ThinkSystem SC750 V4 Neptune Tray
User Guide

Machine Types: 7DDJ

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at:
https://pubs.lenovo.com/safety_documentation/

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your server, which can be found at:
http://datacentersupport.lenovo.com/warrantylookup

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information （安全信息）。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

.לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте ја информацијата за безбедност.

[illegible]

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się
z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

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བྱ་འདུ་ཤིན་ཡོད་པའི་འོད་སྡེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your server. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury.

Note: The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

Note: The set-up of the server is made in the server room only.

CAUTION:
This equipment must be serviced by trained personnel, as defined by the IEC 62368-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Equipment must be installed in a restricted access location and access to the equipment is controlled by the authority responsible for the location.

Important: Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
2. Check the power cord.
    - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
    - Make sure that the power cord is the correct type.

      To view the power cords that are available for the server:

      a. Go to:

    http://dcsc.lenovo.com/#/

    b. Click **Preconfigured Model** or **Configure to order**.
    c. Enter the machine type and model for your server to display the configurator page.
    d. Click **Power → Power Cables** to see all line cords.
  - Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Chapter 1. ThinkSystem SC750 V4, Types 7DDJ

The ThinkSystem SC750 V4 is designed to deliver a dense, scalable platform for distributed enterprise and hyperconverged solutions.

Notes:

- Up to eight SC750 V4 trays can be installed in an N1380 13U enclosure.
- Each SC750 V4 tray contains two compute nodes, node A and node B. Node A is the bottom node and node B is the top node when viewing the tray from the front of the N1380 enclosure.

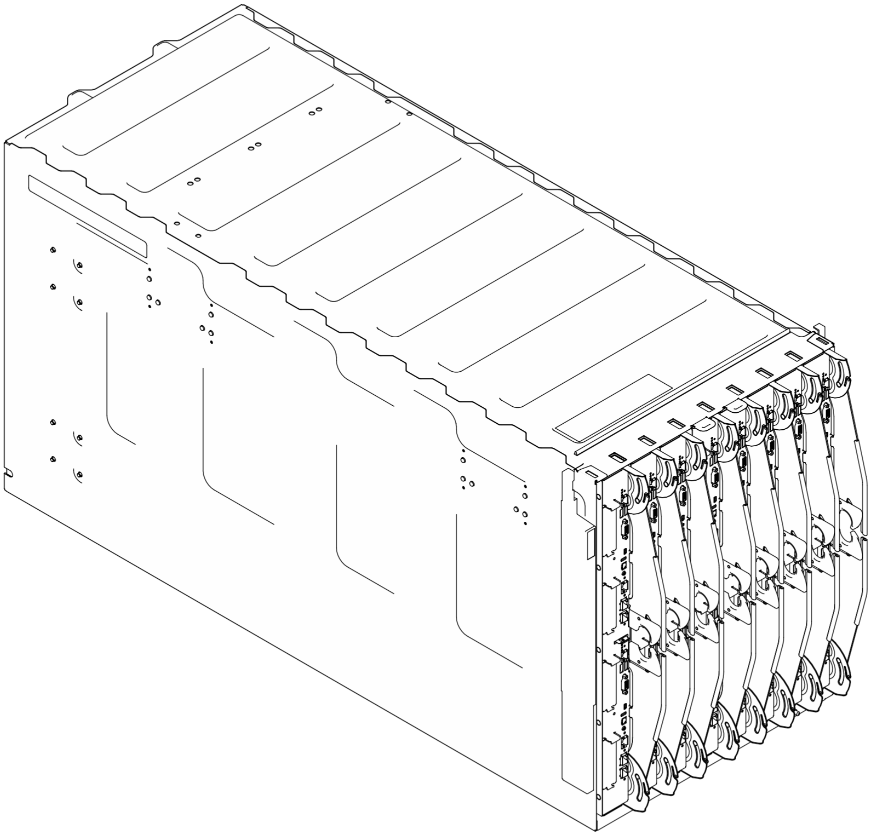


Figure 1. N1380 Enclosure installed with eight SC750 V4 trays

Features

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your solution. These design features make it possible for you to customize the system hardware to meet your needs today and provide flexible expansion capabilities for the future.

Your solution implements the following features and technologies:

- **Features on Demand**

  If a Features on Demand feature is integrated in the solution or in an optional device that is installed in the solution, you can purchase an activation key to activate the feature. For information about Features on Demand, see:

  https://fod.lenovo.com/lkms

- **Lenovo XClarity Controller (XCC)**

  The Lenovo XClarity Controller is the common management controller for Lenovo ThinkSystem server hardware. The Lenovo XClarity Controller consolidates multiple management functions in a single chip on the server system board. Some of the features that are unique to the Lenovo XClarity Controller are enhanced performance, higher-resolution remote video, and expanded security options.

  The server supports Lenovo XClarity Controller 3 (XCC3). For additional information about Lenovo XClarity Controller 3 (XCC3), refer to https://pubs.lenovo.com/lxcc-overview/.

- **UEFI-compliant server firmware**

  Lenovo ThinkSystem firmware is Unified Extensible Firmware Interface (UEFI) compliant. UEFI replaces BIOS and defines a standard interface between the operating system, platform firmware, and external devices.

  Lenovo ThinkSystem solutions are capable of booting UEFI-compliant operating systems and UEFI-compliant adapters.

  Note: The solution does not support Disk Operating System (DOS).

- **Active Memory**

  The Active Memory feature improves the reliability of memory through memory mirroring. Memory mirroring mode replicates and stores data on two pairs of DIMMs within two channels simultaneously. If a failure occurs, the memory controller switches from the primary pair of memory DIMMs to the backup pair of DIMMs.

- **Large system-memory capacity**

  The solution supports synchronous dynamic random-access memory (SDRAM) registered dual inline memory modules (DIMMs) with error correcting code (ECC). For more information about the specific types and maximum amount of memory, see "Technical specifications" on page 4.

- **Integrated network support**
  - One Gigabit Ethernet port with RJ45 connector (Dedicated XCC management connector)
  - One Gigabit Ethernet port with RJ45 connector, shared between operating system and Lenovo XClarity Controller.
  - Two 25Gb SFP 28 ports. One port is shared between operating system and Lenovo XClarity Controller.

    Note: Lenovo XClarity Controller connection is mutually exclusive between RJ45 Ethernet connector and 25Gb SFP28 Port 1.

- **Large data-storage capacity**

  Each node supports the following drives:

  - Up to four E3.S 1T NVMe SSD at the front of the server (location shared with PCIe adapters)
  - Up to two E3.S 2T NVMe SSD at the front of the server (location shared with PCIe adapters)
  - Up to two E3.S 1T NVMe SSD on top of processor cold plate on the water loop.

- **Lightpath Diagnostics**

  Lightpath Diagnostics provides LEDs to help you diagnose problems. For more information about the Lightpath Diagnostics, see "Troubleshooting by system LEDs and diagnostics display" on page 439.

- **Mobile access to Lenovo Service Information website**

  The solution provides a QR code on the system service label, which is on the inside of the tray cover, that you can scan using a QR code reader and scanner with a mobile device to get quick access to the Lenovo Service Information website. The Lenovo Service Information website provides additional information for parts installation, replacement videos, and error codes for solution support.

- **Active Energy Manager**

Lenovo XClarity Energy Manager is a power and temperature management solution for data centers. You can monitor and manage the power consumption and temperature of Converged, NeXtScale, System x, and ThinkServer solutions, and improve energy efficiency using Lenovo XClarity Energy Manager.

- **Optional power capabilities**

  Depending on the system configurations, the solution requires up to four 15000W DWC Power Conversion Stations (PCS) installed in the enclosure.

  Note: Do not mix Power Conversion Stations in the same unit of solution.

- **ThinkSystem RAID support**

  The solution supports:
  - Intel VROC standard
  - Intel VROC Premium
  - Intel VROC Boot

Tech Tips

Lenovo continually updates the support website with the latest tips and techniques that you can use to solve issues that your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

To find the Tech Tips available for your server:

1. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server.
2. Click on **How To's** from the navigation pane.
3. Click **Article Type** → **Solution** from the drop-down menu.

   Follow the on-screen instructions to choose the category for the problem that you are having.

Security advisories

Lenovo is committed to developing products and services that adhere to the highest security standards in order to protect our customers and their data. When potential vulnerabilities are reported, it is the responsibility of the Lenovo Product Security Incident Response Team (PSIRT) to investigate and provide information to our customers so they may put mitigation plans in place as we work toward providing solutions.

The list of current advisories is available at the following site:

https://datacentersupport.lenovo.com/product_security/home

Specifications

Summary of the features and specifications of the solution. Depending on the model, some features might not be available, or some specifications might not apply.

Notes:
- Up to eight SC750 V4 trays can be installed in an N1380 13U enclosure.
- Each SC750 V4 tray contains two compute nodes, node A and node B. Node A is the bottom node and node B is the top node when viewing the tray from the front of the N1380 enclosure.

Refer to the below table for specifications categories and the content of each category.

Specification category	Technical specifications	Mechanical specifications	Environmental specifications
Content	• Processor • Memory • Storage expansion • Graphics processing units (GPU) • Integrated functions and I/O connectors • Network • Electrical input • Minimal configuration for debugging • Operating systems	• Dimension • Weight	• Acoustical noise emissions • Environment • Water requirements

Technical specifications

Summary of the technical specifications of solution. Depending on the model, some features might not be available, or some specifications might not apply.

Notes:
- Up to eight SC750 V4 trays can be installed in an N1380 13U enclosure.
- Each SC750 V4 tray contains two compute nodes, node A and node B. Node A is the bottom node and node B is the top node when viewing the tray from the front of the N1380 enclosure.
- Access one set of monitor (VGA port) and keyboard/mouse (USB port) peripheral per N1380 enclosure at a time is recommended per radiated emission compliance.

Processor
• Supports two processors per node. • Supported CPU is 6th Gen Intel® Xeon® Scalable processors (codenamed Granite Rapid-AP) – Support up to 128 cores, base speeds up to 3.9 GHz, and TDP ratings up to 500W. – Twelve channels per processor – UPI 2.0 – Six UPI per processor – x24 UPI link width with speed of 16, 20, and 24 GT/s. – New Socket Technology (Socket BR with PCIe 5.0) LGA 7529. **Notes:** 1. Use the Setup Utility to determine the type and speed of the processors in the node. 2. For a list of supported processors, see https://serverproven.lenovo.com.

Memory

See “Memory module installation rules and order” on page 36 for detailed information about memory configuration and setup.

- Slots:
  - 24 DIMM slots per node, 12 DIMMs per processor. SC750 V4 only supports fully populated DIMM configuration.
- Memory type and capacity:
  - 6th Gen Intel® Xeon® Scalable processors (codenamed Granite Rapid-AP)
    - Capacity:
      - 24Gb based DDR5 RDIMM: 48GB and 96 GB at 6400 MT/s
      - 32Gb based DDR5 RDIMM: 32GB, 64GB, and 128GB at 6400 MT/s
      - MRDIMM: 32GB and 64 GB at 8800 MT/s
    - Minimum capacity per node: 768 GB per node with twenty-four 32 GB RDIMMs
    - Maximum capacity per node: up to 3 TB memory with twenty-four 128 GB RDIMMs
- Protection:
  - ECC
  - SDDC (for x4-based memory DIMMs)
  - ADDDC (for x4-based memory DIMMs)

Important:

- The tray only supports fully populated processor and memory configuration (2 processors and 24 DIMMs per node).
- Mixing DIMM speed is not supported.
- ADDDC not supported for 9x4 ECC DIMM (Value)

Storage expansion

Supports E3.S 1T or E3.S 2T NVMe solid-state (SSD) drives.

- Up to four E3.S 1T NVMe SSD at the front of the server (location shared with PCIe adapters)
- Up to two E3.S 2T NVMe SSD at the front of the server (location shared with PCIe adapters)
- Up to two E3.S 1T NVMe SSD on top of processor cold plate on the water loop.

Attention: As a general consideration, do not mix standard 512-byte and advanced 4-KB format drives in the same RAID array because it might lead to potential performance issues.

Expansion slots

Up to two PCIe 5.0 x16 PCIe slots (slot 1 and slot 2) on the front per node for half-height half-length (HHHL) PCIe adapter (location shared with front E3.S NVMe SSDs)

Integrated functions and I/O connectors

Integrated functions

- System I/O board (DCSCM)
- Lenovo XClarity Controller (XCC), which provides service processor control and monitoring functions, video controller, and remote keyboard, video, mouse, and remote drive capabilities.
  - The server supports Lenovo XClarity Controller 3 (XCC3). For additional information about Lenovo XClarity Controller 3 (XCC3), refer to https://pubs.lenovo.com/lxcc-overview/.
- **I/O connectors**
  - One Gigabit Ethernet port with RJ45 connector (Dedicated XCC management connector)
  - Enclosure rear connectors: two Ethernet ports on the System Management Module 3 (SMM3) installed in the rear of the enclosure.

    Note: It is recommended to use SMM3 Ethernet port as the default dedicated management network. If required to use node front Ethernet port as dedicated management network, refer to XCC user guide for network configuration instructions.
  - One Gigabit Ethernet port with RJ45 connector, shared between operating system and Lenovo XClarity Controller.
  - Two 25Gb SFP 28 ports. One port is shared between operating system and Lenovo XClarity Controller.

    Note: Lenovo XClarity Controller connection is mutually exclusive between RJ45 Ethernet connector and 25Gb SFP28 Port 1.
  - Two USB 3.1 Gen 1 (5 Gbps) connectors
  - VGA connector
  - Maintenance port system log connector (Mini USB connector)
  - DisplayPort Alternate Mode Type-C connector
  - External diagnostics handset connector
- Video controller (integrated into Lenovo XClarity Controller)
  - ASPEED
  - SVGA compatible video controller
  - Avocent Digital Video Compression
  - Video memory is not expandable

  Note: Maximum video resolution is 1920 x 1200 at 60 Hz.

Network and I/O connectors

- One Gigabit Ethernet port with RJ45 connector (Dedicated XCC management connector)
- One Gigabit Ethernet port with RJ45 connector, shared between operating system and Lenovo XClarity Controller.
- Two 25Gb SFP 28 ports. One port is shared between operating system and Lenovo XClarity Controller.

  Note: Lenovo XClarity Controller connection is mutually exclusive between RJ45 Ethernet connector and 25Gb SFP28 Port 1.

Storage controllers

Onboard NVMe ports with software RAID support (Intel VROC NVMe RAID)

- Intel VROC standard: requires an activation key and supports RAID levels 0, 1, and 10
- Intel VROC Premium: requires an activation key and supports RAID levels 0, 1, 5, and 10
- Intel VROC Boot: requires an activation key and supports RAID level 1 only

Electrical input

SC750 V4 tray installed in N1380 enclosure
Supports up to four 15000W Power Conversion Stations (PCS):

- The enclosure must be installed with at least three PCS.
- Input voltage: 380 – 480 Vac (Acbel DWC PCS)
- Redundancy: work as N+1 with OVS and N+N with OVS (OVS: oversubscription)
- Resetting SMM3 to factory defaults will cause the PCS redundancy mode to return to the default N+1 mode. If needed, re-configure PCS redundancy mode as the original or as loading required via SMM3.

CAUTION:
Power Conversion Stations and redundant Power Conversion Stations in the enclosure must be with the same brand, power rating, wattage or efficiency level.

Mixing PCS manufactured by different vendors is not supported.

Note: Refer to https://pubs.lenovo.com/mgt_tools_smm3/ for more details of solution power status.

Minimal configuration for debugging

SC750 V4 tray installed in N1380 enclosure

- One N1380 enclosure
- One SC750 V4 tray
- Two 32GB 2Rx8 DDR5 RDIMM per node in slot 7 and slot 18. (one DIMM per processor)
- Three 15000W Power Conversion Stations (PCS)
- One drive (any type) (If OS is needed for debugging)

Operating systems

Supported and certified operating systems:

- Ubuntu Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

References:

- Complete list of available operating systems: https://lenovopress.lenovo.com/osig.
- OS deployment instructions, see "Deploy the operating system" on page 434.

Mechanical specifications

Summary of the mechanical specifications of solution. Depending on the model, some features might not be available, or some specifications might not apply.

Notes:
- Up to eight SC750 V4 trays can be installed in an N1380 13U enclosure.
- Each SC750 V4 tray contains two compute nodes, node A and node B. Node A is the bottom node and node B is the top node when viewing the tray from the front of the N1380 enclosure.
- Access one set of monitor (VGA port) and keyboard/mouse (USB port) peripheral per N1380 enclosure at a time is recommended per radiated emission compliance.

