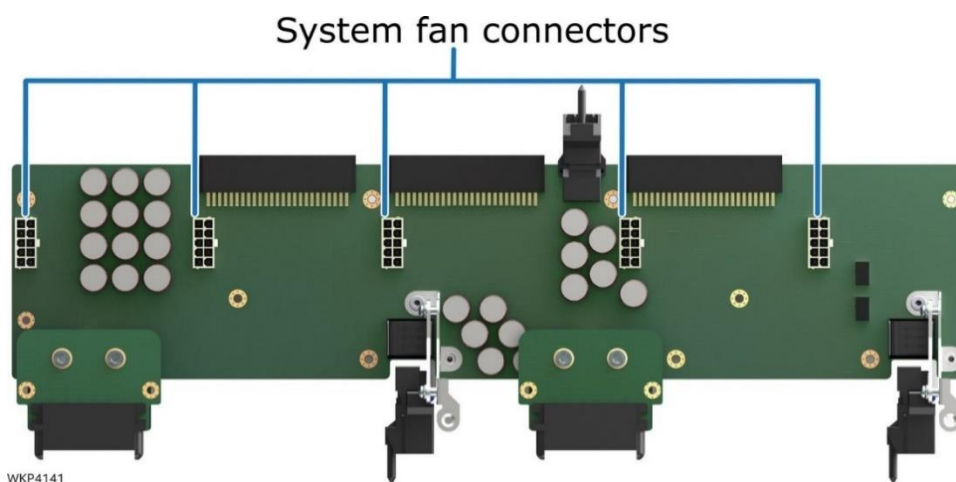


Figure 274. Removing the Back Cover

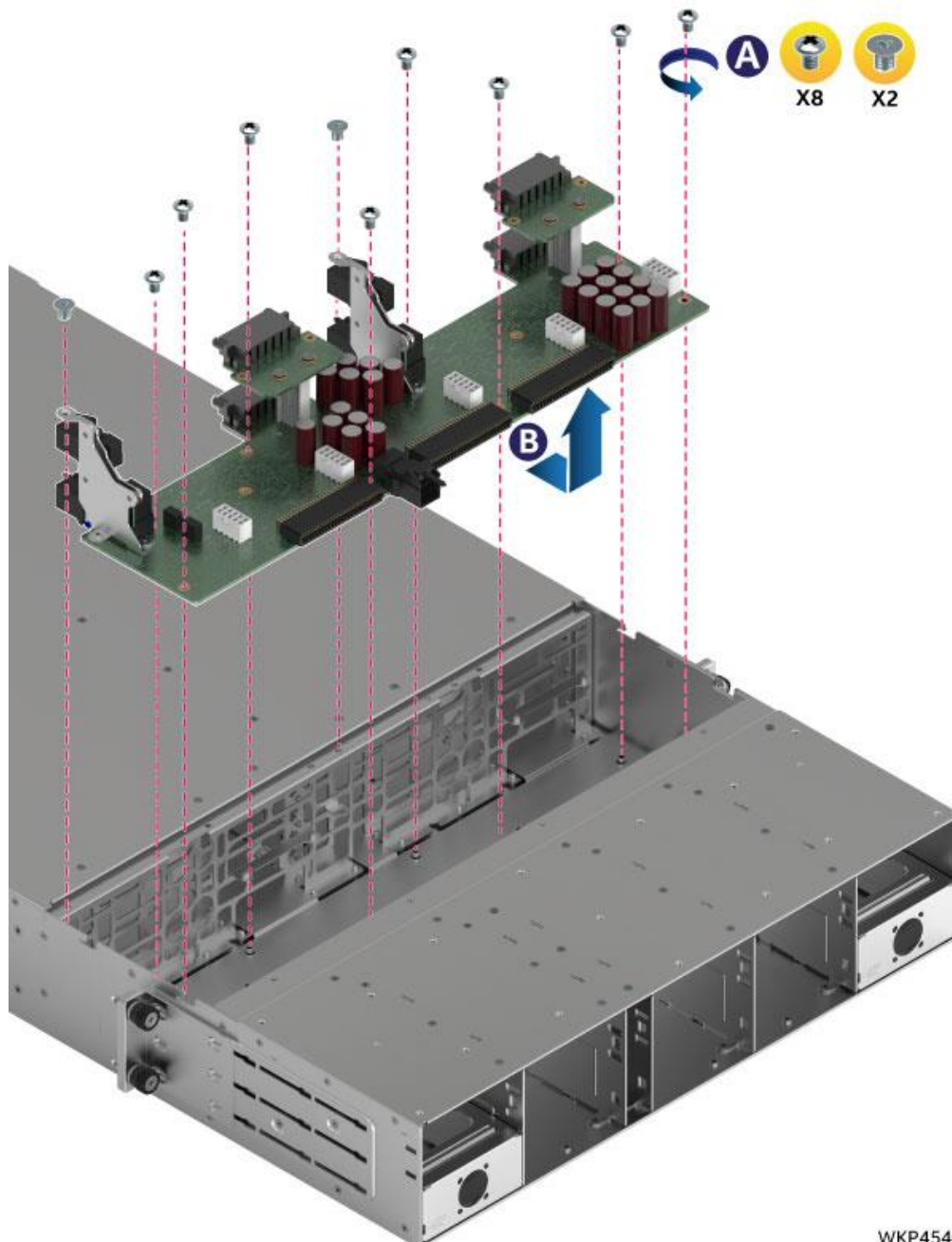
2. Make sure that all modules are removed from the server chassis (see [Section 7.1.1](#)).
3. Locate the chassis back cover and remove the four screws with a Phillips head screwdriver (see Letter A).
4. Slide the cover towards the back and lift it up (see Letter B).



WKP4141

Figure 275. Disconnecting the System Fan Power Cables

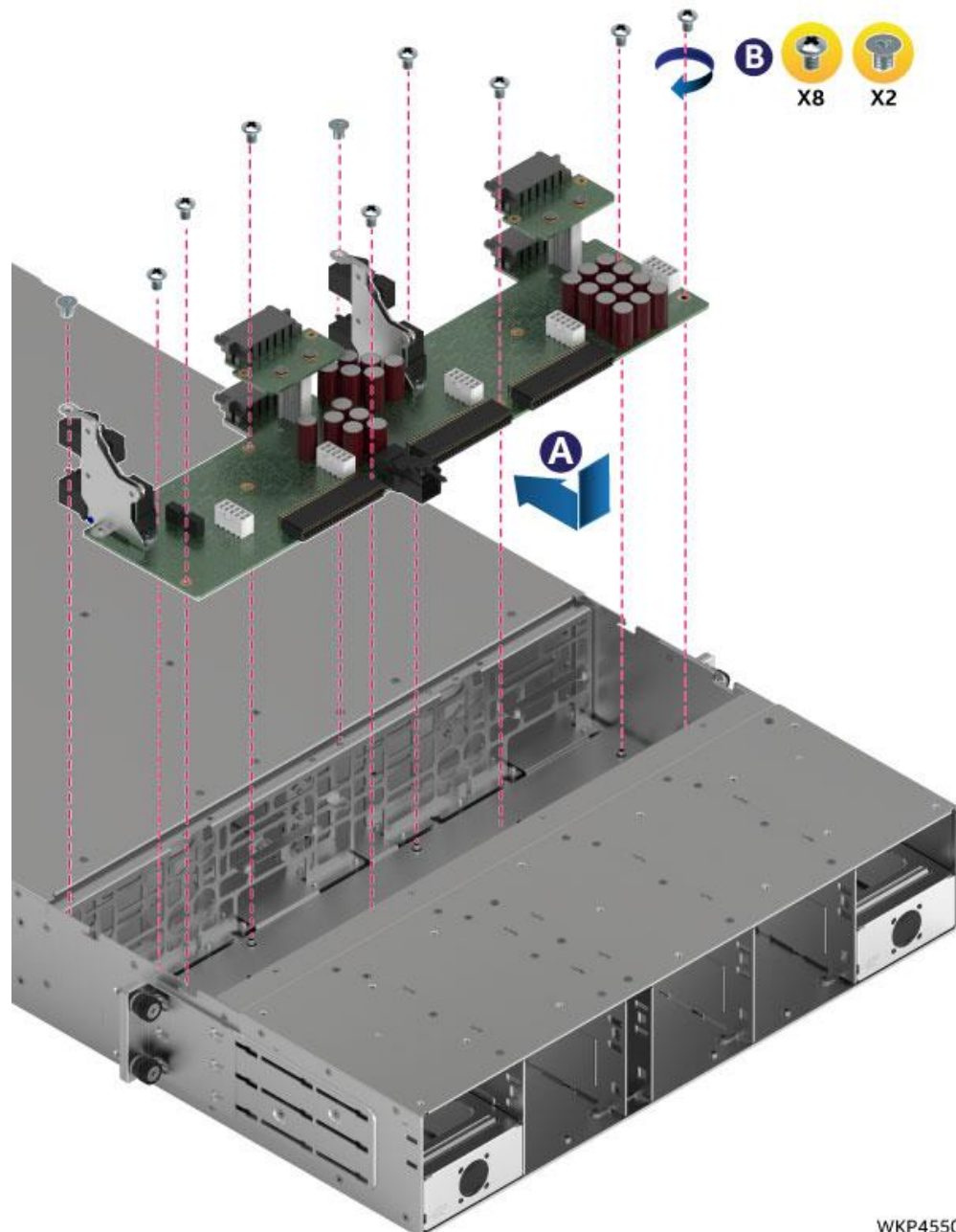
5. Locate and disconnect the system fan power cables from the power distribution board by pressing inwards on each clip and lifting them up.
6. Remove the power supplies (see [Section 7.16](#)).
7. Remove the system fans (see [Section 7.18](#)).
8. Remove the EMP module or EMP module blank if installed (see [Section 3.13](#)).
9. If the system is liquid-cooled, remove the chassis plumbing (see [Section 7.19](#)).



WKP4540

Figure 276. Removing the Power Distribution Board

10. Remove the screws securing the power distribution board to the chassis with a Phillips head screwdriver (see Letter A).
11. Remove the PDB by lifting it upwards, tilting up the front side of the PDB, and then lifting the board out (see Letter B).



WKP4550

Figure 277. Installing the Power Distribution Board

12. Remove the new PDB from its packaging.
13. Lower the PDB into the chassis, tilting down the back side and then sliding the board to the front (see Letter A).
14. Secure the power distribution board using a Phillips head screwdriver and the provided screws (see Letter B).
15. If the system is liquid-cooled, install the chassis plumbing (see [Section 7.19](#)).
16. Install the EMP module if available, or an EMP module blank (see [Section 3.13](#)).
17. Install the system fan assemblies (see [Section 7.18](#)).
18. Install the power supplies (see [Section 7.16](#)).

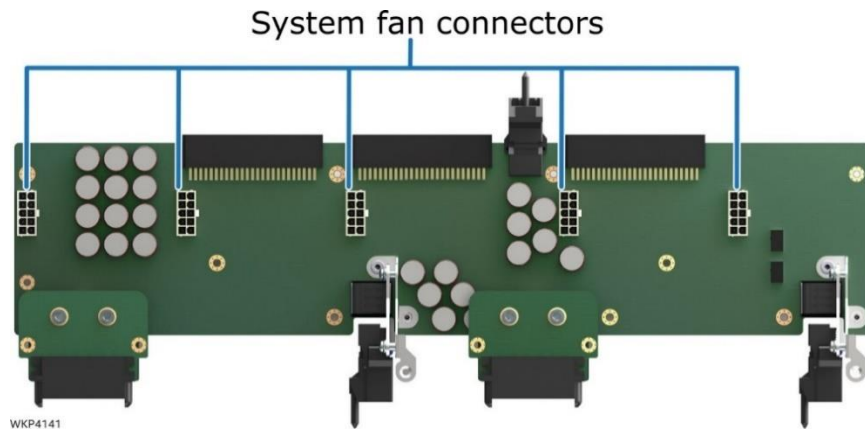


Figure 278. Connecting System Fan Power Cables

19. Locate and connect the system fan cables by pressing inwards on each clip and pressing them down into the appropriate connector.

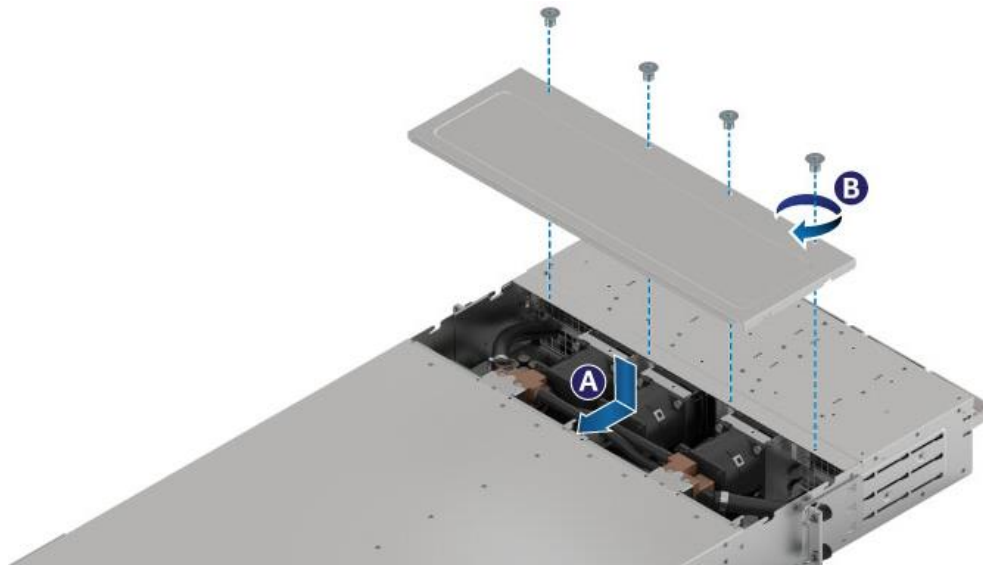


Figure 279. Securing the Back Cover

20. Place the back cover over the top of the chassis and slide it towards the front (see Letter A).

21. Secure the back cover with a Phillips head screwdriver and the four screws provided (see Letter B).

7.21 Internal Chassis Rail Replacement

The systems in the Intel® Server D50TNP Family include internal rails to support 1U modules in the upper part of the inner walls of the chassis. Should the internal rails become damaged or worn out, this section provides the instructions necessary to replace them.

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

Note: To maintain optimal performance of the system, Intel recommends replacing ALL internal rails at once.

1. Power the modules down.
2. Remove the server chassis from the rack and place it on a flat surface.

Important Safety Note: Due to the weight of a fully configured system, Intel recommends:

- use a mechanical lift to aid with the removal of the system from the rack, and/or
 - use at least two people to remove the system from the rack, or
 - remove all installed modules from the system before attempting to remove the system from the rack
-

3. Remove the modules from the bays selected for service (see [Section 7.1.1](#)).
4. Locate the internal rails in the upper part of the inner walls of the chassis.