Dimension
- Height: 52.75 mm (2.07 inches) - Depth: 760 mm (29.92 inches) - Width: 545.5 mm (21.47 inches)

Weight
- Weight estimation: 37.215 kg (82.059 lbs) - N1380 enclosure with eight SC750 V4 trays and four DWC PCS: approximately 484.544 kg (1068.420 lbs)

Environmental specifications

Summary of the environmental specifications of solution. Depending on the model, some features might not be available, or some specifications might not apply.

Attention: Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For water quality requirement, see Lenovo Neptune Direct Water-Cooling Standards.

Notes:

- Up to eight SC750 V4 trays can be installed in an N1380 13U enclosure.
- Each SC750 V4 tray contains two compute nodes, node A and node B. Node A is the bottom node and node B is the top node when viewing the tray from the front of the N1380 enclosure.
- Access one set of monitor (VGA port) and keyboard/mouse (USB port) peripheral per N1380 enclosure at a time is recommended per radiated emission compliance.

Environment

- Air temperature requirements:
  - Operating:
    - ASHRAE class A3: 5°C - 40°C (41°F - 104°F); when the altitude exceeds 900 m (2953 ft), the maximum ambient temperature value decreases by 1°C (1.8°F) with every 175 m (574 ft) of altitude increase.
  - Powered off: 5°C - 45°C (41°F - 113°F)
  - Shipping/storage: -40°C - 60°C (-40°F - 140°F)
- Relative humidity (non-condensing):
  - Operating: ASHRAE Class A3: 8% - 85%, maximum dew point : 24°C (75°F)
  - Shipment/storage: 8% - 90%
- Maximum altitude: 3048 m (10 000 ft)

Note: The solution is designed for standard data center environment and recommended to be placed in industrial data center.

Water requirements — pressure drop

Table 1. Pressure drop for S45 (45°C from CDU)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
SC750 V4 quantity	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)
1	0.39	0.38	0.41	0.42
2	0.35	0.40	0.41	0.42

Table 1. Pressure drop for S45 (45°C from CDU) (continued)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
3	0.39	0.40	0.42	0.43
4	0.40	0.41	0.42	0.44
5	0.41	0.42	0.43	0.45
6	0.41	0.43	0.44	0.46
7	0.43	0.44	0.46	0.47
8	0.44	0.45	0.47	0.49

Table 2. Pressure drop for S40 (40°C from CDU)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
SC750 V4 quantity	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)
1	0.33	0.33	0.34	0.34
2	0.33	0.34	0.34	0.35
3	0.34	0.34	0.35	0.37
4	0.35	0.35	0.36	0.37
5	0.35	0.36	0.37	0.38
6	0.36	0.37	0.38	0.39
7	0.37	0.38	0.39	0.40
8	0.38	0.39	0.40	0.42

Table 3. Pressure drop for S32 (32°C from CDU)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
SC750 V4 quantity	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)
1	0.22	0.22	0.22	0.23
2	0.22	0.22	0.23	0.23
3	0.21	0.23	0.23	0.24
4	0.22	0.23	0.23	0.24
5	0.23	0.23	0.24	0.25
6	0.23	0.24	0.25	0.25
7	0.24	0.25	0.25	0.26
8	0.25	0.25	0.26	0.27

Table 4. Pressure drop for S27 (27°C from CDU)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
SC750 V4 quantity	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)	Pressure drop (bar)
1	0.22	0.22	0.22	0.23
2	0.22	0.22	0.23	0.23
3	0.21	0.23	0.23	0.24
4	0.22	0.23	0.23	0.24

Table 4. Pressure drop for S27 (27°C from CDU) (continued)

	1 PCS	**2 PCS**	**3 PCS**	**4 PCS**
5	0.23	0.23	0.24	0.25
6	0.23	0.24	0.25	0.25
7	0.24	0.25	0.25	0.26
8	0.25	0.25	0.26	0.27

Water requirements — water flow rates

Water requirements — water flow rates

Attention: The water required to initially fill the system side cooling loop must be reasonably clean, bacteria-free water (<100 CFU/ml) such as de-mineralized water, reverse osmosis water, de-ionized water, or distilled water. The water must be filtered with an in-line 50 micron filter (approximately 288 mesh). The water must be treated with anti-biological and anti-corrosion measures. Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For more information please see Lenovo Neptune Direct Water-Cooling Standards.

Water flow rates

- **45°C water temperature**
  - Water flow rate per SC750 V4 tray: 3.0 lpm
  - Water flow rate per PCS : 2.8 lpm
  - Water flow rate per enclosure: the sum of 3.0 lpm*(the number of trays) and 2.8 lpm*(the number of PCS)
- **40°C water temperature**
  - Water flow rate per SC750 V4 tray: 2.8 lpm
  - Water flow rate per PCS : 2.5 lpm
  - Water flow rate per enclosure: the sum of 2.8 lpm*(the number of trays) and 2.5 lpm*(the number of PCS)
- **32°C water temperature**
  - Water flow rate per SC750 V4 tray: 2.2 lpm
  - Water flow rate per PCS : 2.0 lpm
  - Water flow rate per enclosure: the sum of 2.2 lpm*(the number of trays) and 2.0 lpm*(the number of PCS)
- **27°C water temperature**
  - Water flow rate per SC750 V4 tray: 2.2 lpm
  - Water flow rate per PCS : 2.0 lpm
  - Water flow rate per enclosure: the sum of 2.2 lpm*(the number of trays) and 2.0 lpm*(the number of PCS)

For example, when an N1380 enclosure is installed with eight SC750 V4 trays and four PCS, and the water temperature is 45°C, the enclosure water flow rate is 35.2 lpm (3.0 lpm*8 and 2.8 lpm*4)

Particulate contamination

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document.

Attention: Environment quality must be maintained over the lifetime of the system to receive warranty and support on affecting components. For water quality requirement, see Lenovo Neptune Direct Water-Cooling Standards.

Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If Lenovo determines that the levels of particulates or gases in your environment have caused damage to the device, Lenovo may condition provision of repair or replacement of devices or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 5. Limits for particulates and gases

Contaminant	Limits
Reactive gases	Severity level G1 as per ANSI/ISA 71.04-1985[1]: • The copper reactivity level shall be less than 200 Angstroms per month (Å/month ≈ 0.0035 µg/cm^2-hour weight gain).[2] • The silver reactivity level shall be less than 200 Angstroms (Å/month ≈ 0.0035 µg/cm^2-hour weight gain).[3] • The reactive monitoring of gaseous corrosivity must be conducted approximately 5 cm (2 in.) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor or where the air velocity is much higher.
Airborne particulates	Data centers must meet the cleanliness level of ISO 14644-1 class 8. For data centers without airside economizer, the ISO 14644-1 class 8 cleanliness might be met by choosing one of the following filtration methods: • The room air might be continuously filtered with MERV 8 filters. • Air entering a data center might be filtered with MERV 11 or preferably MERV 13 filters. For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center. • The deliquescent relative humidity of the particulate contamination should be more than 60% RH.[4] • Data centers must be free of zinc whiskers.[5]

[1] ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

[2] The derivation of the equivalence between the rate of copper corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.

[3] The derivation of the equivalence between the rate of silver corrosion growth in the thickness of the corrosion product in Å/month and the rate of weight gain assumes that Ag_2S is the only corrosion product.

[4] The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.

[5] Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.

Water quality requirement

Attention: The water required to initially fill the system side cooling loop must be reasonably clean, bacteria-free water (<100 CFU/ml) such as de-mineralized water, reverse osmosis water, de-ionized water, or distilled water. The water must be filtered with an in-line 50 micron filter (approximately 288 mesh). The water must be treated with anti-biological and anti-corrosion measures. Environment quality must be maintain over the lifetime of the system to receive warranty and support on affecting components. For more information please see Lenovo Neptune Direct Water-Cooling Standards.

Management options

The XClarity portfolio and other system management options described in this section are available to help you manage the servers more conveniently and efficiently.

Overview

Options	Description
Lenovo XClarity Controller	Baseboard management controller (BMC) Consolidates the service processor functionality, Super I/O, video controller, and remote presence capabilities into a single chip on the server system board (system board assembly). **Interface** • CLI application • Web GUI interface • Mobile application • Redfish API **Usage and downloads** https://pubs.lenovo.com/lxcc-overview/
Lenovo XCC Logger Utility	Application that reports the XCC events to local OS system log. **Interface** • CLI application **Usage and downloads** • https://pubs.lenovo.com/lxcc-logger-linux/ • https://pubs.lenovo.com/lxcc-logger-windows/
Lenovo XClarity Administrator	Centralized interface for multi-server management. **Interface** • Web GUI interface • Mobile application • REST API **Usage and downloads** https://pubs.lenovo.com/lxca/
Lenovo XClarity Essentials toolset	Portable and light toolset for server configuration, data collection, and firmware updates. Suitable both for single-server or multi-server management contexts. **Interface** • **OneCLI**: CLI application • **Bootable Media Creator**: CLI application, GUI application • **UpdateXpress**: GUI application **Usage and downloads** https://pubs.lenovo.com/lxce-overview/

Options	Description
Lenovo XClarity Provisioning Manager	UEFI-based embedded GUI tool on a single server that can simplify management tasks. **Interface** • Web interface (BMC remote access) • GUI application **Usage and downloads** https://pubs.lenovo.com/lxpm-overview/ **Important:** Lenovo XClarity Provisioning Manager (LXPM) supported version varies by product. All versions of Lenovo XClarity Provisioning Manager are referred to as Lenovo XClarity Provisioning Manager and LXPM in this document, unless specified otherwise. To see the LXPM version supported by your server, go to https://pubs.lenovo.com/lxpm-overview/.
Lenovo XClarity Integrator	Series of applications that integrate the management and monitoring functionalities of the Lenovo physical servers with the software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center while delivering additional workload resiliency. **Interface** • GUI application **Usage and downloads** https://pubs.lenovo.com/lxci-overview/
Lenovo XClarity Energy Manager	Application that can manage and monitor server power and temperature. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lxem
Lenovo Capacity Planner	Application that supports power consumption planning for a server or rack. **Interface** • Web GUI Interface **Usage and downloads** https://datacentersupport.lenovo.com/solutions/lnvo-lcp
SMM3 (ThinkSystem high-density servers only)	A hot-swap enclosure management module that helps you easily manage the system Power Conversion Station (PCS) and fan speeds. It monitors the fan, power and enclosure status with event logs. **Interface** • Web GUI Interface **Usage and downloads** https://pubs.lenovo.com/mgt_tools_smm3/

Functions

Options		Functions							
		Multi-system mgmt	OS deployment	System configuration	Firmware updates[1]	Events/alert monitoring	Inventory/logs	Power mgmt	Power planning
Lenovo XClarity Controller				√	√[2]	√	√[4]		
Lenovo XCC Logger Utility						√			
Lenovo XClarity Administrator		√	√	√	√[2]	√	√[4]		
Lenovo XClarity Essentials toolset	OneCLI	√		√	√[2]	√	√		
	Bootable Media Creator			√	√[2]		√[4]		
	UpdateXpress			√	√[2]				
Lenovo XClarity Provisioning Manager			√	√	√[3]		√[5]		
Lenovo XClarity Integrator		√		√	√	√	√	√[6]	
Lenovo XClarity Energy Manager		√				√		√	
Lenovo Capacity Planner									√[7]
SMM3 (ThinkSystem high-density servers only)					√	√	√	√	

Notes:

1. Most options can be updated through the Lenovo tools. Some options, such as GPU firmware or Omni-Path firmware require the use of supplier tools.
2. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** to update firmware using Lenovo XClarity Administrator, Lenovo XClarity Essentials, or Lenovo XClarity Controller.
3. Firmware updates are limited to Lenovo XClarity Provisioning Manager, Lenovo XClarity Controller, and UEFI updates only. Firmware updates for optional devices, such as adapters, are not supported.
4. The server UEFI settings for option ROM must be set to **Auto** or **UEFI** for detailed adapter card information, such as model name and firmware levels, to be displayed in Lenovo XClarity Administrator, Lenovo XClarity Controller, or Lenovo XClarity Essentials.
5. Limited inventory.
6. Power management function is supported only by Lenovo XClarity Integrator for VMware vCenter.
7. It is highly recommended that you check the power summary data for your server using Lenovo Capacity Planner before purchasing any new parts.

Chapter 2. Server components

This section contains information about each of the components associated with the server.

Front view

This section contains information on the front view of the solution.

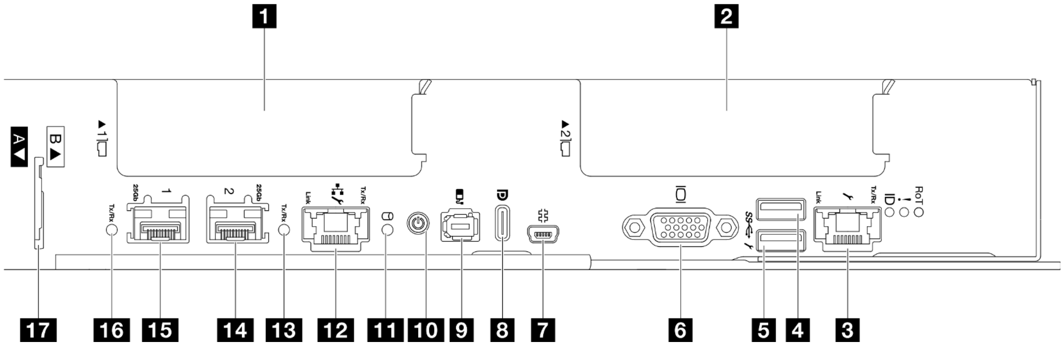


Figure 2. Front view (showing Node B as example)

Table 6. Components on front view

1 PCIe slot 1 / Drive 1, 3 **2** PCIe slot 2 / Drive 0, 2 For information on PCIe adapter or drive configuration and numbering, see "Front drive and PCIe adapter configuration" on page 21.
3 Dedicated XCC management connector (1 Gb RJ45) **Notes:** • It is recommended to use SMM3 Ethernet port as the default dedicated management network. If required to use node front Ethernet port as dedicated management network, refer to XCC user guide for network configuration instructions. • When using LXPM to set XCC network connection, make sure to assign unique IP addresses to Ethernet Port 1 and Ethernet Port 2. Ethernet Port 1 IP address goes to the Ethernet port on SMM3, and Ethernet Port 2 IP address goes to dedicated XCC management connector on the front of the node. (UEFI setup page only supports setting XCC network connection to the Ethernet port on SMM3.)
4 USB 3.1 Gen 1 (5 Gbps) connector
5 USB 3.1 Gen 1 (5 Gbps) connector with Lenovo XClarity Controller management
6 VGA connector
7 Maintenance port system log connector (Mini USB connector)
8 DisplayPort Alternate Mode Type-C connector This connector only supports cable or device with DisplayPort Alternative Mode functionality.
9 External diagnostic handset connector
10 Power button with LED (green)
11 Drive LED (green)

Table 6. Components on front view (continued)

12 1 Gb RJ45 Ethernet port (share-NIC)
13 25 Gb SFP 28 Port 2 link and activity LED (green)
14 25 Gb SFP 28 Ethernet port–Port 2
15 25 Gb SFP 28 Ethernet port–Port 1 (Share-NIC)
16 25 Gb SFP 28 Port 1 link and activity LED (green)
17 XCC information pull-out tab

For more information on LED, see "Troubleshooting by system LEDs and diagnostics display" on page 439.

Tray top view

This section contains information on the top view of the tray.