TNP41390

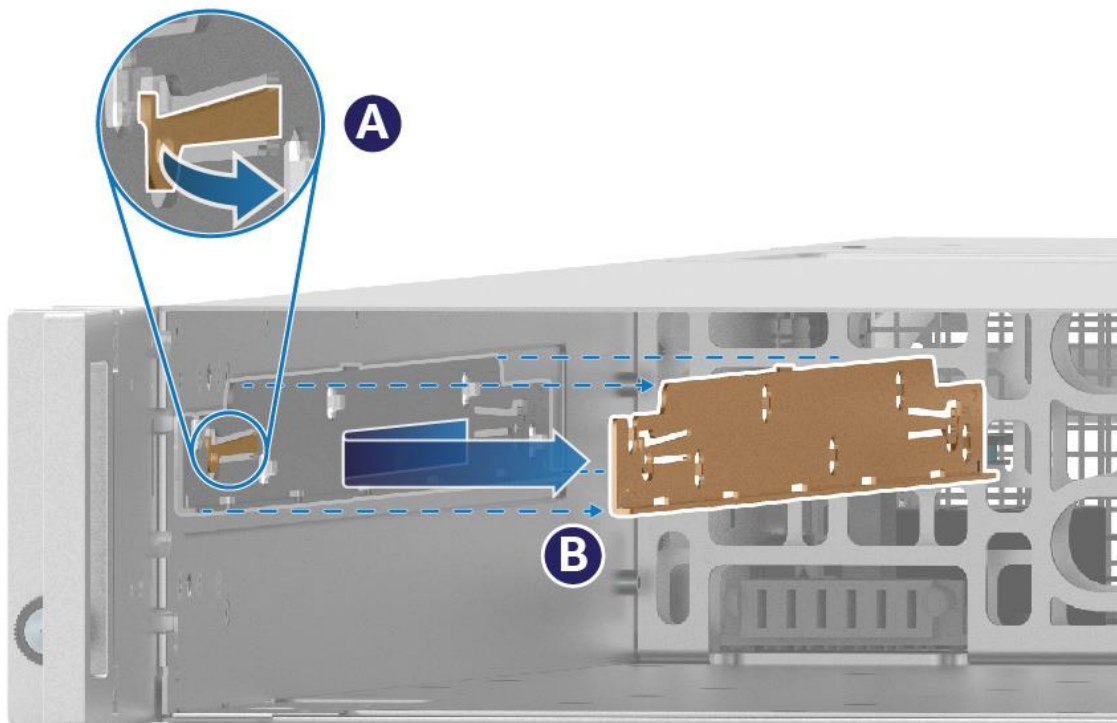


Figure 280. Removing the Internal Chassis Rail

5. Release the rail latch (see Letter A).
6. Slide the rail towards the front of the chassis to remove it (see Letter B).

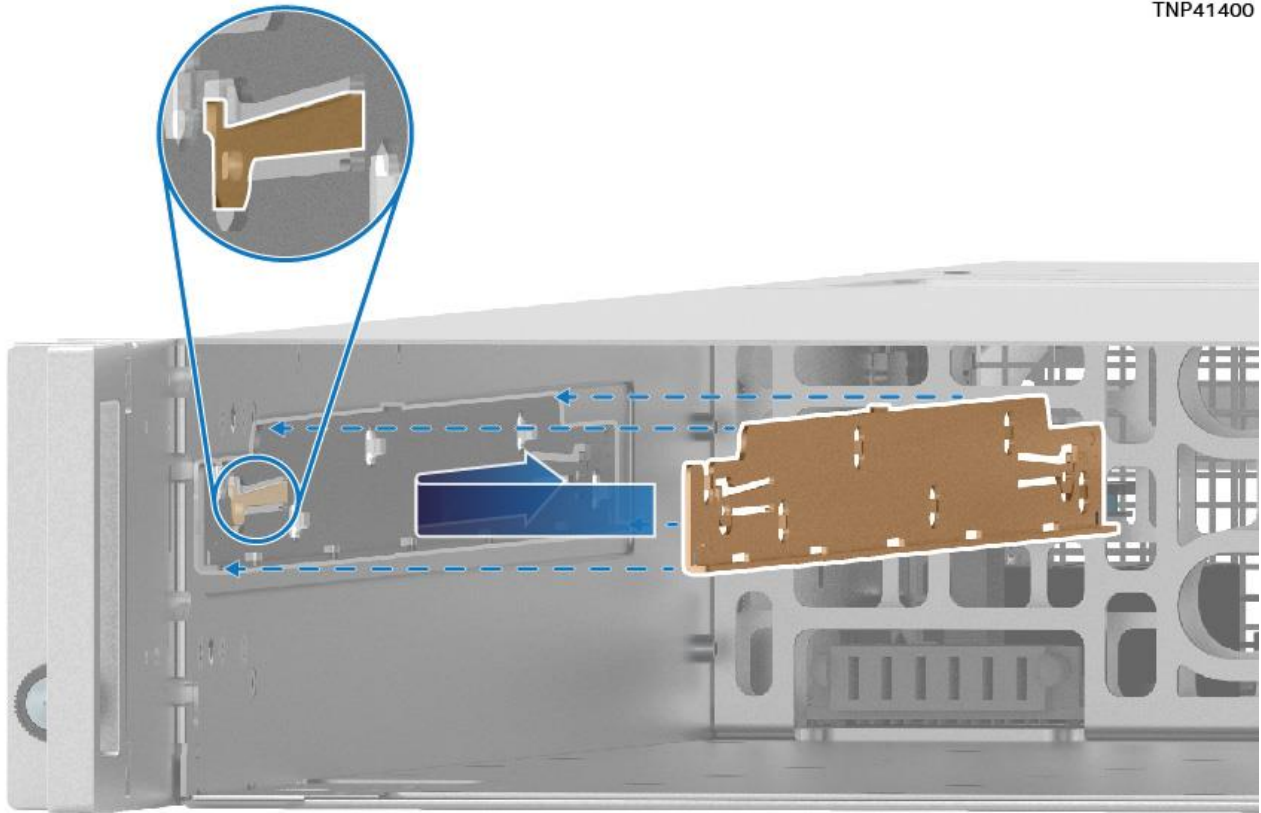


Figure 281. Installing the Internal Chassis Rail

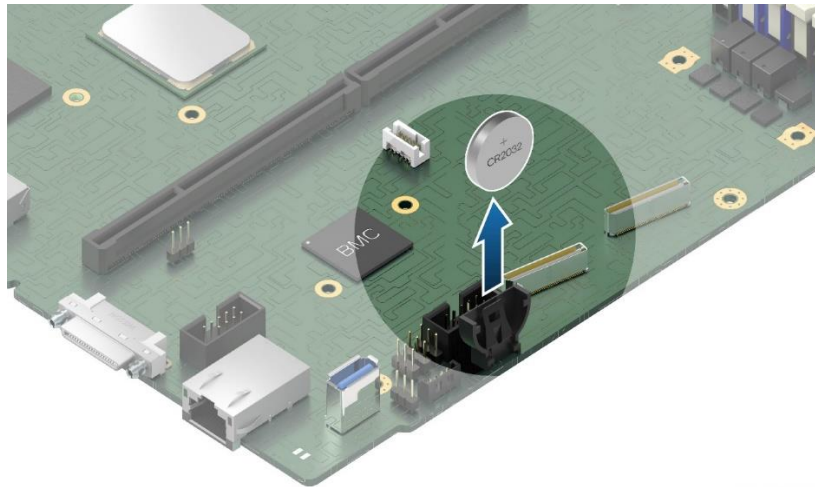
7. Place the new rail inside the chassis aligning the keying pins of the rail with the chassis inner wall.
8. Slide the rail into the chassis inner wall towards the back of the chassis until it locks into place.

7.22 System Battery Replacement

Required Tools and Supplies:

- Anti-static wrist strap and conductive foam pad (recommended)

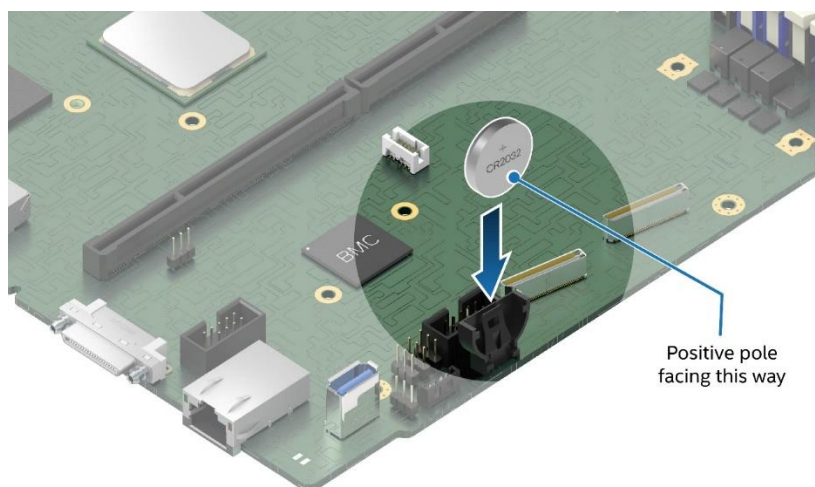
Before following the instructions in this section, remove the selected module from the server chassis (see [Section 7.1.1](#)), and then remove the riser assemblies from the module (see [Section 7.8](#)).



Ref #: TNP40142

Figure 282. Removing the System Battery

1. Locate the battery on the server board (see above figure).
2. Gently move the metal clip outward to release the battery.
3. Remove the old battery from the plastic socket.
4. Dispose of the battery according to local laws.
5. Remove the new lithium battery from its package.
6. Orient the battery so the positive pole is facing towards the right side of the module.



Ref #: TNP40153

Figure 283. Installing the System Battery

7. Insert the battery into the battery socket (see above figure).
8. Reinstall the riser assemblies (see [Section 7.8](#)).
9. Reinstall the module in the chassis (see [Section 7.1.2](#)).
10. Use the BIOS setup Utility to restore BIOS settings and reset the system time and date.

Appendix A. Getting Help

Available Intel support options with your Intel server system:

1. 24x7 support through Intel's support webpage at <https://www.intel.com/content/www/us/en/support/products/1201/server-products.html>

Information available at the support site includes:

- Latest BIOS, firmware, drivers, and utilities
- Product documentation, setup, and service guides
- Full product specifications, technical advisories, and errata
- Compatibility documentation for memory, hardware add-in cards, and operating systems
- Server and chassis accessory parts list for ordering upgrades or spare parts
- A searchable knowledge base to search for product information throughout the support site

Quick Links:

| | | | |
|--|---|--|--|
| <p>Use the following links for support on Intel Server Boards and Server Systems</p> | <p style="text-align: center;">Download Center</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/downloadserversw</p> | <p style="text-align: center;">BIOS Support Page</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/serverbios</p> | <p style="text-align: center;">Troubleshooting Boot Issue</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/troubleshootingboot</p> |
| <p>Use the following links for support on Intel® Data Center Block (DCB) Integrated Systems*</p> <p>* Intel DCB comes pre-populated with processors, memory, storage, and peripherals based on how it was ordered through the Intel Configure to Order tool.</p> | <p style="text-align: center;">Download Center</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/downloaddcb</p> | <p style="text-align: center;">Technical Support Documents</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/dcb</p> | <p style="text-align: center;">Warranty and Support Info</p> <div style="text-align: center;">  </div> <p style="text-align: center;">http://www.intel.com/support/dcbwarranty</p> |

2. If a solution cannot be found at Intel's support site, submit a service request via Intel's online service center at <https://supporttickets.intel.com/servicecenter?lang=en-US> . In addition, you can also view previous support requests. (Login required to access previous support requests)
3. Contact an Intel support representative using one of the support phone numbers available at <https://www.intel.com/content/www/us/en/support/contact-support.html> (charges may apply).

Intel also offers Partner Alliance Program members around-the-clock 24x7 technical phone support on Intel® server boards, server chassis, server RAID controller cards, and Intel® Server Management at <https://www.intel.com/content/www/us/en/partner-alliance/overview.html>

Note: The 24x7 support number is available after logging in to the Intel Partner Alliance website.

Warranty Information

To obtain warranty information, visit http://www.intel.com/p/en_US/support/warranty.

Appendix B. Memory Population Rules

Intel DDR4 DIMM Support Disclaimer:

Intel validates and will only provide support for system configurations where all installed DDR4 DIMMs have matching “Identical” or “Like” attributes. See [Table 4](#). A system configured concurrently with DDR4 DIMMs from different vendors will be supported by Intel if all other DDR4 “Like” DIMM attributes match.

Intel does not perform system validation testing nor will it provide support for system configurations where all populated DDR4 DIMMs do not have matching “Like” DIMM attributes as listed in [Table 4](#).

Intel will only provide support for Intel® server systems configured with DDR4 DIMMs that have been validated by Intel and are listed on Intel’s Tested Memory list for the given Intel® server product family.

Intel configures and ships pre-integrated L9 server systems. All DDR4 DIMMs within a given L9 server system as shipped by Intel will be identical. All installed DIMMs will have matching attributes as those listed in the “Identical” DDR4 DIMM4 Attributes column in [Table 4](#).

When purchasing more than one integrated L9 server system with the same configuration from Intel, Intel reserves the right to use “Like” DIMMs between server systems. At a minimum “Like” DIMMs will have matching DIMM attributes as listed in the table below. However, the DIMM model #, revision #, or vendor may be different.

For warranty replacement, Intel will make every effort to ship back an exact match to the one returned. However, Intel may ship back a validated “Like” DIMM. A “Like” DIMM may be from the same vendor but may not be the same revision # or model #, or it may be an Intel validated DIMM from a different vendor. At a minimum, all “Like” DIMMs shipped from Intel will match attributes of the original part according to the definition of “Like” DIMMs in the following table.

Table 4. DDR4 DIMM Attributes Table for “Identical” and “Like” DIMMs

| Attribute | “Identical” DDR4 DIMM Attributes | “Like” DDR4 DIMM Attributes | Possible DDR4 Attribute Values |
|--|----------------------------------|-----------------------------|--|
| <ul style="list-style-type: none"> • DDR4 DIMMs are considered “Identical” when ALL listed attributes between the DIMMs match • Two or more DDR4 DIMMs are considered “Like” DIMMs when all attributes minus the Vendor, and/or DIMM Part # and/or DIMM Revision#, are the same. | | | |
| Vendor | Match | Maybe Different | Memory Vendor Name |
| DIMM Part # | Match | Maybe Different | Memory Vendor Part # |
| DIMM Revision # | Match | Maybe Different | Memory Vendor Part Revision # |
| SDRAM Type | Match | Match | DDR4 |
| DIMM Type | Match | Match | RDIMM, LRDIMM |
| Speed (MHz) | Match | Match | 2666, 2933, 3200 |
| Voltage | Match | Match | 1.2V |
| DIMM Size (GB) | Match | Match | 8GB, 16GB, 32GB, 64GB, 128GB, 256GB |
| Organization | Match | Match | 1Gx72; 2Gx72; 4Gx72; 8Gx72; 16Gx72; 32Gx72 |
| DIMM Rank | Match | Match | 1R, 2R, 4R, 8R |
| DRAM Width | Match | Match | x4, x8 |
| DRAM Density | Match | Match | 8Gb, 16Gb |

B.1 DDR4 DIMM Population Rules

Note: Intel only supports mixed DDR4 DRAM DIMM configurations as defined in the Intel DDR4 Support Disclaimer above.

The following memory population rules apply when installing DIMMs:

- DDR4 DIMMs can only be installed in blue slots.
- Mixed DDR4 DIMM rules:
 - Mixing DDR4 DIMMs of different speeds and latencies is not supported within or across processors. If a mixed configuration is encountered, the BIOS attempts to operate at the highest common speed and the lowest latency possible.
 - x4 and x8 width DDR4 DIMMs may be mixed in the same channel.
 - Mixing of DDR4 DIMM types (RDIMM, LRDIMM, 3DS-RDIMM, 3DS-LRDIMM) within or across processors is not supported. This situation is a Fatal Error Halt in Memory Initialization.
- If channels A, C, E, and G are populated, they must be populated with same total DDR4 DIMM capacity per channel.
- If channels B, F, D, and H are populated, they must be populated with same total DDR4 DIMM capacity per channel.
- Memory slots associated with a given processor are unavailable if the corresponding processor socket is not populated.
- Processor sockets are self-contained and autonomous. However, all memory subsystem support (such as memory RAS and error management) in the BIOS Setup are applied commonly for each installed processor.
- For best system performance, memory must be installed in all eight channels for each installed processor.
- For best system performance in dual processor configurations, installed DDR4 DIMM type and population for DDR4 DIMMs configured to CPU 1 must match DDR4 DIMM type and population configured to CPU 0.