Tray top view

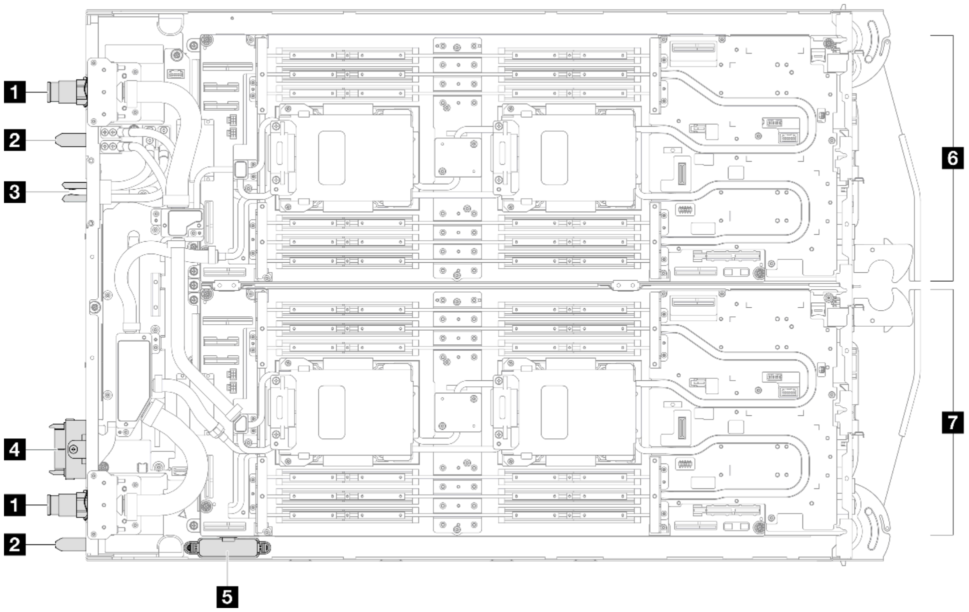


Figure 3. Tray top view

Table 7. Components on tray top view

1 Water loop quick connect	**5** Leakage sensor controller
2 Guide pin	**6** Node B
3 Bus bar connector	**7** Node A
4 System management interface	

Node top view

This section contains information on the top view of the node.

Node top view

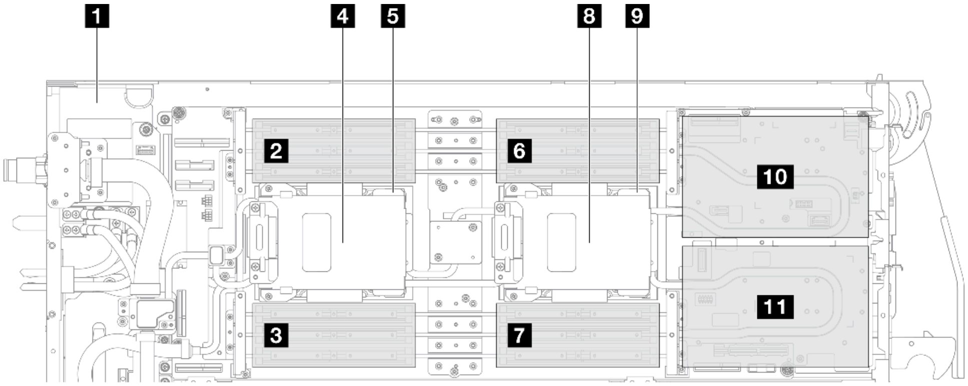


Figure 4. Node top view

Table 8. Components on node top view

1 Power distribution board	**6** Memory module slot 1–6
2 Memory module slot 13–18	**7** Memory module slot 7–12
3 Memory module slot 19–24	**8** Drive 4 (E3.S 1T drive placed on top of processor 1 cold plate)
4 Drive 5 (E3.S 1T drive placed on top of processor 2 cold plate)	**9** Processor 1
5 Processor 2	**10** PCIe slot 2 / Drive 0, 2 **11** PCIe slot 1 / Drive 1, 3 For information on PCIe adapter or drive configuration and numbering, see "Front drive and PCIe adapter configuration" on page 21.

System-board assembly layout

The illustrations in this section provide information about the connectors, switches, and jumpers that are available on the system-board assembly.

System-board assembly connectors

The following illustrations show the internal connectors on the system-board assembly.

Processor and DIMM slot numbering

The following illustration shows the location of the DIMM slots numbering on the system-board assembly.

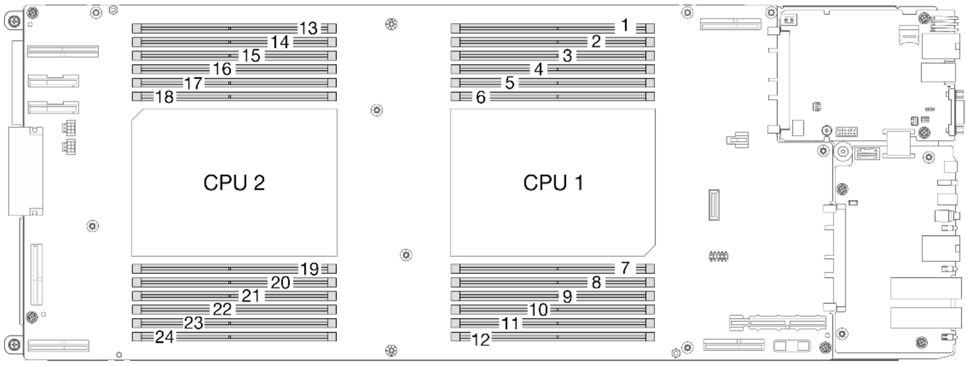


Figure 5. Processor and DIMM slot numbering

Internal connectors on system-board assembly

The following illustration shows the connectors on the system-board assembly.

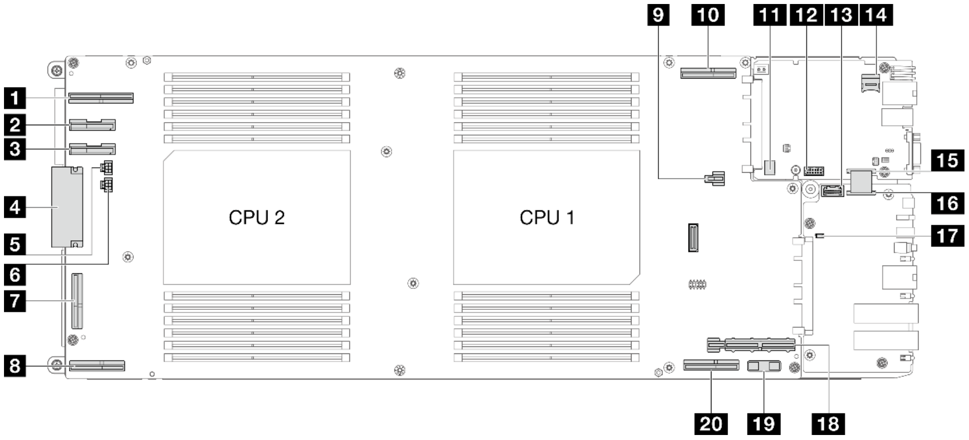


Figure 6. Internal connectors on system-board assembly

Table 9. Internal connectors on compute node system board

1 Drive 0, 2 / PCIe riser 2 PCIe x16 connector	**11** TCM connector
2 Drive 4 connector	**12** Serial log connector
3 Drive 5 connector	**13** Sideband connector
4 Power distribution board connector	**14** MicroSD card socket (reserved)
5 Drive 0, 2 power connector / aux power connector	**15** PHY connector (for cable linking system I/O board and FIO board)
6 Aux power connector	**16** FIO connector (for cable linking system I/O board and FIO board)
7 (PCIe x16 MCIO 3 connector, reserved)	**17** COM port connector
8 (PCIe x16 MCIO 4 connector, reserved)	**18** Drive 1, 3 connector / PCIe riser 1 PCIe x16 connector
9 PCIe riser 2 power connector	**19** CMOS battery holder
10 (PCIe x16 MCIO 2 connector, reserved)	**20** (PCIe x16 MCIO 1 connector, reserved)

System I/O board, front I/O board, and processor board

The following illustrations show the locations of different boards that the system-board assembly consists of.

Locations of system I/O board, front I/O board, and processor board

The system-board assembly consists of system I/O board, front I/O board, and processor board. See the following illustration for their locations.

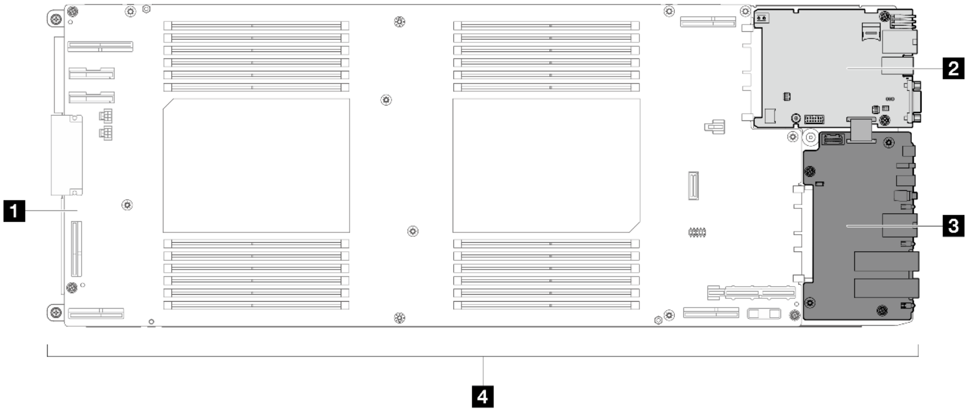


Figure 7. Locations of system I/O board, front I/O board, and processor board

Table 10. Locations of system I/O board, front I/O board, and processor board

1 Processor board	**2** System I/O board System I/O board is also known as also known as Datacenter-ready Secure Control Module (DCSCM).
3 Front I/O board	**4** System-board assembly

System-board switches

The following illustration shows the location and description of the switches.

Note: If there is a clear protective sticker on the top of the switch blocks, you must remove and discard it to access the switches.

Important:

1. Before you change any switch settings or move any jumpers, turn off the solution; then, disconnect all power cords and external cables. Review the following information:
   - https://pubs.lenovo.com/safety_documentation/
   - "Installation Guidelines" on page 33
   - "Handling static-sensitive devices" on page 36
   - "Power off the solution" on page 48
2. Any system-board switch or jumper block that is not shown in the illustrations in this document are reserved.

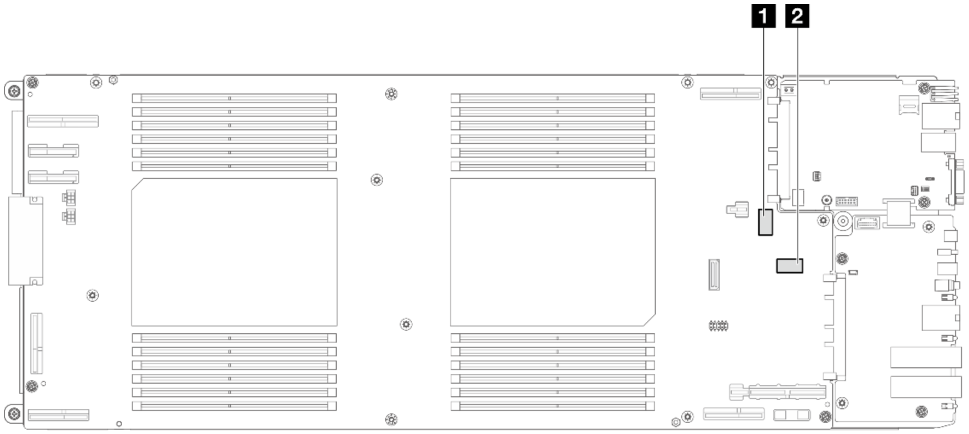


Figure 8. System board switches

Table 11. System-board switches

1 SW5	**2** SW4

Table 12. Switch block definition

Switch number	Switch name	Enable switch feature
SW4 Bit 8	Password reset	To enable bypassing password power-on: 1. Toggle the switch to the opposite side. 2. Power on the system. This power-on does not require password. 3. Boot into UEFI setup clear power-on password first; then, set a new power-on password 4. Next power-on will require password (the one set in Step 3).
SW5 Bit 4	Clear CMOS	**Default** is OFF (disabled). To enable the switch feature: 1. Set the switch to “ON” 2. Wait for about five minutes 3. Set the switch to “OFF” 4. Power on the system 5. RTC will be cleared.

Power distribution board connectors

The following illustrations show the internal connectors on the power distribution board.

Internal connectors on power distribution board

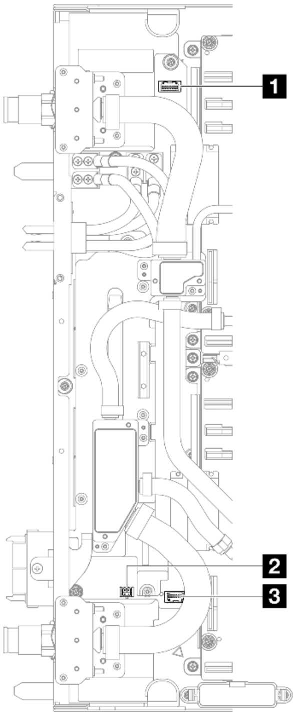


Table 13. Internal connectors on power distribution board

1 P3 connector
2 Leakage sensor connector
3 P2 connector

Front drive and PCIe adapter configuration

This section contains information on the front drive and PCIe adapter configuration supported by SC750 V4.

See the following for more information on front drive and PCIe adapter numbering and configuration.

- "Front drive configuration" on page 21
- "PCIe adapter configuration" on page 22

In the illustrations below, **A** represents Node A and **B** represents Node B.

Front drive configuration

1. **Single front drive configuration**
   - E3.S 1T
   - E3.S 2T

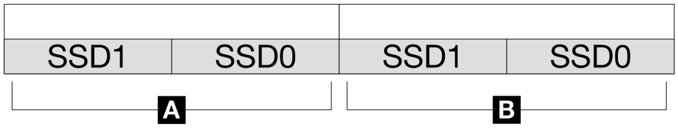


Figure 9. E3.S 1T / E3.S 2T single front drive configuration

2. **Dual front drives configuration**

- E3.S 1T

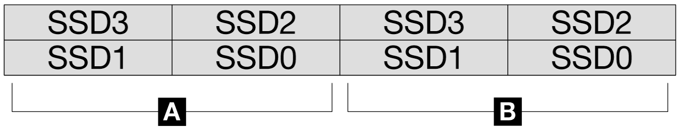


Figure 10. E3.S 1T dual front drives configuration

PCIe adapter configuration

1. **Standalone PCIe configuration**

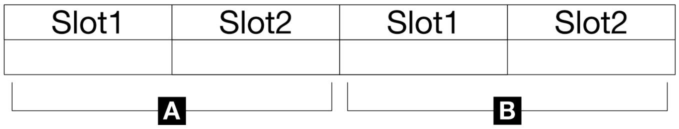


Figure 11. Standalone PCIe configuration

2. **Socket direct PCIe configuration**

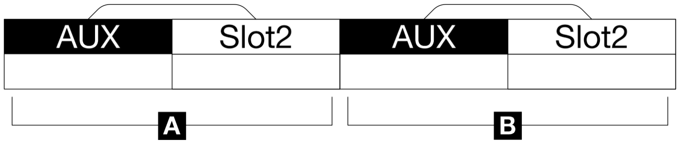


Figure 12. Socket direct PCIe configuration

3. **Shared I/O PCIe configuration**

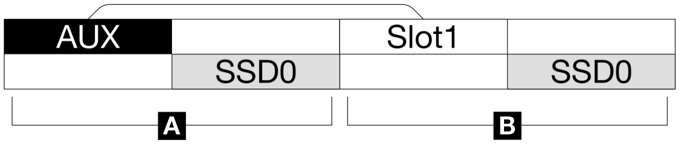


Figure 13. Shared I/O PCIe configuration—with single drive per cage

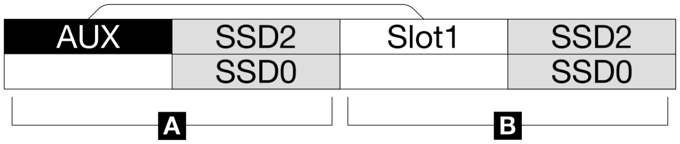


Figure 14. Shared I/O PCIe configuration—with dual drives per cage

System LEDs and diagnostics display

See the following section for information on available enclosure LEDs and diagnostics display.

For more information, refer to "Troubleshooting by system LEDs and diagnostics display" on page 439.

Chapter 3. Parts list

Use the parts list to identify each of the components that are available for your solution.

For more information about ordering parts:

1. Go to **http://datacentersupport.lenovo.com** and navigate to the support page for your solution.
2. Click **Parts**.
3. Enter the serial number to view a listing of parts for your solution.

It is highly recommended that you check the power summary data for your solution using Lenovo Capacity Planner before purchasing any new parts.

Note: Depending on the model, your solution might look slightly different from the illustration.

The parts listed in the following table are identified as one of the following:

- **T1:** Tier 1 customer replaceable unit (CRU). Replacement of Tier 1 CRUs is your responsibility. If Lenovo installs a Tier 1 CRU at your request with no service agreement, you will be charged for the installation.
- **T2:** Tier 2 customer replaceable unit (CRU). You may install a Tier 2 CRU yourself or request Lenovo to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **F:** Field replaceable unit (FRU). FRUs must be installed only by trained service technicians.
- **C:** Consumable and Structural parts. Purchase and replacement of consumable and structural parts (components, such as a filler or bezel) is your responsibility. If Lenovo acquires or installs a structural component at your request, you will be charged for the service.

SC750 V4 parts list

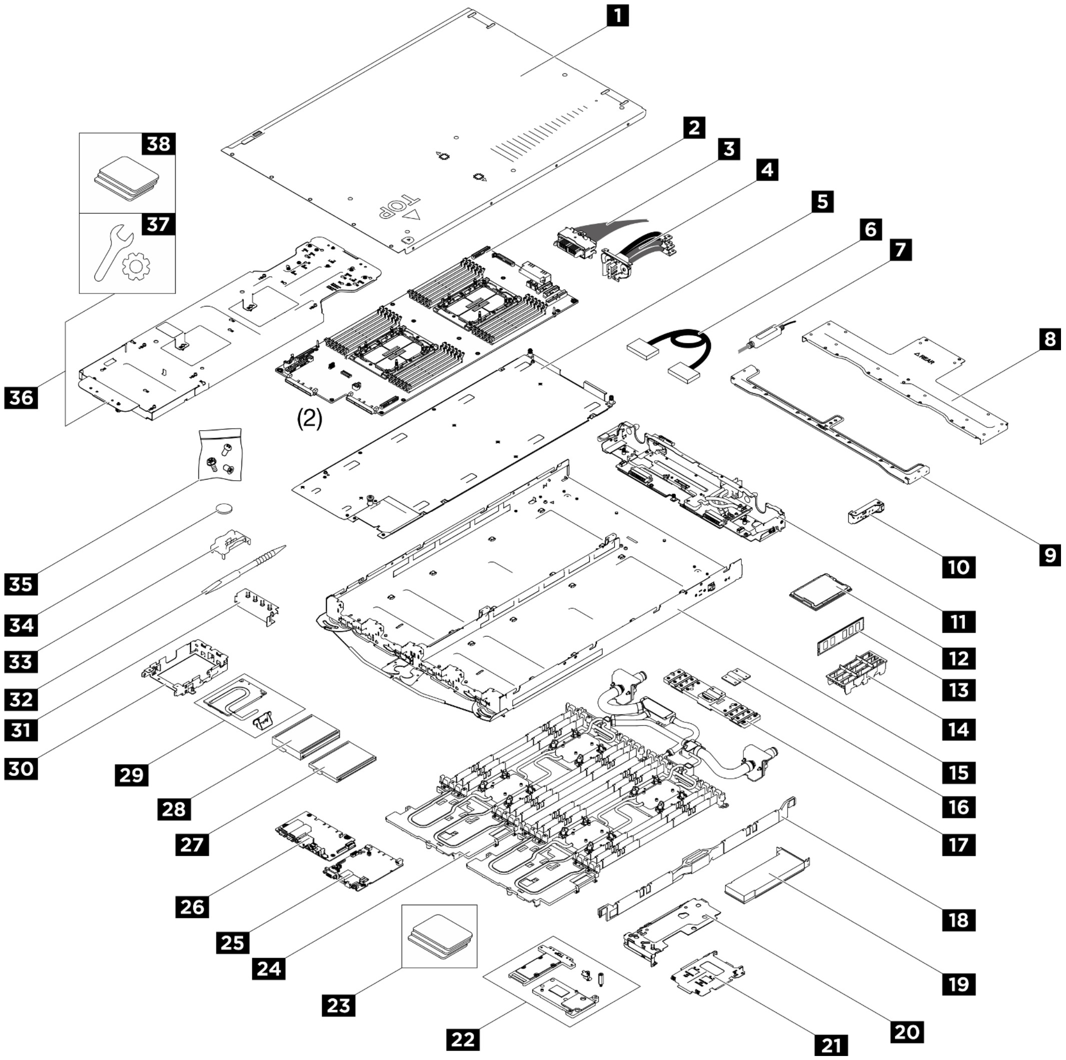


Table 14. SC750 V4 parts list

Index	Description	Type
For more information about ordering parts: 1. Go to **http://datacentersupport.lenovo.com** and navigate to the support page for your solution. 2. Click **Parts**. 3. Enter the serial number to view a listing of parts for your solution.		
1	Top cover	F
2	Processor board	F
3	System management sideband cable kit	F
4	Bus bar connector module	F
5	Tray for processor board, system I/O board, and front I/O board	F
6	Cable	F
7	Leakage sensor module	F

Table 14. SC750 V4 parts list (continued)

Index	Description	Type
8	Rear cross brace	F
9	Front cross brace	F
10	Foolproof module	F
11	Power distribution board	F
12	Processor	F
13	Memory module	F
14	DIMM cover	F
15	Node tray	
16	VR conduction plate cover	F
17	VR conduction plate	F
18	DIMM cooling bar	F
19	PCIe riser cage	F
20	PCIe adapter	F
21	Middle E3.S drive cage	F
22	Component conduction plate	F
23	Component gap pad, putty pad, or single-use gap pad	F
24	Water loop	F
25	System I/O board (DCSCM)	F
26	Front I/O board	F
27	E3.S 1T drive	F
28	E3.S 2T drive	F
29	E3.S drive heat sink	F
30	Front E3.S drive cage	F
31	Blank bezel filler	F
32	DIMM tool	F
33	DIMM comb	F
34	CMOS battery	F
35	Screw	F
36	Water loop service kit	F
37	Miscellaneous parts kit	F
38	Water loop gap pad kit	F

Power cords

Specific three-phase power cables are required for N1380 enclosure installed with SC750 V4 traysSC777 V4 trays.

To view the power cords that are available for the server:

1. Go to:

   http://dcsc.lenovo.com/#/

2. Click **Preconfigured Model** or **Configure to order**.
3. Enter the machine type and model for your server to display the configurator page.
4. Click **Power → Power Cables** to see all line cords.

Notes:

- For your safety, a power cord with a grounded attachment plug is provided to use with this product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.
- Power cords for this product that are used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by UL standard and Canadian standard (CSA standards) with certification mark of UL and C-UL.
- For Y-splitter power cord units intended to be operated at three-phase 380-415 volts with IEC 60309 (U.S. use): Use a UL-listed, UL-certified, and CSA-certified cord set consisting of a maximum 60 amperes. This Y-splitter power cord is for Lenovo special use, and the middle connector of the cable shall not be hot-plugged.
- For units intended to be operated at three phase 380-415 volts with IEC 60309 (U.S. use): Use a UL-listed, UL-certified, and CSA-certified cord set consisting of a maximum 30 amperes.
- Power cords for a specific country or region are usually available only in that country or region.

Chapter 4. Unboxing and setup

Information in this section assists you on unboxing and setting up the server. When unboxing the server, check if the items in the package are correct, and learn where to find information of server serial number and Lenovo XClarity Controller access. Make sure to follow the instructions in "Solution setup checklist" on page 29 when setting up the server.

Solution package contents

When you receive your solution, verify that the shipment contains everything that you expected to receive.

The solution package includes the following items:

- DWC tray
- Enclosure
- Rail kit
- Four detachable chassis lift handles
- Material box, including items such as power cords*, accessory kit, and printed documents.

Notes:

- Some of the items listed are available on select models only.
- Items marked with asterisk(*) are optional.

If any item is missing or damaged, contact your place of purchase. Ensure that you retain your proof of purchase and packing material. They might be required to receive warranty service.

Identify the solution and access the Lenovo XClarity Controller

This section contains instruction on how to identify your solution and where to find the Lenovo XClarity Controller access information.

Identifying your solution

When you contact Lenovo for help, the machine type, model, and serial number information help support technicians to identify your solution and provide faster service.

The illustration below shows the location of the ID label which contains the enclosure model number, machine type, and serial number of the solution. You can also add other system information labels to the front of the enclosure in the customer label spaces.

1 Enclosure label

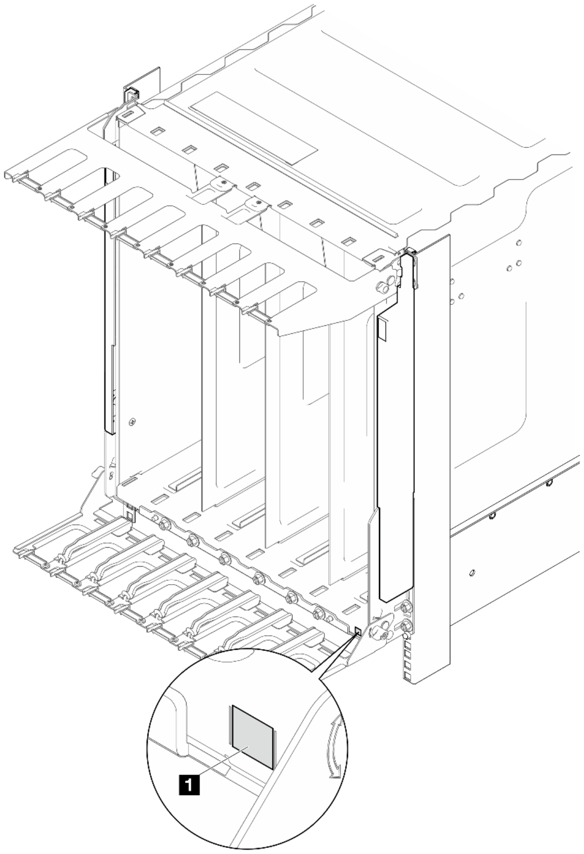


Figure 15. Enclosure label on the front of the enclosure

The tray model number can be found on the front of the tray, as shown in the following illustration.

1 SC750 V4 tray model number

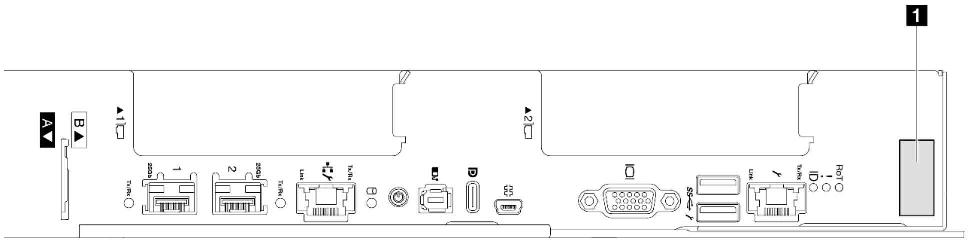


Figure 16. SC750 V4 tray model number

Lenovo XClarity Controller network access label

In addition, the Lenovo XClarity Controller network access label for both nodes can be found on the pull out information tag located at the front of the tray. You can use the information on the pull out tag to access the XCC MAC address and LLA for each node. The left node information is on the left side and the right node information is on the right side. You can also use the information tag for your own node labeling information such as the hostname, the system name and the inventory bar code.

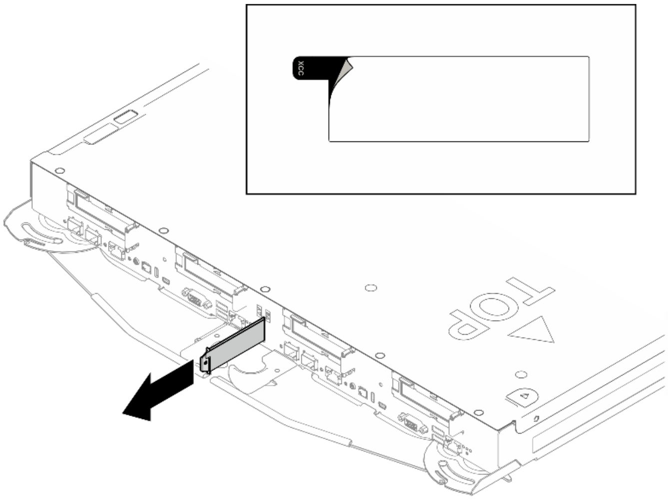


Figure 17. Lenovo XClarity Controller network access label on the pull-out information tab

Service information QR code

On the inside surface of the tray cover, there is a quick response (QR) code that provides mobile access to service information. You can scan the QR code with a mobile device using a QR code reader application and get quick access to the Service Information web page. The Service Information web page provides additional information for parts installation and replacement videos, and error codes for solution support.

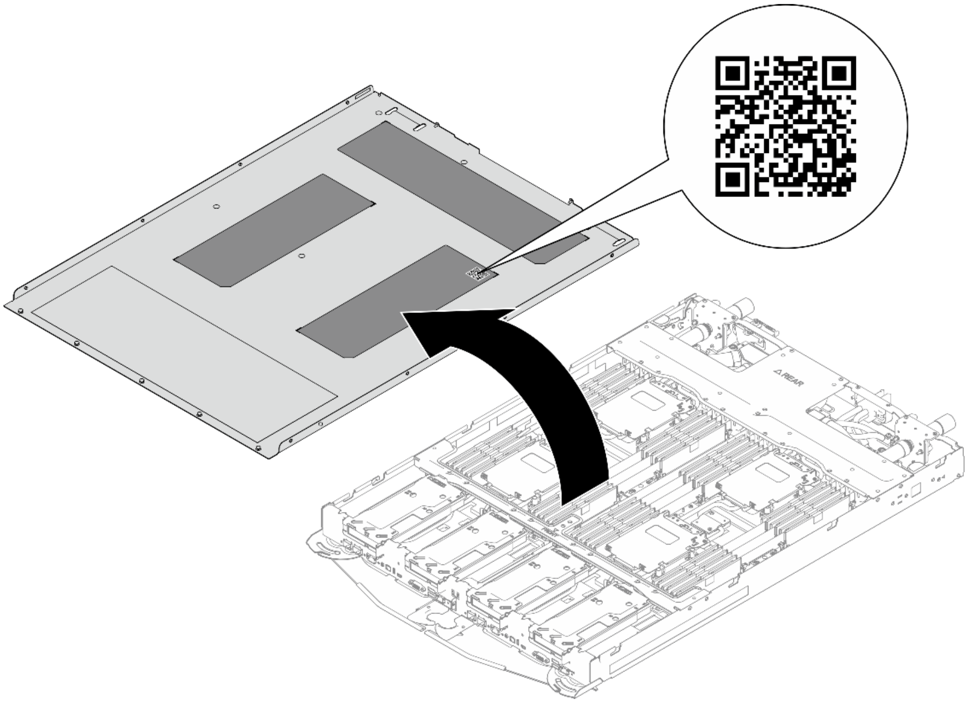


Figure 18. Service Label and QR code

Solution setup checklist

Use the solution setup checklist to ensure that you have performed all tasks that are required to set up your solution.

The solution setup procedure varies depending on the configuration of the solution when it was delivered. In some cases, the solution is fully configured and you just need to connect the solution to the network and an AC power source, and then you can power on the solution. In other cases, the solution needs to have hardware options installed, requires hardware and firmware configuration, and requires an operating system to be installed.

The following steps describe the general procedure for setting up a solution.

Setup the solution hardware

Complete the following procedures to setup the solution hardware.

1. Unpack the solution package. See "Solution package contents" on page 27.
2. Install any required hardware or solution options. See the related topics in Chapter 5 "Hardware replacement procedures" on page 33.
3. Connect all external cables to the solution. See Chapter 2 "Server components" on page 15 for connectors locations.

   Typically, you will need to connect the following cables:

   - Connect solution to the power source
   - Connect solution to the data network
   - Connect the solution to the storage device
   - Connect the solution to the management network
4. Power on the solution.

   Power button location and power LED are specified in "Troubleshooting by system LEDs and diagnostics display" on page 439.

   The solution can be turned on (power LED on) in any of the following ways:

   - You can press the power button.
   - The solution can restart automatically after a power interruption.
   - The solution can respond to remote power-on requests sent to the Lenovo XClarity Controller.

   Note: You can access the management processor interface to configure the system without powering on the solution. Whenever the solution is connected to power, the management processor interface is available. For details about accessing the management solution processor, see "Opening and Using the XClarity Controller Web Interface" section in the XCC documentation compatible with your solution at https://pubs.lenovo.com/lxcc-overview/.
5. Validate the solution. Make sure that the power LED, Ethernet connector LED, and network LED are lit with green light, which means the solution hardware was set up successfully.