B.2 Intel® Optane™ Persistent Memory 200 Series Module Rules (Intel® Server Board D50TNP1SB Only)

All operating modes:

- Only Intel® Optane™ PMem modules are supported.
- In an Intel server system, support for Intel® Optane™ persistent memory 200 series module is only available on air-cooled systems.
- Intel® Optane™ persistent memory 200 series modules are only supported in DIMM slot 2 (black slot) and the slot 1 (blue slot) in the same memory channel must be populated with one DDR4 DIMM.
- Mixing of different DDR4 DIMM types on the system is not supported nor validated. Intel® Optane™ persistent memory 200 series and DDR4 must have the same capacity and type across or within all sockets.

Memory mode:

- Populate each memory channel with at least one DDR4 to maximize bandwidth.
- Intel® Optane™ persistent memory 200 series modules must be populated symmetrically for each installed processor (corresponding slots populated on either side of each processor) and across both processors.

App Direct mode:

- Minimum of one Intel® Optane™ persistent memory 200 series module for the board.

- Intel® Optane™ persistent memory 200 series modules must be populated symmetrically for each installed processor (corresponding slots populated on either side of each processor) and across both processors.

Table 5. Intel® Optane™ Persistent Memory 200 Series Module Support

| Processor SKU Level | Intel® Optane™ Persistent Memory 200 Series Capacity (GB) | Speed (MT/s) |
|--|---|--------------|
| Silver 4300 processors (Silver 4314 processor SKU only) | 128 | 2666 |
| | 256 | 2400 |
| | 512 | |
| Gold 5300 processors | 128 | 2933 |
| | 256 | 2666 |
| | 512 | 2400 |
| Gold 6300 processors* | 128 | 3200 |
| | 256 | 2933 |
| | 512 | 2666 |
| | | 2400 |
| Platinum 8300 processors | 128 | 3200 |
| | 256 | 2933 |
| | 512 | 2666 |
| | | 2400 |

Note: *Gold processor SKU 6330 maximum speed is 2933 (MT/s).

Table 6. Standard DDR4 DIMMs Compatible with Intel® Optane™ PMem Modules

| Type | Ranks per DIMM and Data Width | DIMM Size (GB) | |
|---|-------------------------------|-------------------|--------------------|
| | | 8 Gb DRAM density | 16 Gb DRAM density |
| RDIMM (PTH – up to 2933 MT/s) (SMT – up to 3200 MT/s) | SR x8 | N/A | N/A |
| | SR x4 | 16 | 32 |
| | DR x8 | 16 | 32 |
| | DR x4 | 32 | 64 |
| 3DS-RDIMM (PTH – up to 2933 MT/s) (SMT – up to 3200 MT/s) | QR x4 (2H) | N/A | 128 |
| | OR x4 (4H) | N/A | N/A |
| LRDIMM (PTH/SMT – up to 3200 MT/s) | QR x4 | 64 | 128 |
| 3DS-LRDIMM (PTH/SMT – up to 3200 MT/s) | QR x4 (2H) | N/A | 128 |
| | OR x4 (4H) | 128 | N/A |

Note: SR = Single Rank, DR = Dual Rank, QR = Quad Rank, OR = Oct Rank, H = Stack Height, PTH = Plated Through Hole, SMT = Surface-Mount Technology

Appendix C. System Status LED State Definitions

The Intel® D50TNP Modules include a control panel that provides push button controls and LED indicators for several features. This section provides a description for each front control panel feature.

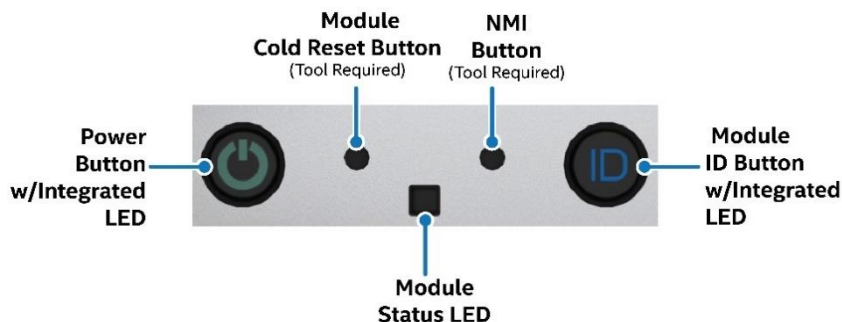


Figure 284. Front Control Panel Features

- Power button with integrated LED** – Toggles the module power on and off. This button also functions as a sleep button if enabled by an ACPI compliant operating system. Pressing this button sends a signal to the integrated BMC that either powers on or powers off the module. The integrated LED is a single color (green) and supports different indicator states as defined in the following table.

Note: After AC power is connected, several subsystems are initialized and low-level FRU discovery is performed. This process can take up to 90 seconds. When this process is completed, the ID LED will turn solid on, indicating that the system is ready to be powered on.

Table 7. Power / Sleep LED Functional States

| Power Mode | LED | Module State | Description |
|------------|-----|--------------|--|
| Non-ACPI | Off | Power-off | Module power is off, and the BIOS has not initialized the chipset. |
| | On | Power-on | Module power is on |
| ACPI | Off | S5 | Mechanical is off and the operating system has not saved any context to the hard disk. |
| | On | S0 | Module and the operating system are up and running. |

- Module ID button w/ integrated LED** – Toggles the integrated blue ID LED on and off. The module ID LED is used to identify an Intel® D50TNP Module in a chassis for maintenance when installed in a rack of similar server systems. The module ID LED can also be toggled on and off remotely using the IPMI “Chassis Identify” command that causes the LED to blink for 15 seconds.
- NMI Button** – When the NMI button is pressed, it puts the Intel® D50TNP Module in a halt state and issues a non-maskable interrupt (NMI). This process can be useful when performing diagnostics for a given issue where a memory download is necessary to help determine the cause of the problem. To prevent an inadvertent module halt, the actual NMI button is behind the front control panel faceplate where it is only accessible with the use of a small tipped tool like a pin or paper clip.
- Module cold reset button** – When pressed, this button reboots and re-initializes the Intel® D50TNP Module. Unlike the power button, the reset button does not disconnect the power to the module. It just starts the module’s power-on self-test (POST) sequence over again.

- **Module status LED** – The module status LED is a bi-color (green/amber) indicator that shows the current health of the module. The module status LED states are driven by the integrated platform management subsystem. [Table 8](#) provides a description of each supported LED state.

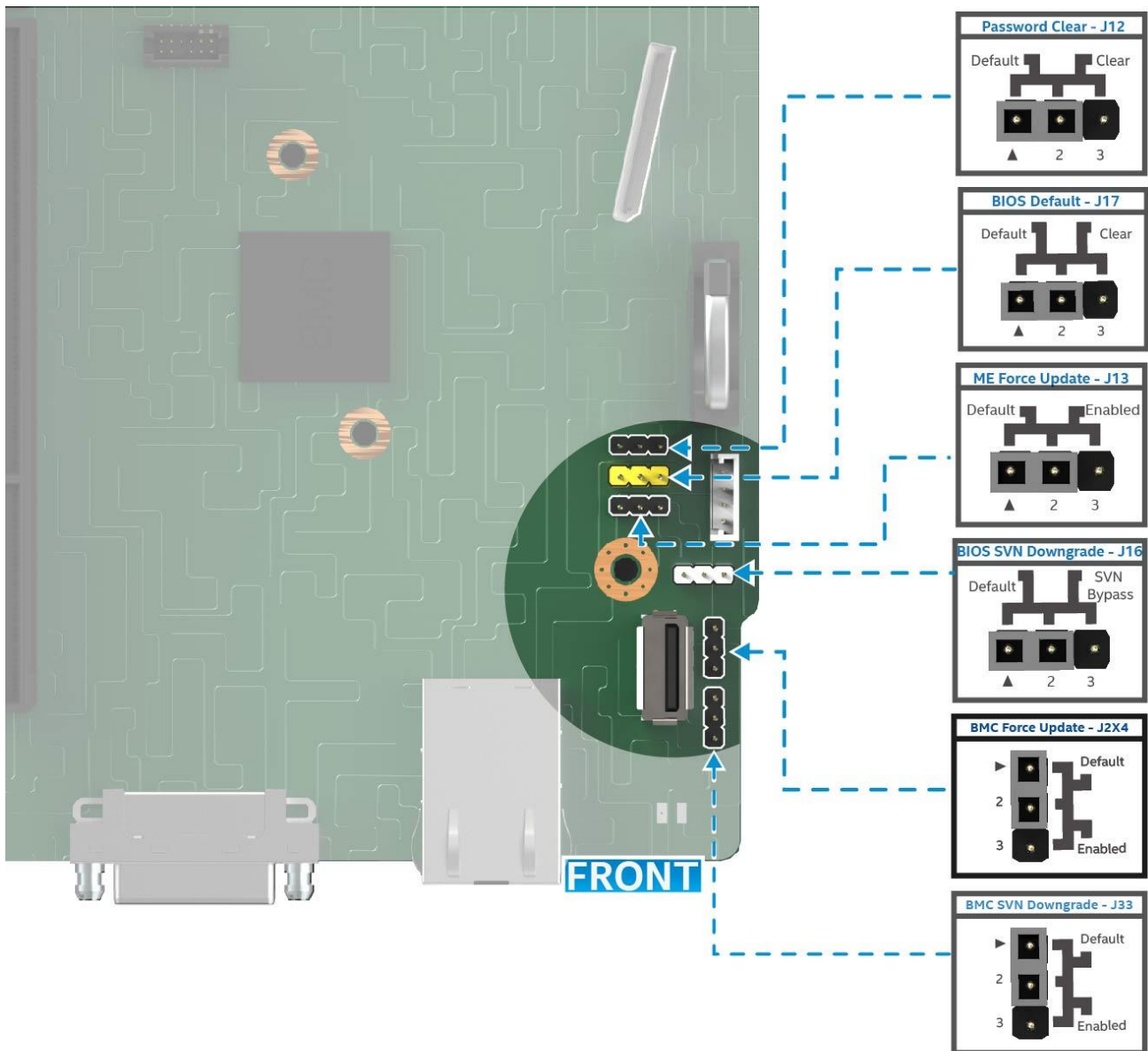
Table 8. Intel® D50TNP Module Status LED State Definitions

| LED State | Module State | BIOS Status Description |
|---|--|---|
| Off | No AC Power to system | <ul style="list-style-type: none"> • System power is not present. • Module is in EuP Lot6 off mode. |
| Solid green | Module is operating normally. | <ul style="list-style-type: none"> • Module is in S5 soft-off state. • Module is running (in S0 State) and its status is healthy. The module is not exhibiting any errors. Source power is present BMC has booted and manageability functionality is up and running. • After a BMC reset, and in conjunction with the module ID LED solid on, the BMC is booting Linux*. Control has been passed from BMC uBoot to BMC Linux*. The BMC is in this state for roughly 10–20 seconds. |
| Blinking green | Module is operating in a degraded state although still functioning, or module is operating in a redundant state but with an impending failure warning. | <ul style="list-style-type: none"> • Redundancy loss such as power-supply or fan. Applies only if the associated platform subsystem has redundancy capabilities. • Fan warning or failure when the number of fully operational fans is less than the minimum number needed to cool the system. • Non-critical threshold crossed – Temperature, voltage, input power to power supply, output current for main power rail from power supply and Processor Thermal Control (Therm Ctrl) sensors. • Power supply predictive failure occurred while redundant power supply configuration was present. • Unable to use all installed memory (more than 1 DIMM installed). • Correctable Errors over a threshold and migrating to a spare DIMM (memory sparing). This indicates that the module no longer has spared DIMMs (a redundancy lost condition). • In mirrored configuration, when memory mirroring takes place and the module loses memory redundancy. • Battery failure. • BMC executing in uBoot. (Indicated by module ID LED blinking at 3 Hz while Status blinking at 1 Hz). Module in degraded state (no manageability). BMC uBoot is running but has not transferred control to BMC Linux*. The module is in this state 6–8 seconds after BMC reset while it pulls the Linux* image into flash. • BMC Watchdog has reset the BMC. • Power Unit sensor offset for configuration error is asserted. • SSD Hot Swap Controller (HSC) is off-line or degraded. |
| Blinking amber and green alternatively | Module is initializing after AC power is applied | <ul style="list-style-type: none"> • PFR in the process of updating/authenticating/recovering when AC power is connected, module firmware being updated. • Module not ready to take power button event/signal. |
| Blinking amber | Module is operating in a degraded state with an impending failure warning, although still functioning. Module is likely to fail. | <ul style="list-style-type: none"> • Critical threshold crossed – Voltage, temperature, input power to power supply, output current for main power rail from power supply and PROCHOT (Therm Ctrl) sensors. • VRD Hot asserted. • Minimum number of fans to cool the system not present or failed. • Storage drive fault. • Power Unit Redundancy sensor – Insufficient resources offset (indicates not enough power supplies present). • In non-sparing and non-mirroring mode, if the threshold of correctable errors is crossed within the window. • Invalid firmware image detected during boot or firmware update. |

| LED State | Module State | BIOS Status Description |
|--------------------|--|---|
| Solid amber | Critical/non-recoverable – module is halted. Fatal alarm – module has failed or shut down. | <ul style="list-style-type: none"> • CPU CATERR signal asserted. • MSID mismatch detected (CATERR also asserts for this case). • CPU 0 is missing. • CPU Thermal Trip. • No power good – power fault. • DIMM failure when there is only 1 DIMM present and hence no good memory present. • Runtime memory uncorrectable error in non-redundant mode. • DIMM Thermal Trip or equivalent. • SSB Thermal Trip or equivalent. • Processor ERR2 signal asserted. • BMC/Video memory test failed (module ID LED shows blue/solid-on for this condition). • Both uBoot BMC firmware images are bad (module ID LED shows blue/solid-on for this condition). • 240 VA fault. • Fatal Error in processor initialization: <ul style="list-style-type: none"> ○ Processor family not identical ○ Processor model not identical ○ Processor core/thread counts not identical ○ Processor cache size not identical ○ Unable to synchronize processor frequency ○ Unable to synchronize UPI link frequency • BMC fail authentication with non-recoverable condition, system hang at T-1; boot Platform Controller Hub (PCH) only, system hang; PIT failed, system lockdown |

Appendix D. Onboard Configuration and Service Jumpers

The Intel® Server Boards D50TNP1SB and D50TNP1SBCR include several jumper blocks to configure, protect, or recover specific features of the server board. The following figure identifies the location of each jumper block on the server board. Pin 1 of each jumper is identified by the arrowhead (▼) silkscreened on the server board next to the pin. The following sections describe how each jumper is used.



Ref #: TNPI0036

Figure 285. Reset and Recovery Jumper Block Location

D.1 BIOS Default Jumper (BIOS DFLT – J17)

This jumper resets BIOS options, configured using the BIOS Setup Utility, back to their original default factory settings.

Note: This jumper does not reset administrator or user passwords. To reset passwords, the password clear jumper must be used.

To use the BIOS default jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis
3. Remove the riser assemblies from the module.
4. Move the “BIOS DFLT” (J17) jumper from pins 1–2 (normal operation) to pins 2–3 (set BIOS defaults).
5. Wait five seconds then move the “BIOS DFLT” (J17) jumper back to pins 1–2.
6. Reinstall the riser assemblies.
7. Reinstall module in the chassis.

Note: The module automatically powers on if AC power is connected to the server chassis.

8. Power on the server module and press <F2> during POST to access the BIOS Setup Utility to configure and save desired BIOS options.

After resetting BIOS options using the BIOS default jumper, the Error Manager Screen in the BIOS Setup Utility displays two errors:

- 0012 System RTC date/time not set
- 5220 BIOS Settings reset to default settings

The system time and date will need to be reset.

D.2 Password Clear Jumper (PASSWD_CLR – J12)

This jumper causes both the user password and the administrator password to be cleared if they were set. The operator should be aware that this condition creates a security gap until passwords have been configured again through the BIOS Setup Utility. This is the only method by which the administrator and user passwords can be cleared unconditionally. Other than this jumper, passwords can only be set or cleared by changing them explicitly in BIOS Setup. No method of resetting BIOS configuration settings to default values affects either the administrator or user passwords.

To use the password clear jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis
3. Remove the riser assemblies from the module.
4. Move the “PASSWD_CLR” (J12) jumper from pins 1–2 (default) to pins 2–3 (password clear position).
5. Reinstall the riser assemblies
6. Reinstall the module in the chassis.
7. Power on the module and press <F2> during POST to access the BIOS Setup Utility.
8. Verify the password clear operation was successful by viewing the Error Manager screen. Two errors should be logged:
 - 5221 Passwords cleared by jumper
 - 5224 Password clear jumper is set

9. Exit the BIOS Setup Utility and power down the module.
10. Remove the module from the chassis and remove the riser assemblies from the module.
11. Move the “PASSWD_CLR” (J12) jumper back to pins 1–2 (default).
12. Reinstall the riser assemblies
13. Reinstall the module in the chassis.
14. Power up the server module.
15. Intel strongly recommends to boot into BIOS Setup immediately, navigate to the Security tab, and set the administrator and user passwords if intending to use BIOS password protection.

D.3 Intel® Management Engine (Intel® ME) Firmware Force Update Jumper (ME_FRC_UPDT – J13)

When the Intel® ME firmware force update jumper is moved from its default position, the Intel® ME is forced to operate in a reduced minimal operating capacity. This jumper should only be used if the Intel® ME firmware has gotten corrupted and requires reinstallation.

Note: The Intel® ME firmware update files are included in the system update packages (SUP) posted to Intel's download center. See [Table 1](#).

To use the Intel® ME firmware force update jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis
3. Remove the riser assemblies from the module.
4. Move the “ME FRC UPDT” (J13) jumper from pins 1–2 (default) to pins 2–3 (force update position).
5. Reinstall the riser assemblies
6. Reinstall the module in the chassis.
7. Power on the server module.
8. Boot to the Extensible Firmware Interface (EFI) shell.
9. Change directories to the folder containing the update files.
10. Update the Intel® ME firmware using the following command:

```
Sysfwupdt -u <version#>_UpdateCapsule.bin
```

11. When the update has successfully completed, power off the module.
12. Remove the module from the chassis
13. Remove the riser assemblies from the module.
14. Move the “ME FRC UPDT” (J13) jumper back to pins 1–2 (default).
15. Reinstall the riser assemblies
16. Reinstall the module in the chassis.
17. Power on the server module.

D.4 BMC Force Update Jumper (BMC_FRC_UPDT – J2X4)

The BMC force update jumper is used to put the BMC in boot recovery mode for a low-level update. It causes the BMC to abort its normal boot process and stay in the bootloader without executing any Linux* code. This jumper should only be used if the BMC firmware has become corrupted and requires reinstallation.

Note: The BMC firmware update files are included in the SUP posted to Intel's download center. See [Table 1](#).

To use the BMC force update jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis
3. Remove the riser assemblies from the module.
4. Move the “BMC FRC UPDT” (J2X4) jumper from pins 1–2 (default) to pins 2–3 (force update position).
5. Reinstall the riser assemblies
6. Reinstall the module in the chassis.
7. Power on the server module.
8. Boot to the EFI shell.
9. Change directories to the folder containing the update files.
10. Update the BMC firmware using the following command:

```
sysfwupdt.efi -u <filename.bin>
```

11. When the update has successfully completed, power down the module.
12. Remove the module from the chassis and remove the riser assemblies from the module.
13. Move the “BMC FRC UPDT” (J2X4) jumper back to pins 1–2 (default).
14. Reinstall the riser assemblies
15. Reinstall the module in the chassis.
16. Power on the server module.
17. Boot to the EFI shell.
18. Change directories to the folder containing the update files.
19. Reinstall the board/system SDR data by running the FRUSDR Utility.
20. After the SDRs have been loaded, reboot the module.

D.5 BIOS SVN Downgrade (SVN_Bypass – J16)

The BIOS SVN Downgrade Jumper is labeled SVN_BYPASS on the server board. When this jumper is moved from its default pin position (pins 1–2), the move allows the module firmware (including BIOS) in the PFR-controlled PCH capsule file to be downgraded to a lower Security Version Number (SVN). This jumper is used when there is a need for the module to power on using BIOS revision with lower SVN.

Caution: Downgrading to an older version of BIOS may result in the loss of functionality and security features that are present in a higher SVN.

Caution: When downgrading to an older version of BIOS, modules may end up with a firmware stack combination that is not supported, and therefore could experience unpredictable behavior.

Note: Latest system update packages are included in the SUP posted to Intel's download center. See [Table 1](#).

To use the SVN Bypass jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis

3. Remove the riser assemblies from the module.
4. Move the “SVN_Bypass” (J16) jumper from pins 1–2 (default) to pins 2–3 (SVN Bypass).
5. Reinstall the riser assemblies.
6. Reinstall the module in the chassis.
7. Power on the server module. The system automatically boots to the EFI shell.
8. Update the BIOS using the recovery BIOS update instructions provided with the system update package.
9. After the BIOS update has successfully completed, power down the module.
10. Remove the module from the chassis and remove the riser assemblies from the module.
11. Move the “SVN_Bypass” (J16) jumper back to pins 1–2 (default).
12. Reinstall the module in the chassis.
13. Power on the module. During POST, press <F2> to access the BIOS Setup Utility to configure and save desired BIOS options.

D.6 BMC SVN Downgrade (J33)

When this jumper is moved from its default pin position (pins 1–2), it allows the module BMC firmware in the PFR-controlled BMC capsule file to be downgraded to lower Security Version Number (SVN). This jumper is used when there is a need for the module to power on using a BMC revision with lower SVN.

Caution: Downgrading to a BMC version with lower SVN may result in the loss of functionality and security features that are present in a higher SVN but was not implemented in the lower SVN.

Caution: When downgrading to an older version of BMC, modules may end up with a firmware stack combination that is not supported, and therefore could experience unpredictable behavior.

Note: Latest system update packages are included in the SUP posted to Intel’s download center. See [Table 1](#).

To use the BMC SVN Downgrade jumper, perform the following steps:

1. Power down the server module.
2. Remove the module from the chassis
3. Remove the riser assemblies from the module.
4. Using tweezers, move the BMC SVN Downgrade jumper (J33) from pins 1–2 (default) to pins 2–3 (Enabled).
5. Reinstall the riser assemblies.
6. Reinstall the module in the chassis.
7. Power on the server module. The system automatically boots to the EFI shell.
8. Update the BMC using the recovery BMC update instructions provided with the system update package.
9. After the BMC update has successfully completed, power down the module.
10. Remove the module from the chassis and remove the riser assemblies from the module.
11. Using tweezers, move the BMC SVN Downgrade jumper (J33) jumper back to pins 1–2 (default).
12. Reinstall the riser assemblies
13. Reinstall the module in the chassis.
14. Power on the server module.

Appendix E. POST Code Diagnostic LED Decoder

As an aid in troubleshooting a system hang that occurs during a system POST process, the server board includes a bank of eight POST code diagnostic LEDs on the front edge of the server board.

During the system boot process, Memory Reference Code (MRC) and system BIOS execute several memory initialization and platform configuration routines, each of which is assigned a hexadecimal POST code number.

As each routine is started, the given POST code number is displayed to the POST code diagnostic LEDs on the front edge of the server board.

During a POST system hang, the displayed POST code can be used to identify the last POST routine that was run before the error occurring, helping to isolate the possible cause of the hang condition.

Each POST code is represented by eight LEDs, four green LEDs and four amber LEDs. The POST codes are divided into two nibbles, an upper nibble and a lower nibble. The upper nibble bits are represented by amber diagnostic LEDs and the lower nibble bits are represented by green diagnostics. If the bit is set, the corresponding LED is lit. If the bit is clear, the corresponding LED is off. For each set of nibble bits, LED 0 represents the least significant bit (LSB) and LED 3 represents the most significant bit (MSB).

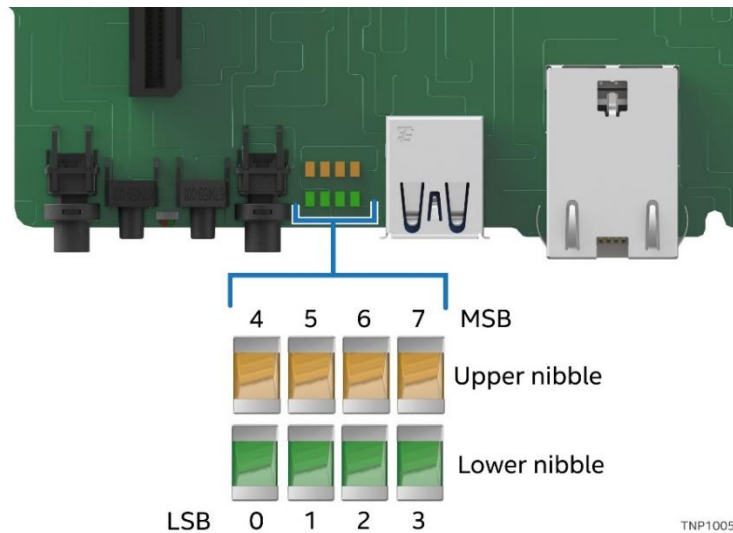


Figure 286. Onboard POST Diagnostic LEDs

In the following example, the BIOS sends a value of AC to the diagnostic LED decoder. The LEDs are decoded as shown in the following table.

Table 9. POST Progress Code LED Example

| LEDs | | Upper Nibble AMBER LEDs | | | | Lower Nibble GREEN LEDs | | | |
|---------------|-------------|-------------------------|--------|-----------|--------|-------------------------|-----------|--------|--------|
| | | MSB | | | | | | | LSB |
| | | LED #7 | LED #6 | LED #5 | LED #4 | LED #3 | LED #2 | LED #1 | LED #0 |
| | | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h |
| Status | | ON | OFF | ON | OFF | ON | ON | OFF | OFF |
| Read Value | Binary | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| | Hexadecimal | Ah | | | | Ch | | | |
| Result | | ACh | | | | | | | |

Upper nibble bits = 1010b = Ah; Lower nibble bits = 1100b = Ch; the two Hex Nibble values are combined to create a single ACh POST Progress Code.

E.1 Early POST Memory Initialization MRC Diagnostic Codes

Memory initialization at the beginning of POST includes multiple functions: discovery, channel training, validation that the DIMM population is acceptable and functional, initialization of the IMC and other hardware settings, and initialization of applicable RAS configurations.

The MRC progress codes are displayed to the diagnostic LEDs that show the execution point in the MRC operational path at each step.

Table 10. Memory Reference Code (MRC) Progress Codes

| Post Code (Hex) | Upper Nibble | | | | Lower Nibble | | | | Description |
|-----------------|--------------|----|----|----|--------------|----|----|----|---|
| | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h | |
| B0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Detect DIMM population |
| B1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | Set DDR4 frequency |
| B2 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | Gather remaining SPD data |
| B3 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | Program registers on the memory controller level |
| B4 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | Evaluate RAS modes and save rank information |
| B5 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | Program registers on the channel level |
| B6 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | Perform the JEDEC defined initialization sequence |
| B7 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | Train DDR4 ranks |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Train DDR4 ranks |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | Train DDR4 ranks – Read DQ/DQS training |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | Train DDR4 ranks – Receive enable training |
| 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | Train DDR4 ranks – Write DQ/DQS training |
| 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | Train DDR4 ranks – DDR channel training done |
| B8 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | Initialize CLTT/OLTT |
| B9 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | Hardware memory test and init |
| BA | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | Execute software memory init |
| BB | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | Program memory map and interleaving |
| BC | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | Program RAS configuration |
| BE | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | Execute BSSA RMT |
| BF | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | MRC is done |

If a major memory initialization error occurs, preventing the system from booting with data integrity, the MRC displays a fatal error code on the diagnostic LEDs, and a system halt command is executed. Fatal MRC error halts do not change the state of the system status LED and they do not get logged as SEL events. [Table 11](#) lists all MRC fatal errors that are displayed to the diagnostic LEDs.

Note: Fatal MRC errors display POST error codes that may be the same as BIOS POST progress codes displayed later in the POST process.

Table 11. Memory Reference Code (MRC) Fatal Error Codes

| Post Code (Hex) | Upper Nibble | | | | Lower Nibble | | | | Description |
|--------------------|--------------|----|----|----|--------------|----|----|----|--|
| | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h | |
| E8 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | No usable memory error 01h = No memory was detected from SPD read, or invalid config that causes no operable memory. 02h = Memory DIMMs on all channels of all sockets are disabled due to hardware memtest error. 03h = No memory installed. All channels are disabled. |
| E9 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | Memory is locked by Intel® TXT and is inaccessible |
| EA | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | DDR4 channel training error 01h = Error on read DQ/DQS (Data/Data Strobe) init 02h = Error on Receive Enable 03h = Error on Write Leveling 04h = Error on write DQ/DQS (Data/Data Strobe) |
| EB | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | Memory test failure 01h = Software memtest failure. 02h = Hardware memtest failed. |
| ED | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | DIMM configuration population error 01h = Different DIMM types (RDIMM, LRDIMM) are detected installed in the system. 02h = Violation of DIMM population rules. 03h = The 3rd DIMM slot cannot be populated when QR DIMMs are installed. 04h = UDIMMs are not supported. 05h = Unsupported DIMM Voltage. |
| EF | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | Indicates a CLTT table structure error |

E.2 BIOS POST Progress Codes

The following table provides a list of all POST progress codes.