   See "Troubleshooting by system LEDs and diagnostics display" on page 439 for more information on the LED indications.

Configure the system

Complete the following procedures to configure the system. For detailed instructions, refer to Chapter 6 "System configuration" on page 425.

1. Set the network connection for theLenovo XClarity Controller to the management network.
2. Update the firmware for the solution, if necessary.
3. Configure the firmware for the solution.

   The following information is available for RAID configuration:

  - https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction
  - https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources
4. Install the operating system.
5. Back up the solution configuration.
6. Install the applications and programs for which the solution is intended to be used.

Chapter 5. Hardware replacement procedures

This section provides installation and removal procedures for all serviceable system components. Each component replacement procedure references any tasks that need to be performed to gain access to the component being replaced.

For more information about ordering parts:

1. Go to **http://datacentersupport.lenovo.com** and navigate to the support page for your solution.
2. Click **Parts**.
3. Enter the serial number to view a listing of parts for your solution.

Note: If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, See "Update the firmware" on page 427.

Installation Guidelines

Before installing components in your server, read the installation guidelines.

Before installing optional devices, read the following notices carefully:

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Read the safety information and guidelines to ensure your safety at work:
  - A complete list of safety information for all products is available at:

    https://pubs.lenovo.com/safety_documentation/
  - The following guidelines are available as well: "Handling static-sensitive devices" on page 36.
- Make sure the components you are installing are supported by your server.
  - For a list of supported optional components for the server, see https://serverproven.lenovo.com.
  - For the option package contents, see https://serveroption.lenovo.com/.
- For more information about ordering parts:
  1. Go to **http://datacentersupport.lenovo.com** and navigate to the support page for your server.
  2. Click **Parts**.
  3. Enter the serial number to view a listing of parts for your server.
- When you install a new server, download and apply the latest firmware. This will help ensure that any known issues are addressed, and that your server is ready to work with optimal performance. Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to download firmware updates for your server.

  Important: Some cluster solutions require specific code levels or coordinated code updates. If the component is part of a cluster solution, verify that the latest Best Recipe code level menu for cluster supported firmware and driver before you update the code.
- If you replace a part, such as an adapter, that contains firmware, you might also need to update the firmware for that part. For more information about updating firmware, See "Update the firmware" on page 427.

- It is good practice to make sure that the server is working correctly before you install an optional component.
- Keep the working area clean, and place removed components on a flat and smooth surface that does not shake or tilt.
- Do not attempt to lift an object that might be too heavy for you. If you have to lift a heavy object, read the following precautions carefully:
  - Make sure that you can stand steadily without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes related to the disk drives.
- Have a small flat-blade screwdriver, a small Phillips screwdriver, and a T8 torx screwdriver available.
- To view the error LEDs on the system board and internal components, leave the power on.
- You do not have to turn off the server to remove or install hot-swap power supplies, hot swap fans, or hot-plug USB devices. However, you must turn off the server before you perform any steps that involve removing or installing adapter cables, and you must disconnect the power source from the server before you perform any steps that involve removing or installing a riser card.
- When replacing Power Conversion Stations or fans, make sure to refer to redundancy rules for these components.
- Blue on a component indicates touch points, where you can grip to remove a component from or install it in the server, open or close a latch, and so on.
- Orange on a component or a orange on or near a component indicates that the component can be hot-swapped if the server and operating system support hot-swap capability, which means that you can remove or install the component while the server is still running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- The Red strip on the drives, adjacent to the release latch, indicates that the drive can be hot-swapped if the server and operating system support hot-swap capability. This means that you can remove or install the drive while the server is still running.

  Note: See the system specific instructions for removing or installing a hot-swap drive for any additional procedures that you might need to perform before you remove or install the drive.
- After finishing working on the server, make sure you reinstall all safety shields, guards, labels, and ground wires.

Safety inspection checklist

Use the information in this section to identify potentially unsafe conditions with your server. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury.

Note: The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations.

Note: The set-up of the server is made in the server room only.

CAUTION:

This equipment must be serviced by trained personnel, as defined by the IEC 62368-1, the standard for Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology. Lenovo assumes you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Equipment must be installed in a restricted access location and access to the equipment is controlled by the authority responsible for the location.

Important: Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Use the following checklist to verify that there are no potentially unsafe conditions:

1. Make sure that the power is off and the power cord is disconnected.
2. Check the power cord.
   - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   - Make sure that the power cord is the correct type.

     To view the power cords that are available for the server:

     a. Go to:

        http://dcsc.lenovo.com/#/

     b. Click **Preconfigured Model** or **Configure to order**.
     c. Enter the machine type and model for your server to display the configurator page.
     d. Click **Power → Power Cables** to see all line cords.
   - Make sure that the insulation is not frayed or worn.
3. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
4. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
5. Check for worn, frayed, or pinched cables.
6. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

System reliability guidelines

Review the system reliability guidelines to ensure proper system cooling and reliability.

Make sure the following requirements are met:

- When the server comes with redundant power, a Power Conversion Station must be installed in each power-supply bay.
- Adequate space around the server must be spared to allow server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place any object in front of the fans.
- For proper cooling and airflow, refit the server cover before you turn the power on. Do not operate the server for more than 30 minutes with the server cover removed, for it might damage server components.
- Cabling instructions that come with optional components must be followed.
- A failed fan must be replaced within 48 hours after malfunction.
- A removed hot-swap fan must be replaced within 30 seconds after removal.
- A removed hot-swap drive must be replaced within two minutes after removal.

- A removed hot-swap power supply must be replaced within two minutes after removal.
- Every air baffle that comes with the server must be installed when the server starts (some servers might come with more than one air baffle). Operating the server with a missing air baffle might damage the processor.
- All processor sockets must contain either a socket cover or a processor with heat sink.
- When more than one processor is installed, fan population rules for each server must be strictly followed.

Handling static-sensitive devices

Review these guidelines before you handle static-sensitive devices to reduce the possibility of damage from electrostatic discharge.

Attention: Prevent exposure to static electricity, which might lead to system halt and loss of data, by keeping static-sensitive components in their static-protective packages until installation, and handling these devices with an electrostatic-discharge wrist strap or other grounding system.

- Limit your movement to prevent building up static electricity around you.
- Take additional care when handling devices during cold weather, for heating would reduce indoor humidity and increase static electricity.
- Always use an electrostatic-discharge wrist strap or other grounding system, particularly when working inside the server with the power on.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the server for at least two seconds. This drains static electricity from the package and from your body.
- Remove the device from the package and install it directly into the server without putting it down. If it is necessary to put the device down, put it back into the static-protective package. Never place the device on the server or on any metal surface.
- When handling a device, carefully hold it by the edges or the frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Keep the device from others' reach to prevent possible damages.

Memory module installation rules and order

Memory modules must be installed in a specific order based on the memory configuration that you implement on your node.

For information on the types of memory module supported by this server, see "Memory section in Technical Specifications" on page .

The following memory configurations are available:

- Independent memory mode
- Mirroring mode

Information about optimizing memory performance and configuring memory is available at the Lenovo Press website:

https://lenovopress.lenovo.com/servers/options/memory

In addition, you can take advantage of a memory configurator, which is available at the following site:

https://dcsc.lenovo.com/#/memory_configuration

Specific information about the required installation order of memory modules in your solution based on the system configuration and memory mode that you are implementing is shown below.

Memory modules and processors layout

Figure 19. Memory modules and processors layout

The memory-channel configuration table below shows the relationship between the processors, memory channels, and memory module slot numbers.

Table 15. Channel and slot information of DIMMs around a processor

CPU	**CPU 1**											
iMC	11	10	9	8	7	6	0	1	2	3	4	5
Memory channel	11	10	9	8	7	6	0	1	2	3	4	5
DIMM slot number	1	2	3	4	5	6	7	8	9	10	11	12
CPU	**CPU 2**											
iMC	5	4	3	2	1	0	6	7	8	9	10	11
Memory channel	5	4	3	2	1	0	6	7	8	9	10	11
DIMM slot number	13	14	15	16	17	18	19	20	21	22	23	24

DRAM DIMMs installation order

This section contains information of how to install DRAM DIMMs properly.

Independent memory mode installation order

In independent memory mode, memory channels can be populated with DIMMs in any order and you can populate all channels for each processor in any order with no matching requirements. Independent memory mode provides the highest level of memory performance, but lacks failover protection. The DIMM installation order for independent memory mode varies based on the number of processors and memory modules installed in the server.

Independent memory mode guidelines:

- Individual memory channels can run at different DIMM timings, but all channels must run at the same interface frequency.
- Populate memory channel 0 first.
- In each memory channel, populate slot 0 first.
- Memory channel 1 is empty or identically populated as memory channel 0.
- Memory channel 2 is empty or identically populated as memory channel 1.
- If a memory channel has two DIMMs, populate the DIMM with a higher number of ranks in slot 0.
- Mixing DIMMs with different capacity is not allowed. All DIMMs installed must be identical.

Independent mode population sequence

SC750 V4 supports fully populated processors only (two processors per node).

Table 16. Independent mode population sequence

CPU	**CPU 1**											
iMC	11	10	9	8	7	6	0	1	2	3	4	5
Memory channel	11	10	9	8	7	6	0	1	2	3	4	5
DIMM slot number	1	2	3	4	5	6	7	8	9	10	11	12
CPU	**CPU 2**											
iMC	5	4	3	2	1	0	6	7	8	9	10	11
Memory channel	5	4	3	2	1	0	6	7	8	9	10	11
DIMM slot number	13	14	15	16	17	18	19	20	21	22	23	24

Notes:

- Sub NUMA Clustering 3 (SNC3) is supported and can be enabled in UEFI.
- Software Guard Extensions (SGX) is supported. See "Enable Software Guard Extensions (SGX)" on page 432 to enable this feature.

Mirroring mode installation order

Memory-mirroring mode provides full memory redundancy while reducing the total system memory capacity in half. Memory channels are grouped in pairs with each channel receiving the same data. If a failure occurs, the memory controller switches from the DIMMs on the primary channel to the DIMMs on the backup channel. The DIMM installation order for memory mirroring varies based on the number of processors and DIMMs installed in the server.

Memory mirroring guidelines:

- Memory mirroring reduces the maximum available memory by half of the installed memory. For example, if the server has 64 GB of installed memory, only 32 GB of addressable memory is available when memory mirroring is enabled.
- Mixing DIMMs with different capacity is not allowed. All DIMMs installed must be identical in capacity, density, architecture,
- Mirroring is supported inside a cluster between two memory controllers. Mirroring is across adjacent memory controllers, that is, IMC 0 and 1, 2 and 3, and so forth.
  - Mirroring across IMC 1 and 2 is not supported for example.
  - BIOS should configure one as the primary and the other as the secondary.
- Mirrored regions need to be of identical memory densities and capacities.
- Mirroring is supported in 1LM.
- Mirroring is within a pair of channels. Three-channel mirroring is not supported.
- Partial Memory Mirroring is a sub-function of memory mirroring. It requires following the memory installation order of memory mirroring mode.

Mirroring mode population sequence

SC750 V4 supports fully populated processors only (two processors per node)

Table 17. Mirroring mode population sequence

CPU	**CPU 1**											
iMC	11	10	9	8	7	6	0	1	2	3	4	5
Memory channel	11	10	9	8	7	6	0	1	2	3	4	5
DIMM slot number	1	2	3	4	5	6	7	8	9	10	11	12
CPU	**CPU 2**											
iMC	5	4	3	2	1	0	6	7	8	9	10	11
Memory channel	5	4	3	2	1	0	6	7	8	9	10	11
DIMM slot number	13	14	15	16	17	18	19	20	21	22	23	24

Notes:

- Sub NUMA Clustering 3 (SNC3) is supported and can be enabled in UEFI.
- Software Guard Extensions (SGX) is supported. See "Enable Software Guard Extensions (SGX)" on page 432 to enable this feature.

Gap pad identification and location

Follow the information in this section to identify shape, location, replacing scenarios, and instruction on the gap pads used in SC750 V4.

Installation guidelines for gap pads used in SC750 V4

See the following for gap pads and putty pads used in SC750 V4:

- "Water loop gap pads" on page 41
- "VR cold plate gap pads" on page 43
- "ConnectX-7 NDR adapter gap pads" on page 44
- "ConnectX-8 adapter gap pads" on page 44
- "OPA 400 adapter gap pads" on page 45
- "E3.S drive gap pads" on page 46

Water loop gap pads

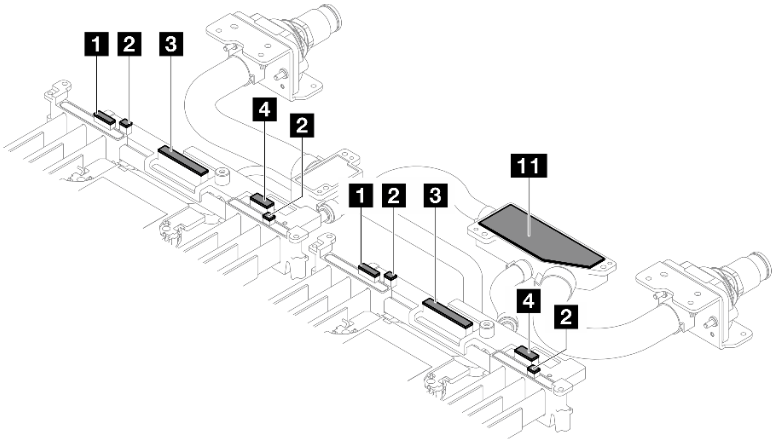


Figure 20. Gap pads on the rear end of the water loop

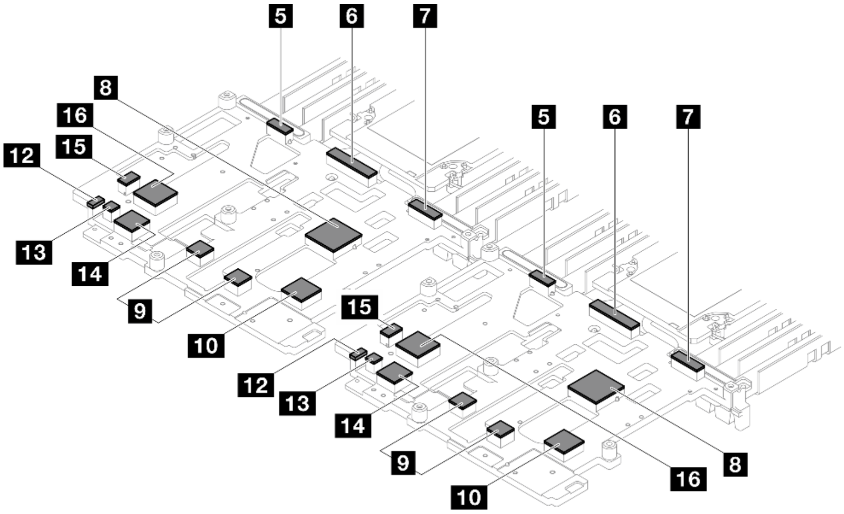


Figure 21. Gap pads on the front end of the water loop

Table 18. Water loop gap pads

Pad number	Component installation requiring the pads	Scenario requiring pad replacing	Pad attaching location	Pad attaching instructions
1, 2, 3, 4	• “Install a processor” on page 272 • “Install the water loop” on page 395	Replace the pad when the pad on water loop is damaged or detached.	Rear end of the water loop	1. Peel of blue or transparent plastic film on the pad, and attach this side to the water loop. 2. After the pad is attached to water loop, remove the other plastic film from the pad.
11		Replace the pad when the pad on water loop is damaged or detached.	Mixing chamber on the rear end of the water loop	1. Keep the yellow side facing up, peel of the plastic film from the bottom side. 2. Keep the yellow side facing up, and attach the pad to the mixing chamber.
5, 6, 7, 8, 9 10, 12, 13, 14, 15		Replace the pad when the pad on water loop is damaged or detached.	Front end of the water loop	1. Peel of blue or transparent plastic film on the pad, and attach this side to the water loop. 2. After the pad is attached to water loop, remove the other plastic film from the pad.