Table 12. BIOS POST Progress Codes

| Post Code (Hex) | Upper Nibble | | | | Lower Nibble | | | | Description |
|---|--------------|----|----|----|--------------|----|----|----|--|
| | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h | |
| Security (SEC) Phase | | | | | | | | | |
| 01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | First POST code after CPU reset |
| 02 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | Microcode load begin |
| 03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | CRAM initialization begin |
| 04 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | PEI Cache When Disabled |
| 05 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | SEC Core At Power On Begin. |
| 06 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | Early CPU initialization during SEC Phase. |
| Intel® UPI RC (Fully leverage without platform change) | | | | | | | | | |
| A1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | Collect info such as SBSP, boot mode, reset type, etc. |
| A3 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | Setup minimum path between SBSP and other sockets |
| A6 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | Sync up with PBSPs |
| A7 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | Topology discovery and route calculation |
| A8 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | Program final route |
| A9 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | Program final IO SAD setting |
| AA | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | Protocol layer and other uncore settings |
| AB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | Transition links to full speed operation |
| AE | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | Coherency settings |
| AF | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | KTI initialization done |
| Pre-EFI Initialization (PEI) Phase | | | | | | | | | |
| 10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | PEI Core |
| 11 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | CPU PEIM |
| 15 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | Platform Type Init |
| 19 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | Platform PEIM Init |
| Integrated I/O (IIO) Progress Codes | | | | | | | | | |
| E0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | lio Early Init Entry |
| E1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | lio Pre-link Training |
| E2 | 1 | 1 | 1 | 0 | 0 | | 1 | 0 | lio EQ Programming |
| E3 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | lio Link Training |
| E4 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | Internal Use |
| E5 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | lio Early Init Exit |
| E6 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | lio Late Init Entry |
| E7 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | lio PCIe Ports Init |
| E8 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | lio IOAPIC init |
| E9 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | lio VTD Init |
| EA | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | lio IOAT Init |
| EB | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | lio DXF Init |
| EC | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | lio NTB Init |
| ED | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | lio Security Init |
| EE | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | lio Late Init Exit |
| EF | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | lio ready to boot |

| Post Code (Hex) | Upper Nibble | | | | Lower Nibble | | | | Description |
|--|--------------|----|----|----|--------------|----|----|----|---------------------------------|
| | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h | |
| MRC Progress Codes – At this point the MRC Progress Code sequence is executed | | | | | | | | | |
| 31 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | Memory Installed |
| 32 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | CPU PEIM (CPU Init) |
| 33 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | CPU PEIM (Cache Init) |
| 34 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | CPU BSP Select |
| 35 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | CPU AP Init |
| 36 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | CPU SMM Init |
| 4F | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | DXE IPL started |
| Memory Feature Progress Codes | | | | | | | | | |
| C1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | Memory POR check |
| C2 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | Internal Use |
| C3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | Internal Use |
| C4 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | Internal Use |
| C5 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | Memory Early Init |
| C6 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | Display DIMM info in debug mode |
| C7 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | JEDEC Nvdimmm training |
| C9 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | Setup SVL and Scrambling |
| CA | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | Internal Use |
| CB | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | Check RAS support |
| CC | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | PMem ADR Init |
| CD | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | Internal Use |
| CE | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | Memory Late Init |
| CF | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | Determine MRC boot mode |
| D0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | MKTME Early Init |
| D1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | SGX Early Init |
| D2 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | Memory Margin Test |
| D3 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | Internal Use |
| D5 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | Internal Use |
| D6 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | Offset Training Result |
| Driver Execution Environment (DXE) Phase | | | | | | | | | |
| 60 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | DXE Core started |
| 62 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | DXE Setup Init |
| 68 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | DXE PCI Host Bridge Init |
| 69 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | DXE NB Init |
| 6A | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | DXE NB SMM Init |
| 70 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | DXE SB Init |
| 71 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | DXE SB SMM Init |
| 72 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | DXE SB devices Init |
| 78 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | DXE ACPI Init |
| 79 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | DXE CSM Init |
| 7D | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | DXE Removable Media Detect |
| 7E | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | DXE Removable Media Detected |
| 90 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | DXE BDS started |
| 91 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | DXE BDS connect drivers |
| 92 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | DXE PCI bus begin |

| Post Code (Hex) | Upper Nibble | | | | Lower Nibble | | | | Description |
|------------------|--------------|----|----|----|--------------|----|----|----|----------------------------------|
| | 8h | 4h | 2h | 1h | 8h | 4h | 2h | 1h | |
| 93 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | DXE PCI Bus HPC Init |
| 94 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | DXE PCI Bus enumeration |
| 95 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | DXE PCI Bus resource requested |
| 96 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | DXE PCI Bus assign resource |
| 97 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | DXE CON_OUT connect |
| 98 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | DXE CON_IN connect |
| 99 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | DXE SIO Init |
| 9A | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | DXE USB start |
| 9B | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | DXE USB reset |
| 9C | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | DXE USB detect |
| 9D | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | DXE USB enable |
| A1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | DXE IDE begin |
| A2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | DXE IDE reset |
| A3 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | DXE IDE detect |
| A4 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | DXE IDE enable |
| A5 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | DXE SCSI begin |
| A6 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | DXE SCSI reset |
| A7 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | DXE SCSI detect |
| A8 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | DXE SCSI enable |
| AB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | DXE SETUP start |
| AC | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | DXE SETUP input wait |
| AD | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | DXE Ready to Boot |
| AE | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | DXE Legacy Boot |
| AF | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | DXE Exit Boot Services |
| B0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | RT Set Virtual Address Map Begin |
| B1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | RT Set Virtual Address Map End |
| B2 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | DXE Legacy Option ROM init |
| B3 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | DXE Reset system |
| B4 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | DXE USB Hot plug |
| B5 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | DXE PCI BUS Hot plug |
| B8 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | PWRBTN Shutdown |
| B9 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | SLEEP Shutdown |
| C0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | End of DXE |
| C7 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | DXE ACPI Enable |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Clear POST Code |
| S3 Resume | | | | | | | | | |
| E0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | S3 Resume PEIM (S3 started) |
| E1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | S3 Resume PEIM (S3 boot script) |
| E2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | S3 Resume PEIM (S3 Video Repost) |
| E3 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | S3 Resume PEIM (S3 OS wake) |

Appendix F. POST Error Codes

Most error conditions encountered during POST are reported using POST error codes. These codes represent specific failures, warnings, or information. POST error codes may be displayed in the error manager display screen and are always logged to the System Event Log (SEL). Logged events are available to system management applications, including remote and Out of Band (OOB) management.

There are exception cases in early initialization where system resources are not adequately initialized for handling POST Error Code reporting. These cases are primarily fatal error conditions resulting from initialization of processors and memory, and they are handled by a diagnostic LED display with a system halt.

Table 13 lists the supported POST error codes. Each error code is assigned an error type that determines the action the BIOS takes when the error is encountered. Error types include minor, major, and fatal. The BIOS action for each is defined as follows:

- **Minor:** An error message may be displayed to the screen or to the BIOS Setup Error Manager and the POST error code is logged to the SEL. The system continues booting in a degraded state. The user may want to replace the erroneous unit. The “POST Error Pause” option setting in the BIOS Setup does not affect this error.
- **Major:** An error message is displayed to the Error Manager screen and an error is logged to the SEL. If the BIOS Setup option “Post Error Pause” is enabled, operator intervention is required to continue booting the system. If the BIOS Setup option “POST Error Pause” is disabled, the system continues to boot.

Note: For 0048 “Password check failed”, the system halts and then, after the next reset/reboot, displays the error code on the Error Manager screen.

- **Fatal:** If the system cannot boot, POST halts the system and displays the following message:

```
Unrecoverable fatal error found. System will not boot until the error is
resolved.
Press <F2> to enter setup.
```

When the **<F2>** key on the keyboard is pressed, the error message is displayed on the Error Manager screen and an error is logged to the system event log (SEL) with the POST error code. The system cannot boot unless the error is resolved. The faulty component must be replaced. The “POST Error Pause” option setting in the BIOS Setup does not affect this error.

Note: The POST error codes in the following table are common to all current generation Intel® server platforms. Features present on a given server board/system determine which of the listed error codes are supported.

Table 13. POST Error Messages and Handling

| Error Code | Error Message | Action message | Type |
|------------|---|---|-------|
| 0012 | System RTC date/time not set | | Major |
| 0048 | Password check failed | Put right password. | Major |
| 0140 | PCI component encountered a PERR error | | Major |
| 0141 | PCI resource conflict | | Major |
| 0146 | PCI out of resources error | Enable Memory Mapped I/O above 4 GB item at SETUP to use 64-bit MMIO. | Major |
| 0191 | Processor core/thread count mismatch detected | Use identical CPU type. | Fatal |
| 0192 | Processor cache size mismatch detected | Use identical CPU type. | Fatal |
| 0194 | Processor family mismatch detected | Use identical CPU type. | Fatal |
| 0195 | Processor Intel(R) UPI link frequencies unable to synchronize | | Fatal |
| 0196 | Processor model mismatch detected | Use identical CPU type. | Fatal |
| 0197 | Processor frequencies unable to synchronize | Use identical CPU type. | Fatal |
| 5220 | BIOS Settings reset to default settings | | Major |
| 5221 | Passwords cleared by jumper | | Major |
| 5224 | Password clear jumper is Set | Recommend reminding user to install BIOS password as BIOS admin password is the master keys for several BIOS security features. | Major |
| 8130 | CPU 0 disabled | | Major |
| 8131 | CPU 1 disabled | | Major |
| 8160 | CPU 0 unable to apply microcode update | | Major |
| 8161 | CPU 1 unable to apply microcode update | | Major |
| 8170 | CPU 0 failed Self-Test (BIST) | | Major |
| 8171 | CPU 1 failed Self-Test (BIST) | | Major |
| 8180 | CPU 0 microcode update not found | | Minor |
| 8181 | CPU 1 microcode update not found | | Minor |
| 8190 | Watchdog timer failed on last boot. | | Major |
| 8198 | OS boot watchdog timer failure. | | Major |
| 8300 | Baseboard Management Controller failed self-test. | | Major |
| 8305 | Hot Swap Controller failure | | Major |
| 83A0 | Management Engine (ME) failed self-test. | | Major |
| 83A1 | Management Engine (ME) Failed to respond. | | Major |
| 84F2 | Baseboard management controller failed to respond | | Major |
| 84F3 | Baseboard Management Controller in Update Mode. | | Major |
| 84F4 | Baseboard Management Controller Sensor Data Record empty. | Update right SDR. | Major |
| 84FF | System Event Log full | Clear SEL through EWS or SELVIEW utility. | Minor |
| 85FC | Memory component could not be configured in the selected RAS mode | | Major |
| 8501 | Memory Population Error | Plug DIMM at right population. | Major |
| 8502 | PMem invalid DIMM population found on the system. | Populate valid POR PMem DIMM population. | Major |
| 8520 | Memory failed test/initialization CPU0_DIMM_A1 | Remove the disabled DIMM. | Major |
| 8521 | Memory failed test/initialization CPU0_DIMM_A2 | Remove the disabled DIMM. | Major |
| 8522 | Memory failed test/initialization CPU0_DIMM_A3 | Remove the disabled DIMM. | Major |

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| Error Code | Error Message | Action message | Type |
|----------------------|--|---------------------------|-------|
| 8523 | Memory failed test/initialization CPU0_DIMM_B1 | Remove the disabled DIMM. | Major |
| 8524 | Memory failed test/initialization CPU0_DIMM_B2 | Remove the disabled DIMM. | Major |
| 8525 | Memory failed test/initialization CPU0_DIMM_B3 | Remove the disabled DIMM. | Major |
| 8526 | Memory failed test/initialization CPU0_DIMM_C1 | Remove the disabled DIMM. | Major |
| 8527 | Memory failed test/initialization CPU0_DIMM_C2 | Remove the disabled DIMM. | Major |
| 8528 | Memory failed test/initialization CPU0_DIMM_C3 | Remove the disabled DIMM. | Major |
| 8529 | Memory failed test/initialization CPU0_DIMM_D1 | Remove the disabled DIMM. | Major |
| 852A | Memory failed test/initialization CPU0_DIMM_D2 | Remove the disabled DIMM. | Major |
| 852B | Memory failed test/initialization CPU0_DIMM_D3 | Remove the disabled DIMM. | Major |
| 852C | Memory failed test/initialization CPU0_DIMM_E1 | Remove the disabled DIMM. | Major |
| 852D | Memory failed test/initialization CPU0_DIMM_E2 | Remove the disabled DIMM. | Major |
| 852E | Memory failed test/initialization CPU0_DIMM_E3 | Remove the disabled DIMM. | Major |
| 852F | Memory failed test/initialization CPU0_DIMM_F1 | Remove the disabled DIMM. | Major |
| 8530 | Memory failed test/initialization CPU0_DIMM_F2 | Remove the disabled DIMM. | Major |
| 8531 | Memory failed test/initialization CPU0_DIMM_F3 | Remove the disabled DIMM. | Major |
| 8532 | Memory failed test/initialization CPU0_DIMM_G1 | Remove the disabled DIMM. | Major |
| 8533 | Memory failed test/initialization CPU0_DIMM_G2 | Remove the disabled DIMM. | Major |
| 8534 | Memory failed test/initialization CPU0_DIMM_G3 | Remove the disabled DIMM. | Major |
| 8535 | Memory failed test/initialization CPU0_DIMM_H1 | Remove the disabled DIMM. | Major |
| 8536 | Memory failed test/initialization CPU0_DIMM_H2 | Remove the disabled DIMM. | Major |
| 8537 | Memory failed test/initialization CPU0_DIMM_H3 | Remove the disabled DIMM. | Major |
| 8538 | Memory failed test/initialization CPU1_DIMM_A1 | Remove the disabled DIMM. | Major |
| 8539 | Memory failed test/initialization CPU1_DIMM_A2 | Remove the disabled DIMM. | Major |
| 853A | Memory failed test/initialization CPU1_DIMM_A3 | Remove the disabled DIMM. | Major |
| 853B | Memory failed test/initialization CPU1_DIMM_B1 | Remove the disabled DIMM. | Major |
| 853C | Memory failed test/initialization CPU1_DIMM_B2 | Remove the disabled DIMM. | Major |
| 853D | Memory failed test/initialization CPU1_DIMM_B3 | Remove the disabled DIMM. | Major |
| 853E | Memory failed test/initialization CPU1_DIMM_C1 | Remove the disabled DIMM. | Major |
| 853F (Go to 85C0) | Memory failed test/initialization CPU1_DIMM_C2 | Remove the disabled DIMM. | Major |
| 8540 | Memory disabled.CPU0_DIMM_A1 | Remove the disabled DIMM. | Major |
| 8541 | Memory disabled.CPU0_DIMM_A2 | Remove the disabled DIMM. | Major |
| 8542 | Memory disabled.CPU0_DIMM_A3 | Remove the disabled DIMM. | Major |
| 8543 | Memory disabled.CPU0_DIMM_B1 | Remove the disabled DIMM. | Major |
| 8544 | Memory disabled.CPU0_DIMM_B2 | Remove the disabled DIMM. | Major |
| 8545 | Memory disabled.CPU0_DIMM_B3 | Remove the disabled DIMM. | Major |
| 8546 | Memory disabled.CPU0_DIMM_C1 | Remove the disabled DIMM. | Major |
| 8547 | Memory disabled.CPU0_DIMM_C2 | Remove the disabled DIMM. | Major |
| 8548 | Memory disabled.CPU0_DIMM_C3 | Remove the disabled DIMM. | Major |
| 8549 | Memory disabled.CPU0_DIMM_D1 | Remove the disabled DIMM. | Major |
| 854A | Memory disabled.CPU0_DIMM_D2 | Remove the disabled DIMM. | Major |
| 854B | Memory disabled.CPU0_DIMM_D3 | Remove the disabled DIMM. | Major |
| 854C | Memory disabled.CPU0_DIMM_E1 | Remove the disabled DIMM. | Major |
| 854D | Memory disabled.CPU0_DIMM_E2 | Remove the disabled DIMM. | Major |
| 854E | Memory disabled.CPU0_DIMM_E3 | Remove the disabled DIMM. | Major |
| 854F | Memory disabled.CPU0_DIMM_F1 | Remove the disabled DIMM. | Major |
| 8550 | Memory disabled.CPU0_DIMM_F2 | Remove the disabled DIMM. | Major |

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| Error Code | Error Message | Action message | Type |
|----------------------|---|---------------------------|-------|
| 8551 | Memory disabled.CPU0_DIMM_F3 | Remove the disabled DIMM. | Major |
| 8552 | Memory disabled.CPU0_DIMM_G1 | Remove the disabled DIMM. | Major |
| 8553 | Memory disabled.CPU0_DIMM_G2 | Remove the disabled DIMM. | Major |
| 8554 | Memory disabled.CPU0_DIMM_G3 | Remove the disabled DIMM. | Major |
| 8555 | Memory disabled.CPU0_DIMM_H1 | Remove the disabled DIMM. | Major |
| 8556 | Memory disabled.CPU0_DIMM_H2 | Remove the disabled DIMM. | Major |
| 8557 | Memory disabled.CPU0_DIMM_H3 | Remove the disabled DIMM. | Major |
| 8558 | Memory disabled.CPU1_DIMM_A1 | Remove the disabled DIMM. | Major |
| 8559 | Memory disabled.CPU1_DIMM_A2 | Remove the disabled DIMM. | Major |
| 855A | Memory disabled.CPU1_DIMM_A3 | Remove the disabled DIMM. | Major |
| 855B | Memory disabled.CPU1_DIMM_B1 | Remove the disabled DIMM. | Major |
| 855C | Memory disabled.CPU1_DIMM_B2 | Remove the disabled DIMM. | Major |
| 855D | Memory disabled.CPU1_DIMM_B3 | Remove the disabled DIMM. | Major |
| 855E | Memory disabled.CPU1_DIMM_C1 | Remove the disabled DIMM. | Major |
| 855F (Go to 85D0) | Memory disabled.CPU1_DIMM_C2 | Remove the disabled DIMM. | Major |
| 8560 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_A1 | | Major |
| 8561 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_A2 | | Major |
| 8562 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_A3 | | Major |
| 8563 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_B1 | | Major |
| 8564 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_B2 | | Major |
| 8565 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_B3 | | Major |
| 8566 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_C1 | | Major |
| 8567 | Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_C2 | | Major |
| 8568 | Memory encountered a Serial Presence Detection (SPD) failure.CPU0_DIMM_C3 | | Major |
| 8569 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_D1 | | Major |
| 856A | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_D2 | | Major |
| 856B | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_D3 | | Major |
| 856C | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_E1 | | Major |
| 856D | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_E2 | | Major |
| 856E | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_E3 | | Major |
| 856F | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_F1 | | Major |
| 8570 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_F2 | | Major |

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| Error Code | Error Message | Action message | Type |
|----------------------|--|---------------------------|-------|
| 8571 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_F3 | | Major |
| 8572 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_G1 | | Major |
| 8573 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_G2 | | Major |
| 8574 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_G3 | | Major |
| 8575 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_H1 | | Major |
| 8576 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_H2 | | Major |
| 8577 | Memory encountered a Serial Presence Detection(SPD) failure.CPU0_DIMM_H3 | | Major |
| 8578 | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_A1 | | Major |
| 8579 | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_A2 | | Major |
| 857A | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_A3 | | Major |
| 857B | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_B1 | | Major |
| 857C | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_B2 | | Major |
| 857D | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_B3 | | Major |
| 857E | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_C1 | | Major |
| 857F (Go to 85E0) | Memory encountered a Serial Presence Detection(SPD) failure.CPU1_DIMM_C2 | | Major |
| 85C0 | Memory failed test/initialization CPU1_DIMM_C3 | Remove the disabled DIMM. | Major |
| 85C1 | Memory failed test/initialization CPU1_DIMM_D1 | Remove the disabled DIMM. | Major |
| 85C2 | Memory failed test/initialization CPU1_DIMM_D2 | Remove the disabled DIMM. | Major |
| 85C3 | Memory failed test/initialization CPU1_DIMM_D3 | Remove the disabled DIMM. | Major |
| 85C4 | Memory failed test/initialization CPU1_DIMM_E1 | Remove the disabled DIMM. | Major |
| 85C5 | Memory failed test/initialization CPU1_DIMM_E2 | Remove the disabled DIMM. | Major |
| 85C6 | Memory failed test/initialization CPU1_DIMM_E3 | Remove the disabled DIMM. | Major |
| 85C7 | Memory failed test/initialization CPU1_DIMM_F1 | Remove the disabled DIMM. | Major |
| 85C8 | Memory failed test/initialization CPU1_DIMM_F2 | Remove the disabled DIMM. | Major |
| 85C9 | Memory failed test/initialization CPU1_DIMM_F3 | Remove the disabled DIMM. | Major |
| 85CA | Memory failed test/initialization CPU1_DIMM_G1 | Remove the disabled DIMM. | Major |
| 85CB | Memory failed test/initialization CPU1_DIMM_G2 | Remove the disabled DIMM. | Major |
| 85CC | Memory failed test/initialization CPU1_DIMM_G3 | Remove the disabled DIMM. | Major |
| 85CD | Memory failed test/initialization CPU1_DIMM_H1 | Remove the disabled DIMM. | Major |
| 85CE | Memory failed test/initialization CPU1_DIMM_H2 | Remove the disabled DIMM. | Major |
| 85CF | Memory failed test/initialization CPU1_DIMM_H3 | Remove the disabled DIMM. | Major |
| 85D0 | Memory disabled.CPU1_DIMM_C3 | Remove the disabled DIMM. | Major |
| 85D1 | Memory disabled.CPU1_DIMM_D1 | Remove the disabled DIMM. | Major |
| 85D2 | Memory disabled.CPU1_DIMM_D2 | Remove the disabled DIMM. | Major |
| 85D3 | Memory disabled.CPU1_DIMM_D3 | Remove the disabled DIMM. | Major |

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| Error Code | Error Message | Action message | Type |
|------------|--|---------------------------|-------|
| 85D4 | Memory disabled.CPU1_DIMM_E1 | Remove the disabled DIMM. | Major |
| 85D5 | Memory disabled.CPU1_DIMM_E2 | Remove the disabled DIMM. | Major |
| 85D6 | Memory disabled.CPU1_DIMM_E3 | Remove the disabled DIMM. | Major |
| 85D7 | Memory disabled.CPU1_DIMM_F1 | Remove the disabled DIMM. | Major |
| 85D8 | Memory disabled.CPU1_DIMM_F2 | Remove the disabled DIMM. | Major |
| 85D9 | Memory disabled.CPU1_DIMM_F3 | Remove the disabled DIMM. | Major |
| 85DA | Memory disabled.CPU1_DIMM_G1 | Remove the disabled DIMM. | Major |
| 85DB | Memory disabled.CPU1_DIMM_G2 | Remove the disabled DIMM. | Major |
| 85DC | Memory disabled.CPU1_DIMM_G3 | Remove the disabled DIMM. | Major |
| 85DD | Memory disabled.CPU1_DIMM_H1 | Remove the disabled DIMM. | Major |
| 85DE | Memory disabled.CPU1_DIMM_H2 | Remove the disabled DIMM. | Major |
| 85DF | Memory disabled.CPU1_DIMM_H3 | Remove the disabled DIMM. | Major |
| 85E0 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_C3 | | Major |
| 85E1 | Memory encountered a Serial Presence Detection (SPD) failure. CPU1_DIMM_D1 | | Major |
| 85E2 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_D2 | | Major |
| 85E3 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_D3 | | Major |
| 85E4 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_E1 | | Major |
| 85E5 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_E2 | | Major |
| 85E6 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_E3 | | Major |
| 85E7 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_F1 | | Major |
| 85E8 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_F2 | | Major |
| 85E9 | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_F3 | | Major |
| 85EA | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_G1 | | Major |
| 85EB | Memory encountered a Serial Presence Detection (SPD) failure. CPU1_DIMM_G2 | | Major |
| 85EC | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_G3 | | Major |
| 85ED | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_H1 | | Major |
| 85EE | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_H2 | | Major |
| 85EF | Memory encountered a Serial Presence Detection (SPD) failure.CPU1_DIMM_H3 | | Major |
| 8604 | POST Reclaim of non-critical NVRAM variables | | Minor |
| 8605 | BIOS Settings are corrupted | | Major |
| 8606 | NVRAM variable space was corrupted and has been reinitialized | | Major |

| Error Code | Error Message | Action message | Type |
|------------|--|--|-------|
| 8607 | Recovery boot has been initiated. Note: The Primary BIOS image may be corrupted or the system may hang during POST. A BIOS update is required. | | Fatal |
| A100 | BIOS ACM Error | | Major |
| A421 | PCI component encountered a SERR error | | Fatal |
| A5A0 | PCI Express component encountered a PERR error | | Minor |
| A5A1 | PCI Express component encountered an SERR error | | Fatal |
| A6A0 | DXE Boot Services driver: Not enough memory available to shadow a Legacy Option ROM. | Disable OpRom at SETUP to save runtime memory. | Minor |

F.1 Processor Initialization Error Summary

Table 14 describes mixed processor conditions and actions for all Intel® server boards and Intel® server systems designed with the Intel® Xeon® Scalable processor family architecture. The errors fall into one of the following categories:

- **Fatal:** If the system cannot boot, POST halts the system and displays the following message:

```
Unrecoverable fatal error found. System will not boot until the error is
resolved
Press <F2> to enter setup
```

When the **<F2>** key on the keyboard is pressed, the BIOS Setup error message is displayed on the BIOS Setup Error Manager screen. An error is logged to the system event log (SEL) with the POST error code.

The “POST Error Pause” option setting in the BIOS Setup does not affect this error.

The system status LED is set to a steady amber color for all fatal errors that are detected during processor initialization. A steady amber system status LED indicates that an unrecoverable system failure condition has occurred.

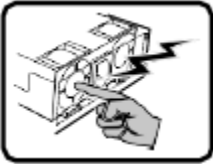
- **Major:** An error message is displayed to the BIOS Setup Error Message screen and an error is logged to the SEL. If the BIOS Setup option “Post Error Pause” is enabled, operator intervention is required to continue booting the system. If the BIOS Setup option “POST Error Pause” is disabled, the system continues to boot.
- **Minor:** An error message may be displayed to the screen or to the BIOS Setup Error Manager and the POST error code is logged to the SEL. The system continues booting in a degraded state. The user may want to replace the erroneous unit. The “POST Error Pause” option setting in the BIOS Setup does not affect this error.

Table 14. Mixed Processor Configurations Error Summary

| Error | Severity | System Action when BIOS Detects the Error Condition |
|--|----------|--|
| Processor family not identical | Fatal | <ul style="list-style-type: none"> Halts at POST code 0xE6. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor model not identical | Fatal | <ul style="list-style-type: none"> Logs the POST error code into the SEL. Alerts the BMC to set the system status LED to steady amber. Displays 0196: Processor model mismatch detected message in the error manager. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor cores/threads not identical | Fatal | <ul style="list-style-type: none"> Halts at POST code 0xE5. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor cache or home agent not identical | Fatal | <ul style="list-style-type: none"> Halts at POST code 0xE5. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor frequency (speed) not identical | Fatal | <p>If the frequencies for all processors can be adjusted to be the same:</p> <ul style="list-style-type: none"> Adjusts all processor frequencies to the highest common frequency. Does not generate an error – this is not an error condition. Continues to boot the system successfully. <p>If the frequencies for all processors cannot be adjusted to be the same:</p> <ul style="list-style-type: none"> Logs the POST error code into the SEL. Alerts the BMC to set the system status LED to steady amber. Does not disable the processor. Displays 0197: Processor speeds unable to synchronize message in the error manager. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor Intel® UPI link frequencies not identical | Fatal | <p>If the link frequencies for all Intel® Ultra Path Interconnect (Intel® UPI) links can be adjusted to be the same:</p> <ul style="list-style-type: none"> Adjusts all Intel® UPI interconnect link frequencies to highest common frequency. Does not generate an error – this is not an error condition. Continues to boot the system successfully. <p>If the link frequencies for all Intel® UPI links cannot be adjusted to be the same:</p> <ul style="list-style-type: none"> Logs the POST error code into the SEL. Alerts the BMC to set the system status LED to steady amber. Does not disable the processor. Displays 0195: Processor Intel(R) UPI link frequencies unable to synchronize message in the error manager. Takes fatal error action (see above) and does not boot until the fault condition is remedied. |
| Processor microcode update failed | Major | <ul style="list-style-type: none"> Logs the POST error code into the SEL. Displays 816x: Processor 0x unable to apply microcode update message in the error manager or on the screen. Takes major error action. The system may continue to boot in a degraded state, depending on the “POST Error Pause” setting in setup, or may halt with the POST error code in the error manager waiting for operator intervention. |
| Processor microcode update missing | Minor | <ul style="list-style-type: none"> Logs the POST error code into the SEL. Displays 818x: Processor 0x microcode update not found message in the error manager or on the screen. The system continues to boot in a degraded state, regardless of the “POST Error Pause” setting in setup. |

Appendix G. Product Safety – Multi-Language

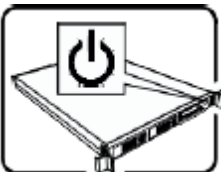
WARNING: English (US)



The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing only to qualified personnel.



Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.



The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply.

The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.



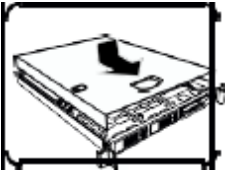
SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by pressing the power button.
3. Unplug all AC power cords from the system or from wall outlets.
4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.
5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.
6. Do not operate the system with the chassis covers removed.



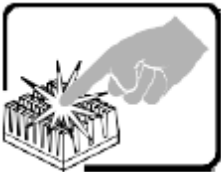
After you have completed the six SAFETY steps above, you can remove the system covers. To do this:

1. Unlock and remove the padlock from the back of the system if a padlock has been installed.
2. Remove and save all screws from the covers.
3. Remove the covers.



For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers:

1. Check first to make sure you have not left loose tools or parts inside the system.
2. Check that cables, add-in boards, and other components are properly installed.
3. Attach the covers to the chassis with the screws removed earlier and tighten them firmly.
4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.
5. Connect all external cables and the AC power cord(s) to the system.



A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.



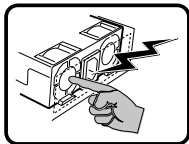
Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.



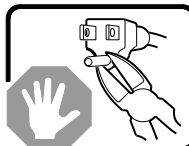
The system is designed to operate in a typical office environment. Choose a site that is:

- Clean and free of airborne particles (other than normal room dust).
- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppresser and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

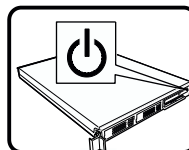
ОСТОРОЖНО: русский



Блок питания данного изделия не содержит деталей, подлежащих обслуживанию пользователем. В этом изделии может быть несколько блоков питания. Обслуживание должно выполняться только квалифицированным персоналом.

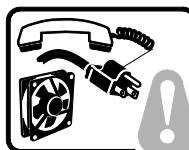


Не модифицируйте и не используйте прилагаемый кабель питания, если он не соответствует требуемому типу. Если в устройстве несколько блоков питания, то к каждому блоку питания прилагается отдельный кабель питания.



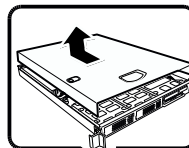
При нажатии кнопки питания не отключается питание системы от электросети. Чтобы отключить подачу питания переменного тока в систему, необходимо отсоединить все кабели питания от электрической розетки или блока питания.

Кабель питания считается размыкателем питания переменного тока. Электрическая розетка, к которой подключается система, должна находиться рядом с оборудованием и быть легко доступной.



ИНСТРУКЦИИ ПО ТЕХНИКЕ БЕЗОПАСНОСТИ. Каждый раз перед снятием крышек корпуса для доступа к внутренней части системы выполняйте следующие действия:

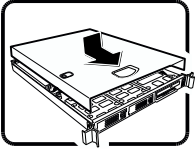
1. Выключите все периферийные устройства, подключенные к системе.
2. Выключите систему, нажав кнопку питания.
3. Отсоедините все кабели питания от системы или электрических розеток.
4. Промаркируйте и отсоедините все кабели, подключенные к разъемам или портам ввода/вывода на задней панели системы.
5. Для обеспечения защиты от электростатического разряда при работе с компонентами надевайте антистатический браслет, прикрепленный к заземленной части корпуса системы (любой неокрашенной металлической поверхности).
6. Запрещается работать с системой, когда крышки корпуса сняты.