VR cold plate gap pads

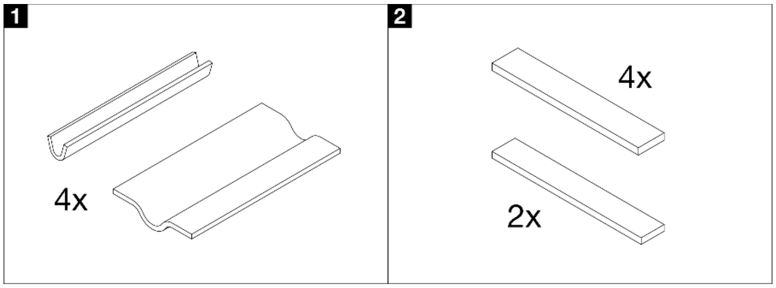


Figure 22. VR cold plate gap pads

Table 19. VR cold plate gap pads

Pad number	Component installation requiring the pads	Scenario requiring pad replacing	Pad attaching location	Pad attaching instructions
1	• "Install a processor" on page 272 • "Install the water loop" on page 395 • "Install the processor board" on page 289	Replace the pad when the pad on VR cold plate is damaged or detached.	Top side of the VR cold plate	Peel off the transparent plastic film on the pad, and attach this side to the cold plate.
2		**Single-use gap pad** Replace the pads whenever the VR cold plate is removed.	Bottom side of the VR cold plate	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.

ConnectX-7 NDR adapter gap pads

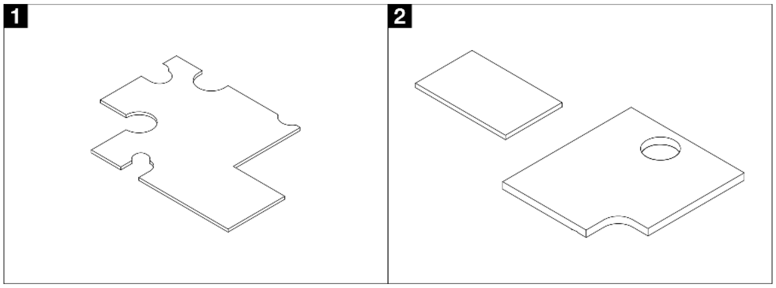


Figure 23. ConnectX-7 NDR adapter gap pads

Table 20. ConnectX-7 NDR adapter gap pads

Pad number	Component installation requiring the pads	Scenario requiring pad replacing	Pad attaching location	Pad attaching instructions
1	"Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.	**Single-use gap pad** Replace the pads whenever the ConnectX-7 NDR 400 riser assembly is removed.	ConnectX-7 NDR 400 interface plate	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.
2	"Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77.	**Single-use gap pad** Replace the pads whenever the ConnectX-7 NDR 200 riser assembly is removed.	ConnectX-7 NDR 200 interface plate	

ConnectX-8 adapter gap pads

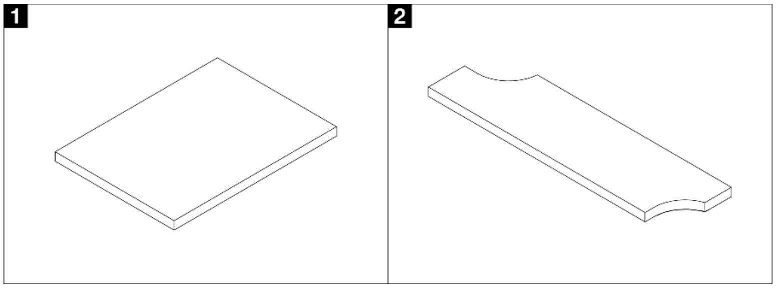


Figure 24. ConnectX-8 adapter gap pads

Table 21. ConnectX-8 adapter gap pads

Pad number	Component installation requiring the pads	Scenario requiring pad replacing	Pad attaching location	Pad attaching instructions
1	"Install a ConnectX-8 adapter riser assembly" on page 101.	**Single-use gap pad** Replace the pads whenever the ConnectX-8 riser assembly is removed.	ConnectX-8 interface plate	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.
2		**Single-use gap pad** Replace the pads whenever the ConnectX-8 riser assembly is removed.	ConnectX-8 interface plate	

OPA 400 adapter gap pads

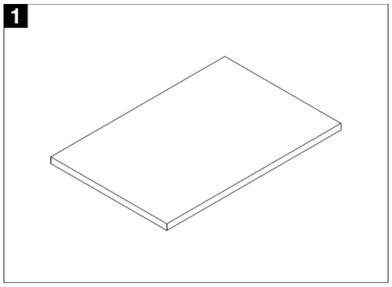


Figure 25. OPA 400 adapter gap pad

Table 22. OPA 400 adapter gap pads

Pad number	Component installation requiring the pads	Scenario requiring pad replacing	Pad attaching location	Pad attaching instructions
1	"Install an OPA 400 adapter riser assembly" on page 241.	**Single-use gap pad** Replace the pads whenever the OPA 400 riser assembly is removed.	OPA 400 interface plate	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.

E3.S drive gap pads

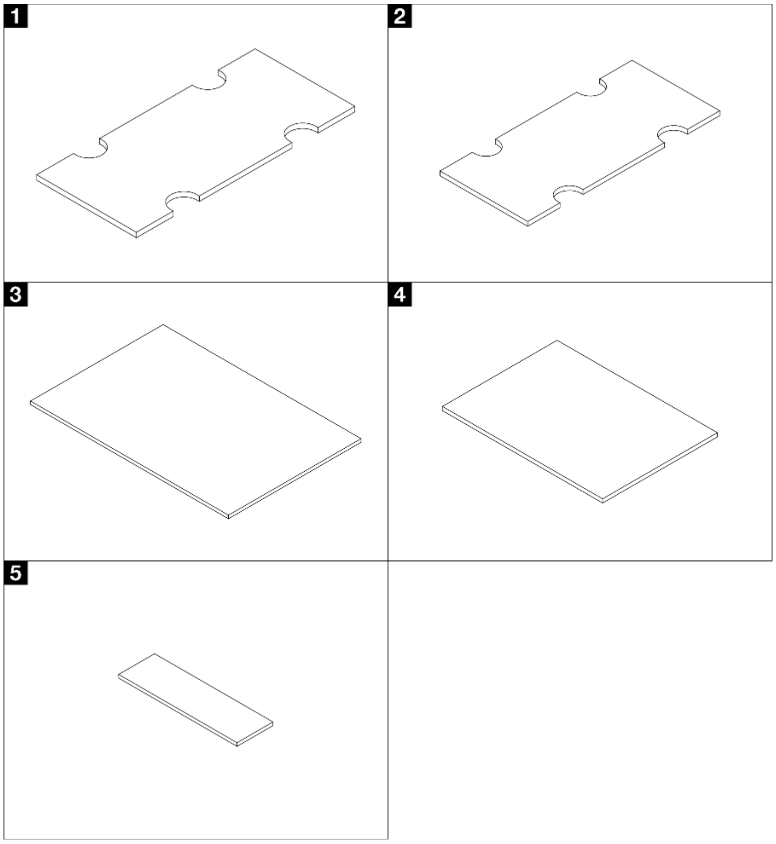


Table 23. E3.S drive gap pads

Pad number	**Component installation requiring the pads**	**Pad attaching location**	**Pad replacing scenario**	**Pad attaching instructions**
1	• "Install an E3.S 1T middle drive cage assembly" on page 161 • "Install a processor" on page 272 • "Install the water loop" on page 395	Top side of the E3.S middle cold plate	Replace the pad when the pad on the E3.S middle cold plate is damaged or detached	1. Peel off blue or transparent plastic film on the pad, and attach this side to the cold plate. 2. After the pad is attached to cold plate, remove the other plastic film from the pad.
2	• "Install a processor" on page 272 • "Install the water loop" on page 395	Bottom side of the E3.S middle cold plate	**Single-use gap pad** Replace the pad whenever the E3.S middle cold plate is removed.	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.
3	• "Install E3.S 1T dual front drive" on page 140 • "Install an E3.S 2T single front drive" on page 152	E3.S drive heat sink	Replace the pad when the pad on the E3.S drive heat sink is damaged or detached.	1. Keep the yellow side facing up, peel of the plastic film from the bottom side. 2. Keep the yellow side facing up, and attach the pad to the E3.S drive heat sink.

Table 23. E3.S drive gap pads (continued)

Pad number	Component installation requiring the pads	Pad attaching location	Pad replacing scenario	Pad attaching instructions
4	"Install an E3.S front drive cage assembly" on page 124	Water loop	Replace the pad when the pad on the water loop is damaged or detached.	1. Keep the yellow side facing up, peel of the plastic film from the bottom side. 2. Keep the yellow side facing up, and attach the pad to the water loop.
5	"Install an E3.S front drive cage assembly" on page 124	Water loop	**Single-use gap pad** Replace the pads whenever the E3.S front drive cage is removed.	1. There are two plastic films on the pad, one is transparent, the other has printing on it. 2. Peel off the transparent plastic film, and attach this side to the cold plate. 3. Peel off the other plastic film.

Power on and power off the solution

Follow the instructions in this section to power on and power off the solution.

Power on the solution

After the solution performs a short self-test (power status LED flashes quickly) when connected to input power, it enters a standby state (power status LED flashes once per second).

Power button location and power LED are specified in "Troubleshooting by system LEDs and diagnostics display" on page 439.

The solution can be turned on (power LED on) in any of the following ways:

- You can press the power button.
- The solution can restart automatically after a power interruption.
- The solution can respond to remote power-on requests sent to the Lenovo XClarity Controller.

For information about powering off the solution, see "Power off the solution" on page 48.

Power off the solution

The solution remains in a standby state when it is connected to a power source, allowing the Lenovo XClarity Controller to respond to remote power-on requests. To remove all power from the solution (power status LED off), you must disconnect all power cables.

Power button location and power LED are specified in “Troubleshooting by system LEDs and diagnostics display” on page 439.

To place the solution in a standby state (power status LED flashes once per second):

Note: The Lenovo XClarity Controller can place the solution in a standby state as an automatic response to a critical system failure.

- Start an orderly shutdown using the operating system (if supported by your operating system).
- Press the power button to start an orderly shutdown (if supported by your operating system).
- Press and hold the power button for more than 4 seconds to force a shutdown.

When in a standby state, the solution can respond to remote power-on requests sent to the Lenovo XClarity Controller. For information about powering on the solution, see “Power on the solution” on page 48.

Setting up the lift tool assembly

Use this information to set up the lift tool assembly, which is a mandatory tool for tray and PCS removal and installation.

About this task

Setting up the lift tool assembly requires the followings items:

- Genie GL-8 lift tool and foot-release brake included in the “Genie Lift GL-8 Option Kit”. The foot-release brake should be attached to the lift tool.
- Lift tool fixture included in the “GL-8 Kit for N1380 and SC Systems”

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Push down the foot pedal to lock the wheel brake of the lift tool.

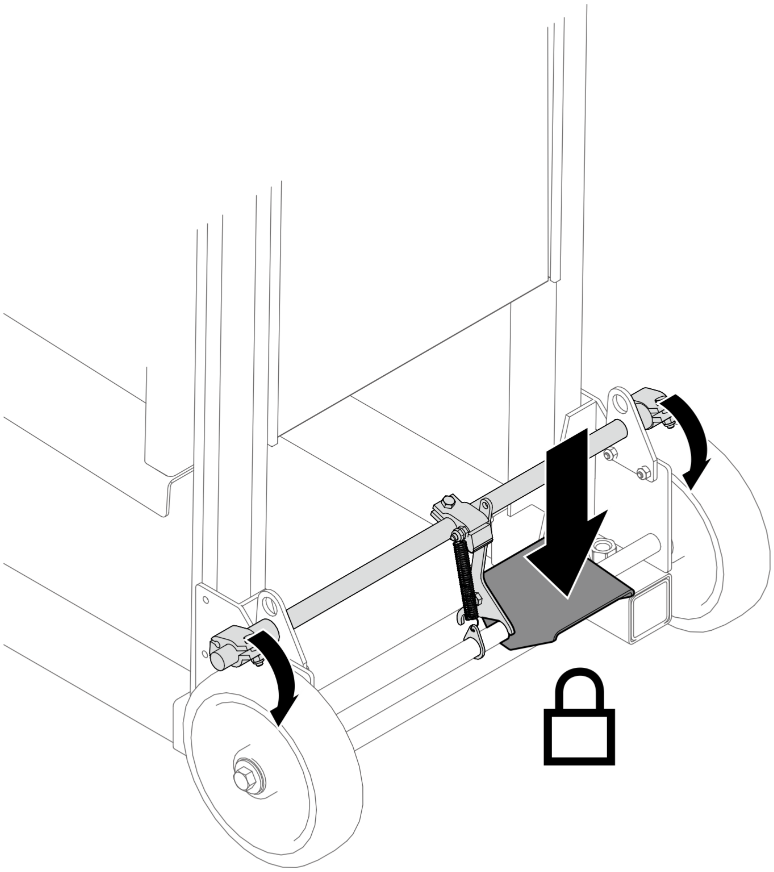


Figure 26. Locking the lift tool wheel brake

Step 2. If necessary, remove the load platform from the lift tool.

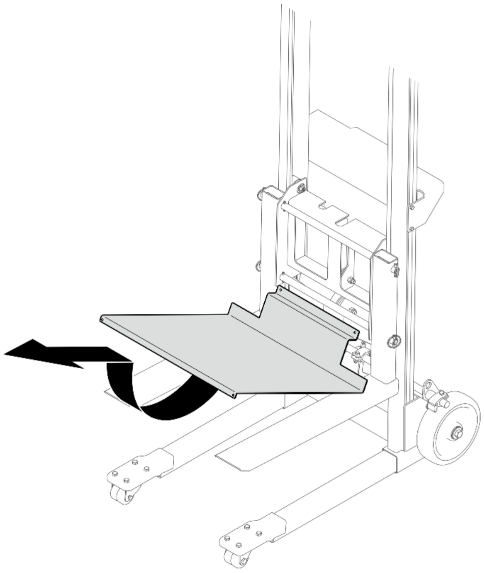


Figure 27. Removing the load platform

Note: When the load platform or the lift tool fixture is not in use, store it in the rotate fixture cart.

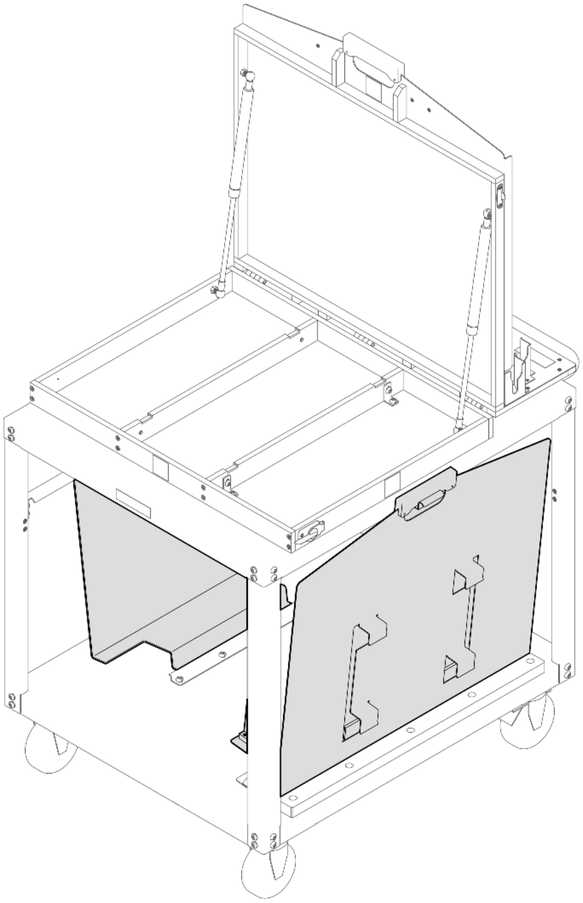


Figure 28. Storing load platform and lift tool fixture in the cart

Step 3. There are four hooks on the back of the lift tool fixture. Align the hooks with the parallel bars on the lift tool, and lock the hooks to the bars to secure the lift tool fixture onto the lift tool.

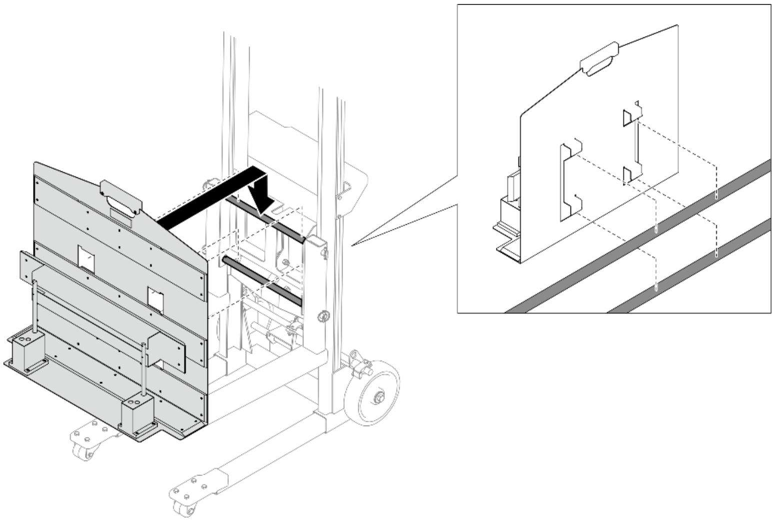


Figure 29. Securing the lift tool fixture onto the lift tool

Step 4. The fixture is properly secured if the parallel bars are visible through the hook openings and the base is sitting on the fork.

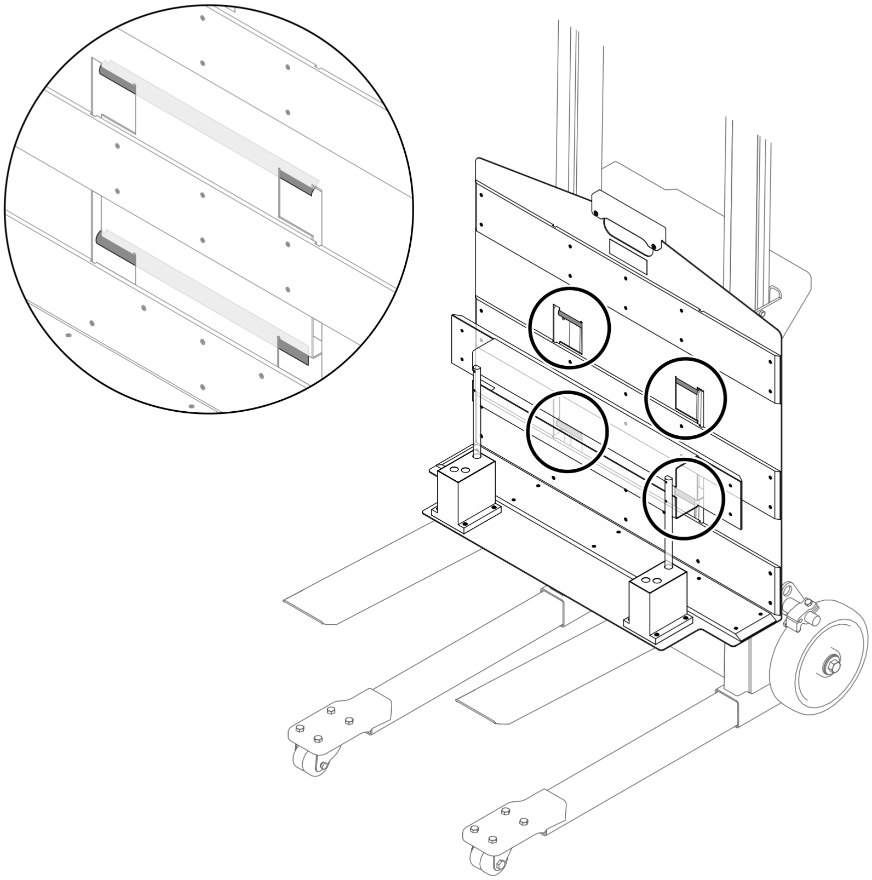


Figure 30. lift tool fixture proper installation

After you finish

Proceed to removing or installing tray or PCS.

Setting up the rotate fixture cart assembly

Use this information to set up the rotate fixture cart assembly, which is a mandatory tool for tray removal and installation.

About this task

Setting up the rotate fixture cart assembly requires the following items:
- Rotate fixture included in the “GL-8 Kit for N1380 and SC Systems”
- Rotate fixture customized cart

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Lock the cart wheel brakes

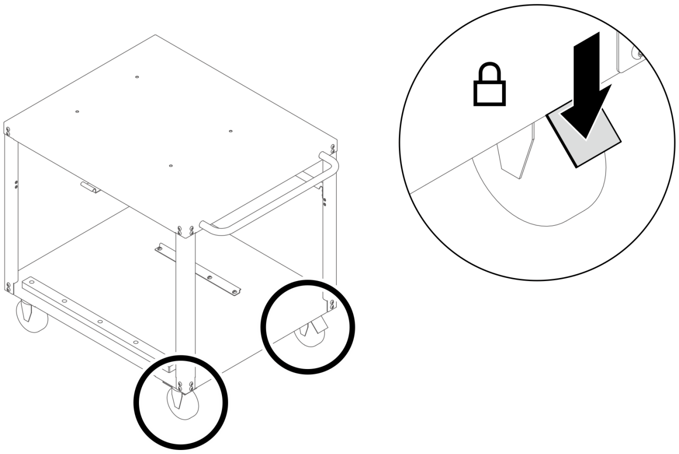


Figure 31. Locking the cart wheel brakes

Step 2. Open the rotate fixture.

a. ① Grab the handle, and hold the handle down with extra force.

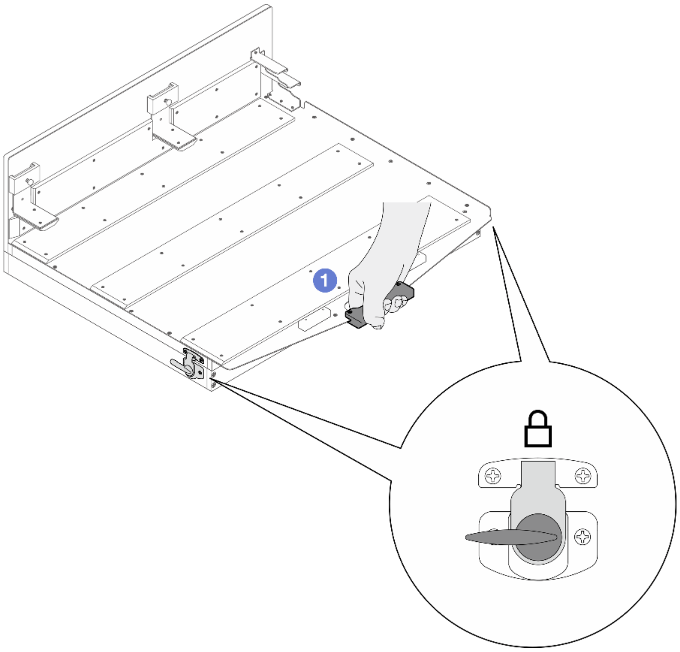


Figure 32. Holding down the rotate fixture handle

b. ② **Keep holding down the handle.** Meanwhile, rotate the latch counterclockwise until it is unlocked. Make sure to unlock the latches on the right and left sides of the fixture.

Attention: Make sure you are holding down the handle while unlocking the latches.

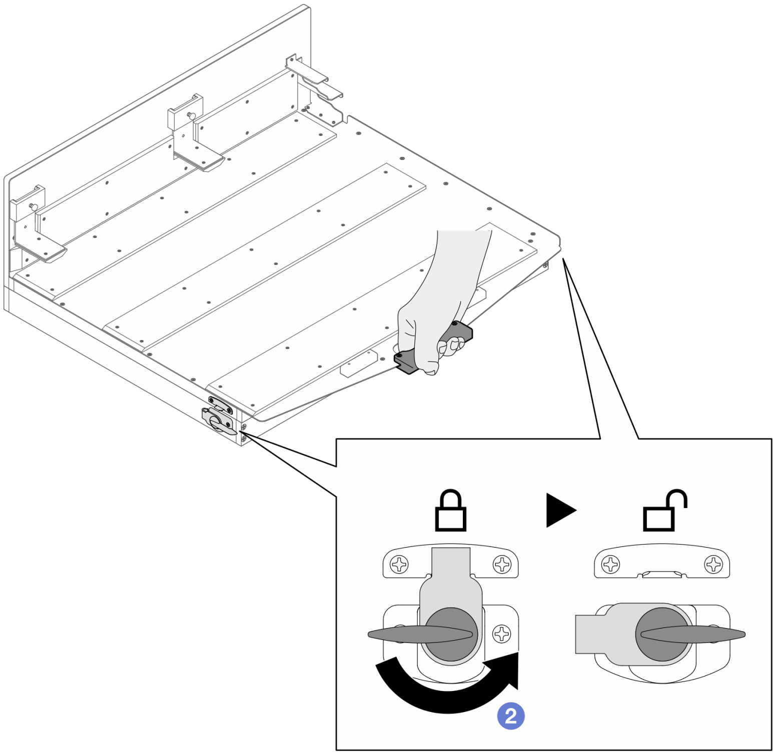


Figure 33. Unlock the rotate fixture latches

c. ③ **Hold the handle;** then, slowly rotate it upward until it stands vertically.

Attention: Make sure you are holding the handle while opening the rotate fixture.

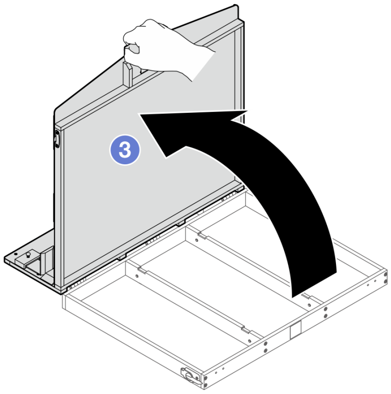


Figure 34. Open the rotate fixture

Step 3. Install screws to attach four L-shape retainer to the support bars of the rotate fixture (two retainers per support bar).

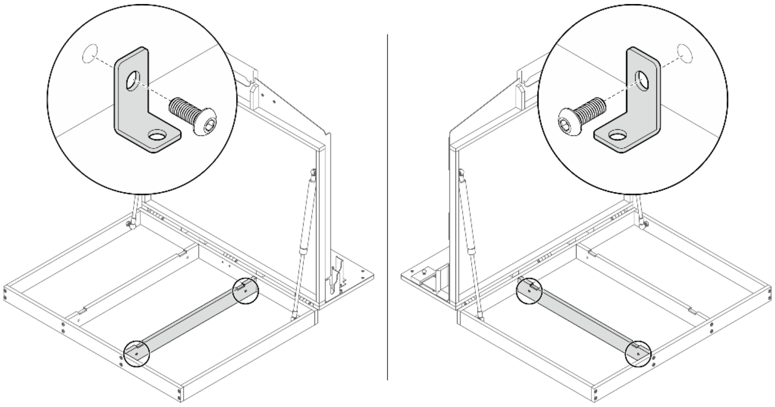


Figure 35. Installing L-shape retainers to the rotate fixture

Step 4. Align the screw holes on the L-shape retainer to the screw holes on the cart top; then, place the rotate fixture on the cart.

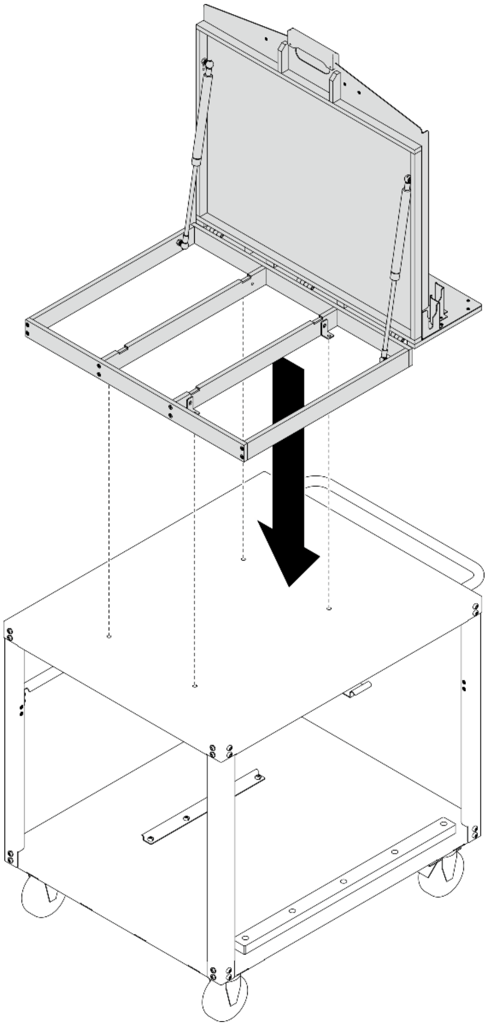


Figure 36. Placing the rotate fixture on the cart

Step 5. Install four screws to secure the rotate fixture to the cart top.

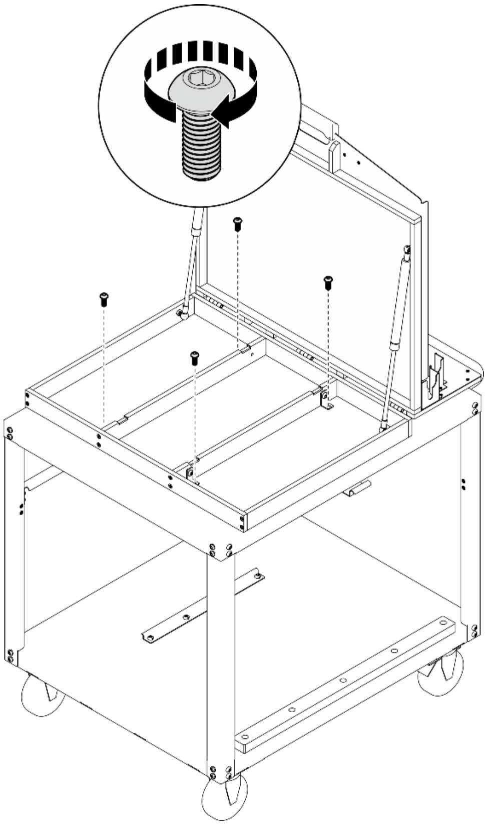


Figure 37. Installing the rotate fixture to the cart

After you finish

Proceed to removing or installing tray.

Replace components in the tray (Trained technician only)

Use the following information to remove and install tray components.

Bus bar connector module replacement (trained technician only)

Use the following procedures to remove and install the bus bar connector module.

Remove the bus bar connector module

Use this information to remove the bus bar connector module.

About this task

Required tools

- Screwdriver for PH1 and PH 2 screws

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.

- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- The following illustration might differ slightly from your hardware, but the removal method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove 16x PH1 screws to remove the rear cross brace.

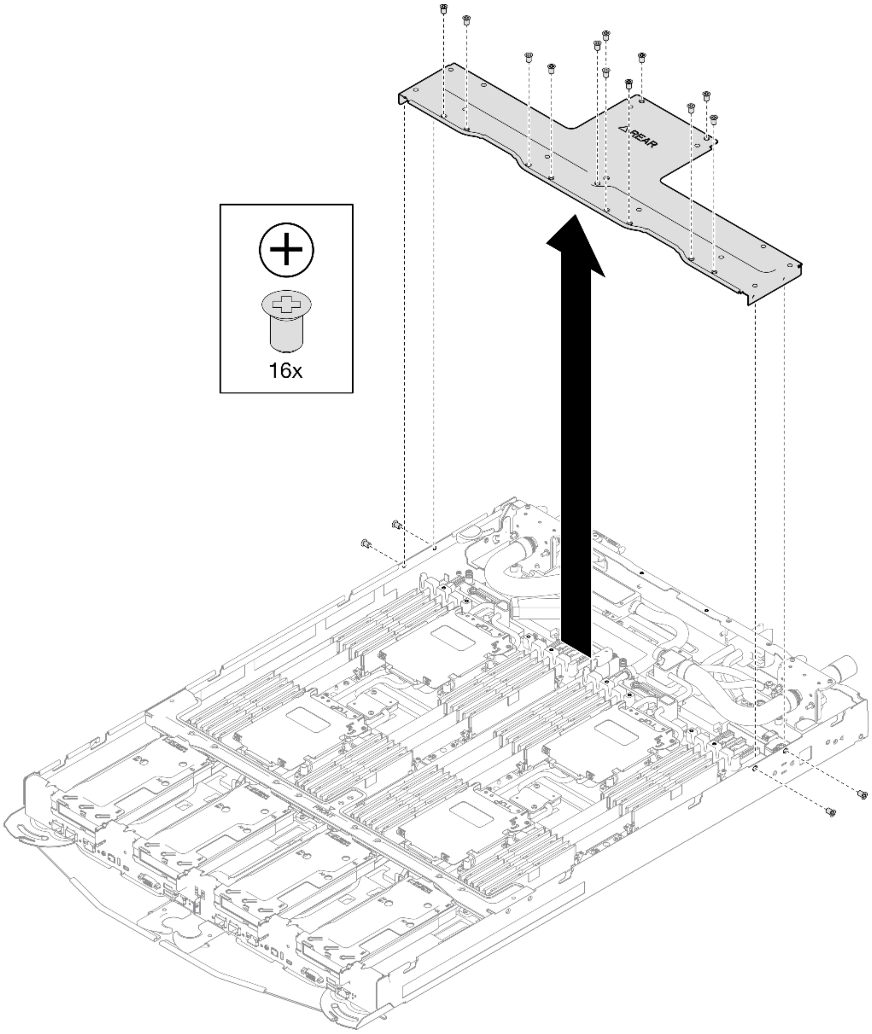


Figure 38. Removing the rear cross brace

Step 3. Disconnect the sideband cable that has P3 marked on its plugger from the PDB.