Крышки корпуса системы можно снимать, когда выполнены все шесть описанных выше мер безопасности. Для этого:

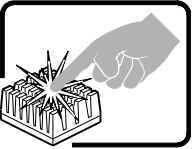
1. Откройте и снимите навесной замок (если имеется) с задней части системы.
2. Выверните все винты с крышек и сохраните их.
3. Снимите крышки.

(продолжение)

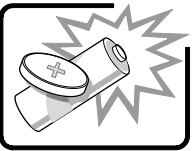
ОСТОРОЖНО: русский (продолжение)

Для обеспечения надлежащего охлаждения и воздушного потока всегда устанавливайте на место крышки корпуса перед включением системы. Работа системы без установленных крышек может привести к повреждению компонентов системы. Чтобы установить крышки, выполните следующие действия:

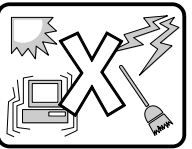
1. Сначала проверьте, не осталось ли в системе незакрепленных инструментов или деталей.
2. Убедитесь, что кабели, платы расширения и другие компоненты установлены правильно.
3. Закрепите крышки на корпусе, завернув и надежно затянув винты, снятые ранее.
4. Установите и закройте навесной замок для предотвращения несанкционированного доступа внутрь системы.
5. Подключите к системе все внешние кабели и кабели питания.



Микропроцессор и теплоотвод могут нагреваться во время работы системы. На некоторых деталях платы и корпуса могут быть острые выступы и кромки. Соблюдайте осторожность. Рекомендуется использовать защитные перчатки.



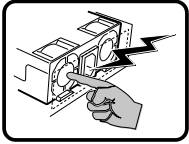
В случае неправильной замены аккумулятора существует опасность взрыва. При замене используйте только те же или эквивалентные модели аккумуляторов, рекомендованные производителем оборудования. Утилизируйте использованные аккумуляторы в соответствии с инструкциями производителя.



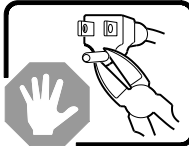
Система предназначена для работы в обычной офисной среде. Место установки системы должно соответствовать следующим требованиям:

- Помещение должно быть чистым, в воздухе не должно быть взвешенных частиц (кроме обычной пыли).
- Место установки должно хорошо вентилироваться и находиться вдали от источников тепла (включая прямой солнечный свет).
- Место установки должно находиться вдали от источников вибрации или механических ударов.
- Место установки должно быть изолировано от сильных электромагнитных полей, создаваемых электрическими устройствами.
- В регионах, где часто бывает гроза, рекомендуется подключать систему к сетевому фильтру и отключать телекоммуникационные линии от модема во время грозы.
- В помещении должна быть правильно заземленная электрическая розетка.
- Должен быть оставлен достаточный зазор для доступа к кабелям питания, которые служат размыкателем электропитания системы.

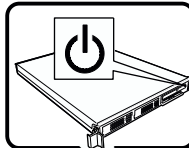
УВАГА! Українська



Джерело живлення в цьому виробі не містить жодних частин, які користувачі могли б обслуговувати самостійно. Цей виріб може містити більше одного джерела живлення. Обслуговувати його може виключно кваліфікований персонал.

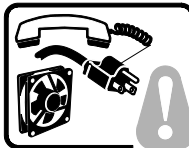


Не намагайтеся модифікувати шнур живлення змінного струму з комплекту або користуватися ним, якщо він не відповідає потрібному типу. Виріб із джерелами живлення більше одного має окремі шнури живлення змінного струму для кожного джерела.



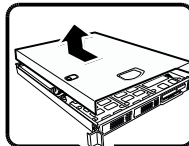
Кнопка живлення на системі не вимикає живлення змінного струму системи. Щоб позбавити систему змінного струму, слід вийняти всі шнури живлення змінного струму зі стінних розеток або джерел живлення.

Вважається, що шнур(и) живлення є пристроями вимкнення основного живлення (змінного струму). Розетка електромережі, до якої підключається система, мусить бути розташована поруч із обладнанням і легкодоступна.



КРОКИ БЕЗПЕКИ: Щоразу, знімаючи корпус для доступу до внутрішніх частин системи, виконуйте ці кроки:

7. Вимкніть усі периферійні пристрої, підключені до системи.
8. Вимкніть систему, натиснувши кнопку живлення.
9. Вийміть шнури живлення змінного струму із системи чи стінних розеток.
10. Позначте і від'єднайте всі кабелі, підключені до з'єднувачів входу/виходу або портів ззаду на системі.
11. Працюючи з компонентами, захищайтеся від електростатичних розрядів (ЕР), вдягаючи антистатичний ремінець-браслет, прикріплений до елемента заземлення корпусу - будь-якої непофарбованої металевої поверхні.
12. Не використовуйте систему з відкритим корпусом.

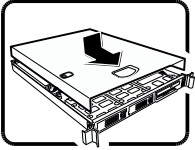


Після виконання шести наведених вище кроків БЕЗПЕКИ можна знімати корпус (кришки) з системи. Для цього виконайте такі дії:

4. Розблокуйте і зніміть замок ззаду на системі, якщо його встановлено.
5. Зніміть і збережіть всі гвинти з кришок.
6. Зніміть усі кришки.

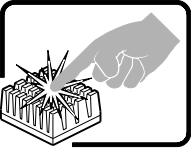
продовження

УВАГА! Українська (продовження)

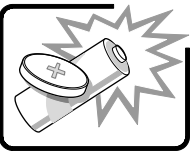


Для правильного охолодження та вентиляції завжди повертайте на місце кришки корпусу перед увімкненням системи. Робота системи без кришок може пошкодити деталі системи. Щоб установити кришки, виконайте такі дії:

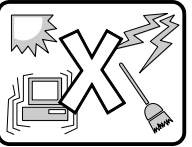
6. Спочатку переконайтеся, що всередині системи не залишилося деталей або незакріплених інструментів.
7. Перевірте, чи правильно встановлено кабелі, розширювальні плати та інші компоненти.
8. Прикріпіть кришки до корпусу знятими раніше гвинтами та надійно їх затягніть.
9. Вставте в систему і зафіксуйте замок, щоб запобігти неавторизованому доступу до нього.
10. Підключіть усі зовнішні кабелі та шнур(и) живлення змінного струму до системи.



Під час роботи системи мікропроцесор і радіатор можуть розігрітися до гарячого. Деякі частини корпусу і плат можуть мати гострі шипи або краї. Із ними слід поводитися обережно. Можна вдягти захисні рукавички.



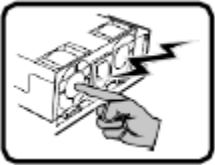
Загроза вибуху, якщо батарею замінено на неправильну. Замінюйте лише таким самим або еквівалентним типом, рекомендованим виробником. Утилізуйте використані батареї згідно з інструкціями виробника.



Систему створено для роботи в типовому офісному приміщенні. Виберіть місце, яке:

- Чисте і де немає в повітрі інших дрібних часточок, окрім звичайного побутового пилу.
- Добре провітрюється, розташоване далеко від джерел тепла, включно з прямим сонячним промінням.
- Розташоване далеко від джерел вібрації і струсів.
- Ізольоване від сильних електромагнітних полів, спричинених електроприладами.
- У регіонах, де часто проходять грози, радимо підключати пристрій через пристрій захисту від викидів напруги та відключити телекомунікаційні лінії від модему під час грози.
- Оснащене правильно заземленими стінними розетками електромережі.
- Має достатньо простору для доступу до шнура(ів) живлення, оскільки вони слугують основними вимикачами виробу.

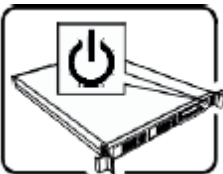
AVERTISSEMENT: Français



Le bloc d'alimentation de ce produit ne contient aucune pièce pouvant être réparée par l'utilisateur. Ce produit peut contenir plus d'un bloc d'alimentation. Veuillez contacter un technicien qualifié en cas de problème.



Ne pas essayer d'utiliser ni modifier le câble d'alimentation CA fourni, s'il ne correspond pas exactement au type requis. Le nombre de câbles d'alimentation CA fournis correspond au nombre de blocs d'alimentation du produit.

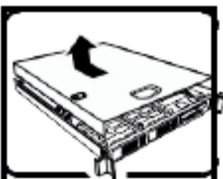


Notez que le commutateur CC de mise sous tension /hors tension du panneau avant n'éteint pas l'alimentation CA du système. Pour mettre le système hors tension, vous devez débrancher chaque câble d'alimentation de sa prise.



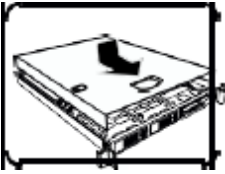
CONSIGNES DE SÉCURITÉ: Lorsque vous ouvrez le boîtier pour accéder à l'intérieur du système, suivez les consignes suivantes:

1. Mettez hors tension tous les périphériques connectés au système.
2. Mettez le système hors tension en mettant l'interrupteur général en position OFF (bouton-poussoir).
3. Débranchez tous les cordons d'alimentation c.a. du système et des prises murales.
4. Identifiez et débranchez tous les câbles reliés aux connecteurs d'E-S ou aux accès derrière le système.
5. Pour prévenir les décharges électrostatiques lorsque vous touchez aux composants, portez une bande antistatique pour poignet et reliez-la à la masse du système (toute surface métallique non peinte du boîtier).
6. Ne faites pas fonctionner le système tandis que le boîtier est ouvert.



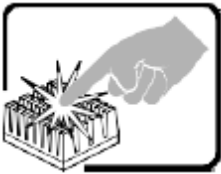
Une fois TOUTES les étapes précédentes accomplies, vous pouvez retirer les panneaux du système. Procédez comme suit:

1. Si un cadenas a été installé sur à l'arrière du système, déverrouillez-le et retirez-le.
2. Retirez toutes les vis des panneaux et mettez-les dans un endroit sûr.
3. Retirez les panneaux.



Afin de permettre le refroidissement et l'aération du système, réinstallez toujours les panneaux du boîtier avant de mettre le système sous tension. Le fonctionnement du système en l'absence des panneaux risque d'endommager ses pièces. Pour installer les panneaux, procédez comme suit:

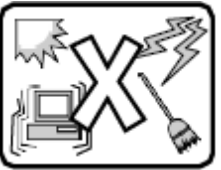
1. Assurez-vous de ne pas avoir oublié d'outils ou de pièces démontées dans le système.
2. Assurez-vous que les câbles, les cartes d'extension et les autres composants sont bien installés.
3. Revissez solidement les panneaux du boîtier avec les vis retirées plus tôt.
4. Remettez le cadenas en place et verrouillez-le afin de prévenir tout accès non autorisé à l'intérieur du système.
5. Rebranchez tous les cordons d'alimentation c. a. et câbles externes au système.



Le microprocesseur et le dissipateur de chaleur peuvent être chauds si le système a été sous tension. Faites également attention aux broches aiguës des cartes et aux bords tranchants du capot. Nous vous recommandons l'usage de gants de protection.



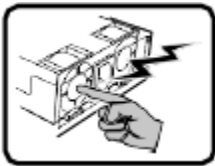
Danger d'explosion si la batterie n'est pas remontée correctement. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le fabricant. Disposez des piles usées selon les instructions du fabricant.



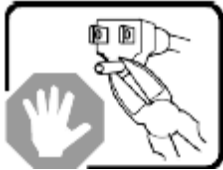
Le système a été conçu pour fonctionner dans un cadre de travail normal. L'emplacement choisi doit être:

- Propre et dépourvu de poussière en suspension (sauf la poussière normale).
- Bien aéré et loin des sources de chaleur, y compris du soleil direct.
- A l'abri des chocs et des sources de vibrations.
- Isolé de forts champs électromagnétiques générés par des appareils électriques.
- Dans les régions sujettes aux orages magnétiques il est recommandé de brancher votre système à un suppresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage.
- Muni d'une prise murale correctement mise à la terre.
- Suffisamment spacieux pour vous permettre d'accéder aux câbles d'alimentation (ceux-ci étant le seul moyen de mettre le système hors tension).

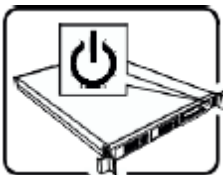
WARNUNG: Deutsch



Benutzer können am Netzgerät dieses Produkts keine Reparaturen vornehmen. Das Produkt enthält möglicherweise mehrere Netzgeräte. Wartungsarbeiten müssen von qualifizierten Technikern ausgeführt werden.



Versuchen Sie nicht, das mitgelieferte Netzkabel zu ändern oder zu verwenden, wenn es sich nicht genau um den erforderlichen Typ handelt. Ein Produkt mit mehreren Netzgeräten hat für jedes Netzgerät ein eigenes Netzkabel.



Der Wechselstrom des Systems wird durch den Ein-/Aus-Schalter für Gleichstrom nicht ausgeschaltet. Ziehen Sie jedes Wechselstrom-Netzkabel aus der Steckdose bzw. dem Netzgerät, um den Stromanschluß des Systems zu unterbrechen.



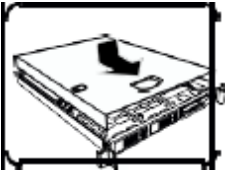
SICHERHEISSCHRIFFEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten:

1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus.
2. Schalten Sie das System mit dem Hauptschalter aus.
3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose.
4. Auf der Rückseite des Systems beschriften und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab.
5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden.
6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.



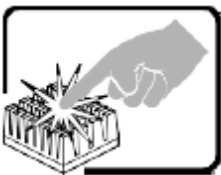
Nachdem Sie die oben erwähnten ersten sechs SICHERHEITSSCHRITTE durchgeführt haben, können Sie die Abdeckung abnehmen, indem Sie:

1. Öffnen und entfernen Sie die Verschlusseinrichtung (Padlock) auf der Rückseite des Systems, falls eine Verschlusseinrichtung installiert ist.
2. Entfernen Sie alle Schrauben der Gehäuseabdeckung.
3. Nehmen Sie die Abdeckung ab.

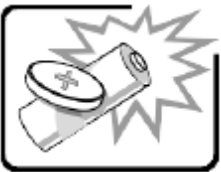


Zur ordnungsgemäßen Kühlung und Lüftung muß die Gehäuseabdeckung immer wieder vor dem Einschalten installiert werden. Ein Betrieb des Systems ohne angebrachte Abdeckung kann Ihrem System oder Teile darin beschädigen. Um die Abdeckung wieder anzubringen:

1. Vergewissern Sie sich, daß Sie keine Werkzeuge oder Teile im Innern des Systems zurückgelassen haben.
2. Überprüfen Sie alle Kabel, Zusatzkarten und andere Komponenten auf ordnungsgemäßen Sitz und Installation.
3. Bringen Sie die Abdeckungen wieder am Gehäuse an, indem Sie die zuvor gelösten Schrauben wieder anbringen. Ziehen Sie diese gut an.
4. Bringen Sie die Verschlusseinrichtung (Padlock) wieder an und schließen Sie diese, um ein unerlaubtes Öffnen des Systems zu verhindern.
5. Schließen Sie alle externen Kabel und den AC Stromanschlußstecker Ihres Systems wieder an.



Der Mikroprozessor und der Kühler sind möglicherweise erhitzt, wenn das System in Betrieb ist. Außerdem können einige Platinen und Gehäuseteile scharfe Spitzen und Kanten aufweisen. Arbeiten an Platinen und Gehäuse sollten vorsichtig ausgeführt werden. Sie sollten Schutzhandschuhe tragen.



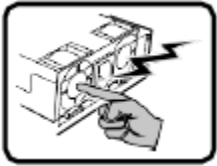
Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.



Das System wurde für den Betrieb in einer normalen Büroumgebung entwickelt. Der Standort sollte:

- sauber und staubfrei sein (Hausstaub ausgenommen);
- gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung);
- keinen Erschütterungen ausgesetzt sein;
- keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen;
- in Regionen, in denen elektrische Stürme auftreten, mit einem Überspannungsschutzgerät verbunden sein; während eines elektrischen Sturms sollte keine Verbindung der Telekommunikationsleitungen mit dem Modem bestehen;
- mit einer geerdeten Wechselstromsteckdose ausgerüstet sein;
- über ausreichend Platz verfügen, um Zugang zu den Netzkabeln zu gewährleisten, da der Stromanschluß des Produkts hauptsächlich über die Kabel unterbrochen wird.

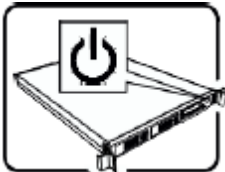
AVVERTENZA: Italiano



Rivolgersi ad un tecnico specializzato per la riparazione dei componenti dell'alimentazione di questo prodotto. È possibile che il prodotto disponga di più fonti di alimentazione.



Non modificare o utilizzare il cavo di alimentazione in c.a. fornito dal produttore, se non corrisponde esattamente al tipo richiesto. Ad ogni fonte di alimentazione corrisponde un cavo di alimentazione in c.a. separato.



L'interruttore attivato/disattivato nel pannello anteriore non interrompe l'alimentazione in c.a. del sistema. Per interromperla, è necessario scollegare tutti i cavi di alimentazione in c.a. dalle prese a muro o dall'alimentazione di corrente.



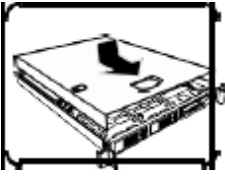
PASSI DI SICUREZZA: Qualora si rimuovano le coperture del telaio per accedere all'interno del sistema, seguire i seguenti passi:

1. Spegnerne tutti i dispositivi periferici collegati al sistema.
2. Spegnerne il sistema, usando il pulsante spento/acceso dell'interruttore del sistema.
3. Togliere tutte le spine dei cavi del sistema dalle prese elettriche.
4. Identificare e sconnettere tutti i cavi attaccati ai collegamenti I/O od alle prese installate sul retro del sistema.
5. Qualora si tocchino i componenti, proteggersi dallo scarico elettrostatico (SES), portando un cinghia anti-statica da polso che è attaccata alla presa a terra del telaio del sistema – qualsiasi superficie non dipinta – .
6. Non far operare il sistema quando il telaio è senza le coperture.



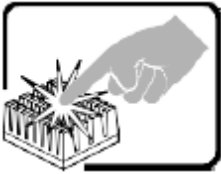
Dopo aver seguito i sei passi di SICUREZZA sopracitati, togliere le coperture del telaio del sistema come segue:

1. Aprire e rimuovere il lucchetto dal retro del sistema qualora ve ne fosse uno installato.
2. Togliere e mettere in un posto sicuro tutte le viti delle coperture.
3. Togliere le coperture.



Per il giusto flusso dell'aria e raffreddamento del sistema, rimettere sempre le coperture del telaio prima di riaccendere il sistema. Operare il sistema senza le coperture al loro proprio posto potrebbe danneggiare i componenti del sistema. Per rimettere le coperture del telaio:

1. Controllare prima che non si siano lasciati degli attrezzi o dei componenti dentro il sistema.
2. Controllare che i cavi, dei supporti aggiuntivi ed altri componenti siano stati installati appropriatamente.
3. Attaccare le coperture al telaio con le viti tolte in precedenza e avvitarle strettamente.
4. Inserire e chiudere a chiave il lucchetto sul retro del sistema per impedire l'accesso non autorizzato al sistema.
5. Ricollegare tutti i cavi esterni e le prolunghe AC del sistema.



Se il sistema è stato a lungo in funzione, il microprocessore e il dissipatore di calore potrebbero essere surriscaldati. Fare attenzione alla presenza di piedini appuntiti e parti taglienti sulle schede e sul telaio. È consigliabile l'uso di guanti di protezione.



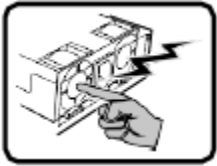
Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.



Il sistema è progettato per funzionare in un ambiente di lavoro tipo. Scegliere una postazione che sia:

- Pulita e libera da particelle in sospensione (a parte la normale polvere presente nell'ambiente).
- Ben ventilata e lontana da fonti di calore, compresa la luce solare diretta.
- Al riparo da urti e lontana da fonti di vibrazione.
- Isolata dai forti campi magnetici prodotti da dispositivi elettrici.
- In aree soggette a temporali, è consigliabile collegare il sistema ad un limitatore di corrente. In caso di temporali, scollegare le linee di comunicazione dal modem.
- Dotata di una presa a muro correttamente installata.
- Dotata di spazio sufficiente ad accedere ai cavi di alimentazione, i quali rappresentano il mezzo principale di scollegamento del sistema.

ADVERTENCIAS: Español

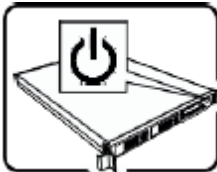


El usuario debe abstenerse de manipular los componentes de la fuente de alimentación de este producto, cuya reparación debe dejarse exclusivamente en manos de personal técnico especializado. Puede que este producto disponga de más de una fuente de alimentación.



No intente modificar ni usar el cable de alimentación de corriente alterna, si no corresponde exactamente con el tipo requerido.

El número de cables suministrados se corresponden con el número de fuentes de alimentación de corriente alterna que tenga el producto.

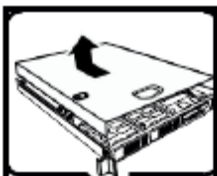


Nótese que el interruptor activado/desactivado en el panel frontal no desconecta la corriente alterna del sistema. Para desconectarla, deberá desenchufar todos los cables de corriente alterna de la pared o desconectar la fuente de alimentación.



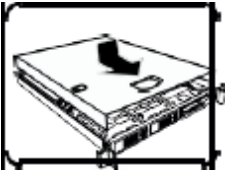
INSTRUCCIONES DE SEGURIDAD: Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones:

1. Apague todos los dispositivos periféricos conectados al sistema.
2. Apague el sistema presionando el interruptor encendido/apagado.
3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna.
4. Identifique y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema.
5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujeta a la toma de tierra del chasis — o a cualquier tipo de superficie de metal sin pintar.
6. No ponga en marcha el sistema si se han extraído las tapas del chasis.



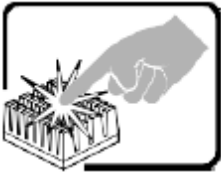
Después de completar las seis instrucciones de SEGURIDAD mencionadas, ya puede extraer las tapas del sistema. Para ello:

1. Desbloquee y extraiga el bloqueo de seguridad de la parte posterior del sistema, si se ha instalado uno.
2. Extraiga y guarde todos los tornillos de las tapas.
3. Extraiga las tapas.



Para obtener un enfriamiento y un flujo de aire adecuados, reinstale siempre las tapas del chasis antes de poner en marcha el sistema. Si pone en funcionamiento el sistema sin las tapas bien colocadas puede dañar los componentes del sistema. Para instalar las tapas:

1. Asegúrese primero de no haber dejado herramientas o componentes sueltos dentro del sistema.
2. Compruebe que los cables, las placas adicionales y otros componentes se hayan instalado correctamente.
3. Incorpore las tapas al chasis mediante los tornillos extraídos anteriormente, tensándolos firmemente.
4. Inserte el bloqueo de seguridad en el sistema y bloquéelo para impedir que pueda accederse al mismo sin autorización.
5. Conecte todos los cables externos y los cables de alimentación CA al sistema.



Si el sistema ha estado en funcionamiento, el microprocesador y el disipador de calor pueden estar aún calientes. También conviene tener en cuenta que en el chasis o en el tablero puede haber piezas cortantes o punzantes. Por ello, se recomienda precaución y el uso de guantes protectores.



Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.

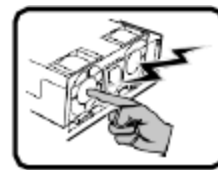


El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar:

- Limpio y libre de partículas en suspensión (salvo el polvo normal).
- Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa.
- Alejado de fuentes de vibración.
- Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos.
- En regiones con frecuentes tormentas eléctricas, se recomienda conectar su sistema a un eliminador de sobrevoltage y desconectar el módem de las líneas de telecomunicación durante las tormentas.
- Provisto de una toma de tierra correctamente instalada.
- Provisto de espacio suficiente como para acceder a los cables de alimentación, ya que éstos hacen de medio principal de desconexión del sistema.

אזהרה: עברית

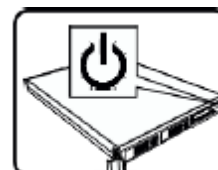
אספקת החשמל במוצר זה לא מכילה חלקים שניתנים לשירות על ידי משתמש. ייתכן שיש יותר ממקור אספקת חשמל אחד במוצר זה. לקבלת שירות יש לפנות רק אל אנשים המוסמכים לכך.



אין לנסות לשנות את כבל החשמל ז"ח המסופק, או לשנותו, אם הוא לא מהסוג המדויק הנדרש. למוצר עם יותר ממקור אספקת חשמל אחד יצורף כבל חשמל נפרד לכל מקור אספקת חשמל.



מתג ההפעלה במערכת לא מכבה את מערכת חשמל ז"ח. להסרת חשמל ז"ח מהמערכת, יש לנתק כל כבל חשמל ז"ח משקע הקיר או מאספקת החשמל.



כבל(ים) החשמל נחשב(ים) להתקן(ני) ניתוק מקור אספקת חשמל ז"ח. שקע הקיר שאליו מחוברת המערכת יותקן בסמוך לציוד ויהיה נגיש בקלות.

שלבי בטיחות: בכל פעם שמסירים את מכסי המעטפת כדי לגשת לחלק הפנימי של המערכת, יש לבצע את הצעדים הבאים:

1. לכבות את כל ההתקנים ההיקפיים שמחוברים למערכת.
2. לכבות את המערכת על ידי לחיצה על מתג ההפעלה.
3. לנתק את כל כבלי חשמל ז"ח מהמערכת או משקעי הקיר.
4. לתייג את כל הכבלים המחוברים למחברי קלט/פלט או ליציאות בגב המערכת ולנתק אותם.
5. לספק הגנה מסוימת מפריקות אלקטרוסטטיות (ESD) על ידי חבישת רצועת שורש כף יד אנטיסטטית שמחוברת להארקת המעטפת של המערכת - כל משטח מתכת לא צבוע - בעת הטיפול ברכיבים.
6. אין להפעיל את המערכת כשמכסי המעטפת מוסרים.

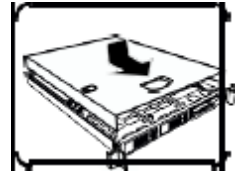


לאחר השלמת ששת שלבי הבטיחות לעיל, באפשרותכם להסיר את מכסי המערכת. כדי לעשות זאת:

1. יש לפתוח את המנעול התלוי ולהסירו מגב המערכת אם אכן הותקן בה מנעול תלוי.
2. יש להסיר את כל הברגים של המכסים ולשמור אותם.
3. יש להסיר את המכסים.

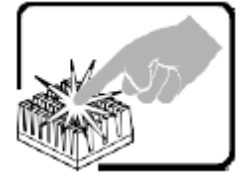


לקירור ולזרימת אוויר תקינים, יש תמיד להתקין מחדש את מכסי המעטפת לפני הפעלת המערכת. הפעלת המערכת ללא המכסים במקומם, עלולה לגרום נזק לחלקי המערכת. להתקנת המכסים:



1. יש לבדוק תחילה כדי לוודא שלא נשארו כלים או חלקים רופפים בתוך המערכת.
2. יש לבדוק שהכבלים, הלוחות הנוספים ורכיבים אחרים מותקנים כראוי.
3. יש לחבר את המכסים למעטפת עם הברגים שהוסרו קודם לכן ולהדק אותם בחוזקה למקומם.
4. יש להכניס את מנעול התליה למערכת ולנעול אותו כדי למנוע גישה בלתי מורשית לפנים המערכת.
5. יש לחבר את כל הכבלים החיצוניים ואת כבל(*) חשמל ז"ח למערכת.

מעבד המיקרו ומפזר החום עלולים להיות לוחטים כשהמערכת פועלת. כמו כן, ייתכנו סיכות וקצוות חדים בחלקי לוח ומעטפת שונים. יש לגעת בזהירות. יש לשקול עטיית כפפות מגן.



סכנת פיצוץ אם הסוללה מוחלפת באופן שגוי. יש להחליף רק באותו סוג או שווה ערך שמומלץ על ידי יצרן הציוד. יש להשליך סוללות משומשות על פי הוראות היצרן.



המערכת נועדה לפעול בסביבה משרדית טיפוסית. יש לבחור אתר שהוא:

- נקי וחופשי מחלקיקים נישאים באוויר (למעט אבק שקיים באופן רגיל בחדר).
- מאוורר היטב ורחוק ממקורות חום כולל אור שמש ישיר.
- יש להרחיק ממקורות רטט או זעזועים פיזיים.
- מבודד משדות אלקטרומגנטיים חזקים שנגרמים על ידי מכשירים חשמליים.
- באזורים שרגישים לסערות חשמל, אנו ממליצים לחבר את המערכת למדכא נחשול, ובמהלך סערה חשמלית לנתק קווי תקשורת שמחוברים למודם שלכם.
- בעל שקע קיר מוארק כהלכה.
- בעל מספיק מקום לגישה חופשית לכבל(*) החשמל, מכיוון שהוא/הם משמש(ים) לניתוק רשת החשמל למוצר.



Appendix H. Glossary

| Term | Definition |
|----------------------|---|
| 1U | One rack unit (1.75 in.) |
| 2U | Two rack units (3.5 in.) |
| BIOS | Basic Input/Output System; non-volatile firmware |
| BMC | Baseboard management controller |
| CDU | Coolant Distribution Unit |
| Chassis | Casing containing the server modules and fans/liquid cooling plumbing |
| DIMM | Dual inline memory module |
| EFI | Extensible Firmware Interface |
| EMP module | Ethernet Management Port module |
| ESD | Electrostatic discharge |
| FRU | Field replacement unit |
| PCH | Platform Controller Hub |
| PHM | Processor heat sink module |
| Memory Module | DDR4 DIMMs and Intel® Optane™ PMem devices are commonly referred to as “memory module”. |
| MRC | Memory Reference Code |
| NVMe* | Non-Volatile Memory Express |
| OOB | Out of Band |
| PCIe* | Peripheral Component Interconnect Express |
| PDB | Power distribution board |
| POST | Power-on self-test |
| PTH | Plated Through Hole |
| Rack | Casing containing one or multiple chassis |
| SDR | Sensor data record |
| SEL | System event log |
| SMT | Surface-Mount Technology |
| SSD | Solid state drive |
| SUP | System update package |
| SVN | Security Version Number |
| TIM | Thermal Interface Material |
| VR | Voltage Regulator |
| Intel® VROC | Intel® Virtual Raid on Chip |