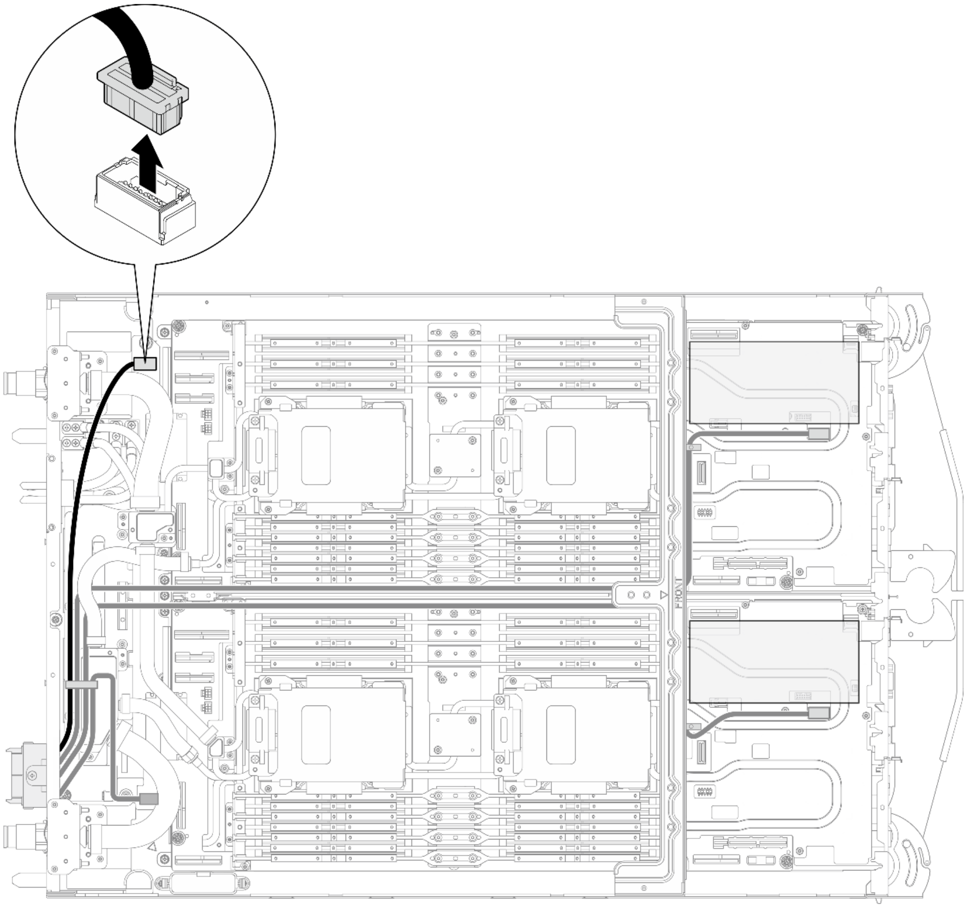


Figure 39. Disconnect the P3 sideband cable

Step 4. Remove the bus bar connector module.

a. ❶ Remove four PH2 screws from ground cables (black cables), with a torque screwdriver set to the proper torque.

b. ❷ Remove four PH2 screws from power cables (red cables), with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 7+/-1.0 lbf-in.

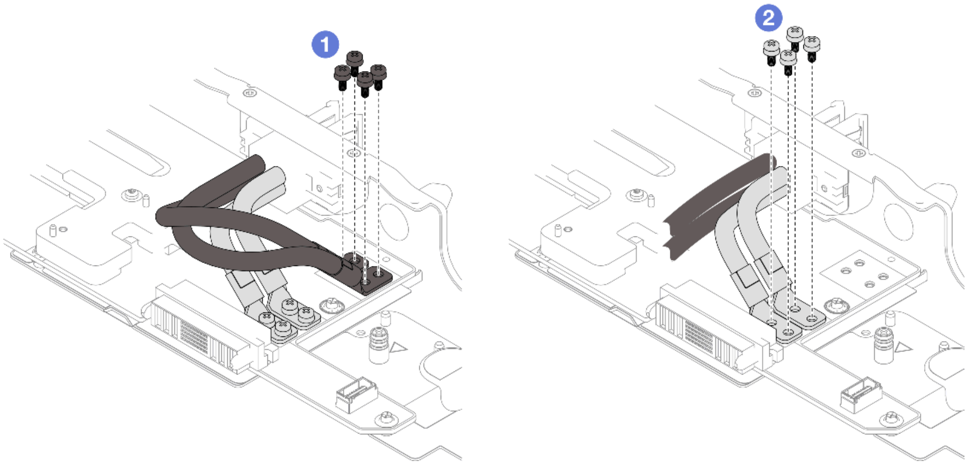


Figure 40. Disconnecting the bus bar connector module

c. ③ Remove threw PH1 screws from the tray rear bezel.

d. ④ Remove the bus bar connector module.

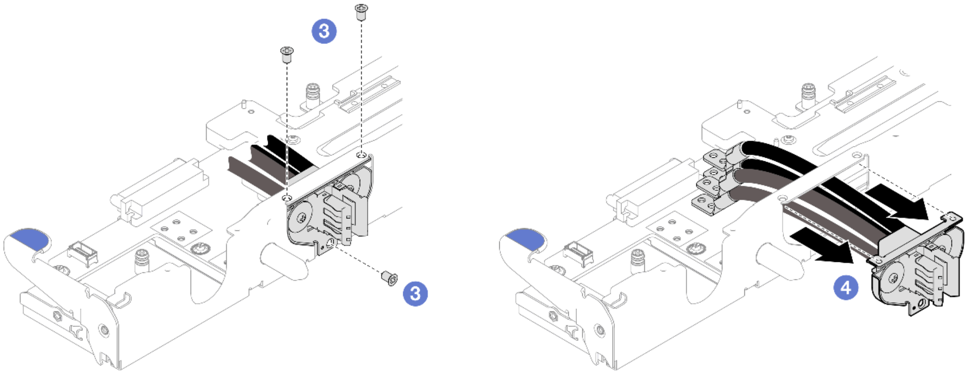


Figure 41. Removing the bus bar connector module

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the bus bar connector module

Use this information to install the bus bar connector module.

About this task

Required tools
- Screwdriver for PH1 and PH 2 screws

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install the bus bar connector module.

a. ① Install the bus bar connector module to the tray rear bezel.

b. ② Install three PH1 screws on the rear tray bezel.

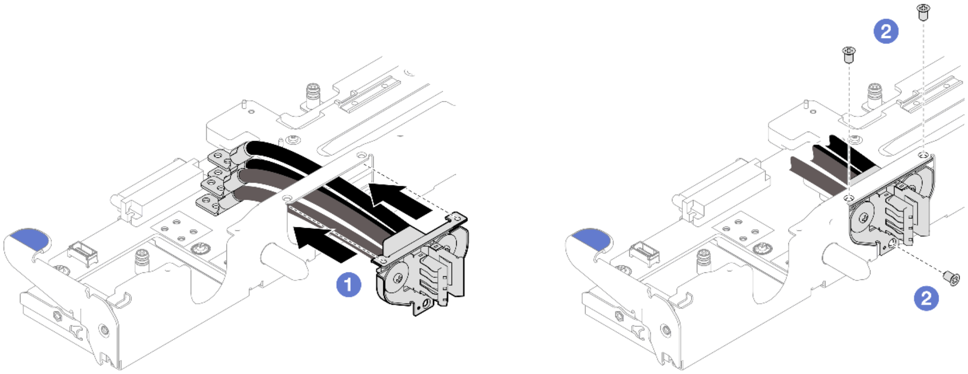


Figure 42. Installing the bus bar connector module

c. ③ Take the cables labeled as **PWR** and connect them to the power pad marked as **PWR**. Install four PH2 screws to secure the cables to the PIB, with a torque screwdriver set to the proper torque.

d. ④ Take the cables labeled as **GND** and connect them to the ground pad marked as **GND**. Install four PH2 screws to secure the cables to the PIB, with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 7+/- 1.0 lbf-in.

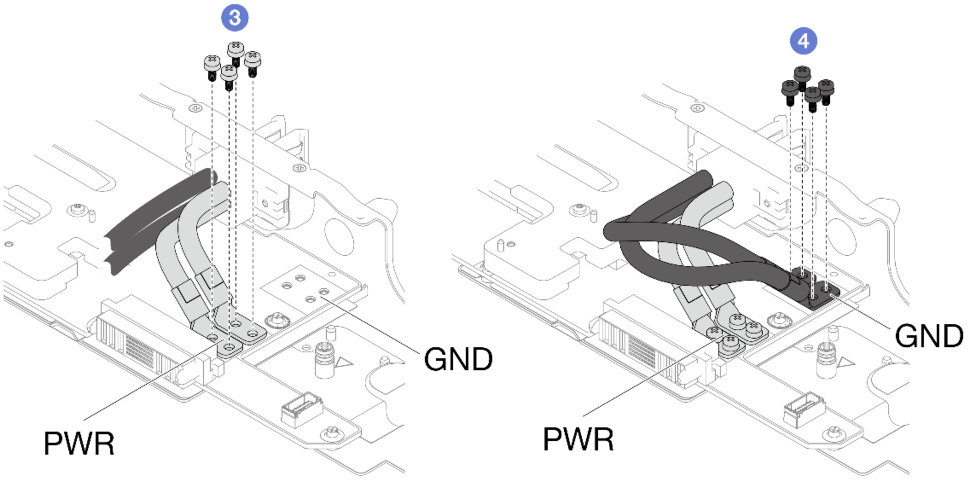


Figure 43. Connecting the bus bar connector module

Step 2. Place one **GND** cable under the water loop tube, the other **GND** cable between the tube and the **PWR** cables, as the illustration below.

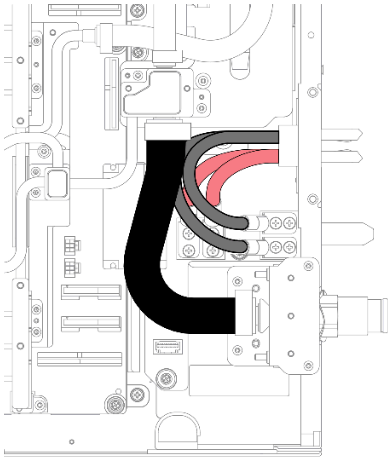


Figure 44. GND cable arrangement

Step 3. Connect the sideband cable that has P3 marked on its plugger to the PDB.

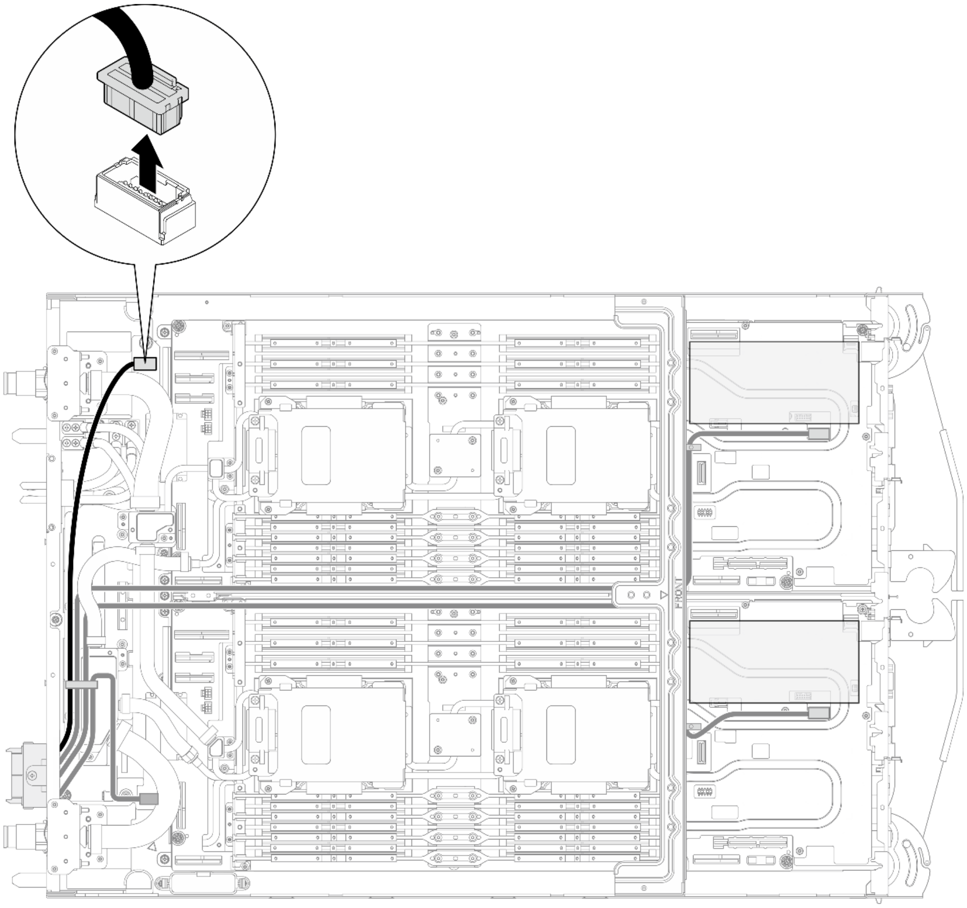


Figure 45. Connecting the P3 sideband cable

Step 4. Place the rear cross brace on the tray.

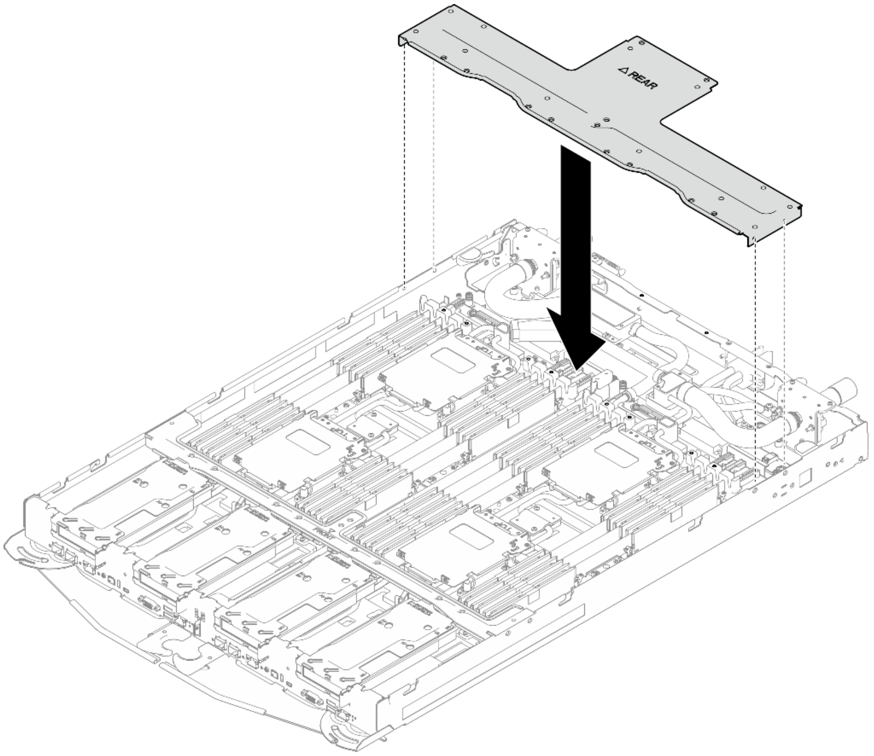


Figure 46. Placing rear cross brace on the tray

Step 5. Install the rear cross braces to the tray.

a. Install ten (10x) PH1 screws to secure the rear cross brace.

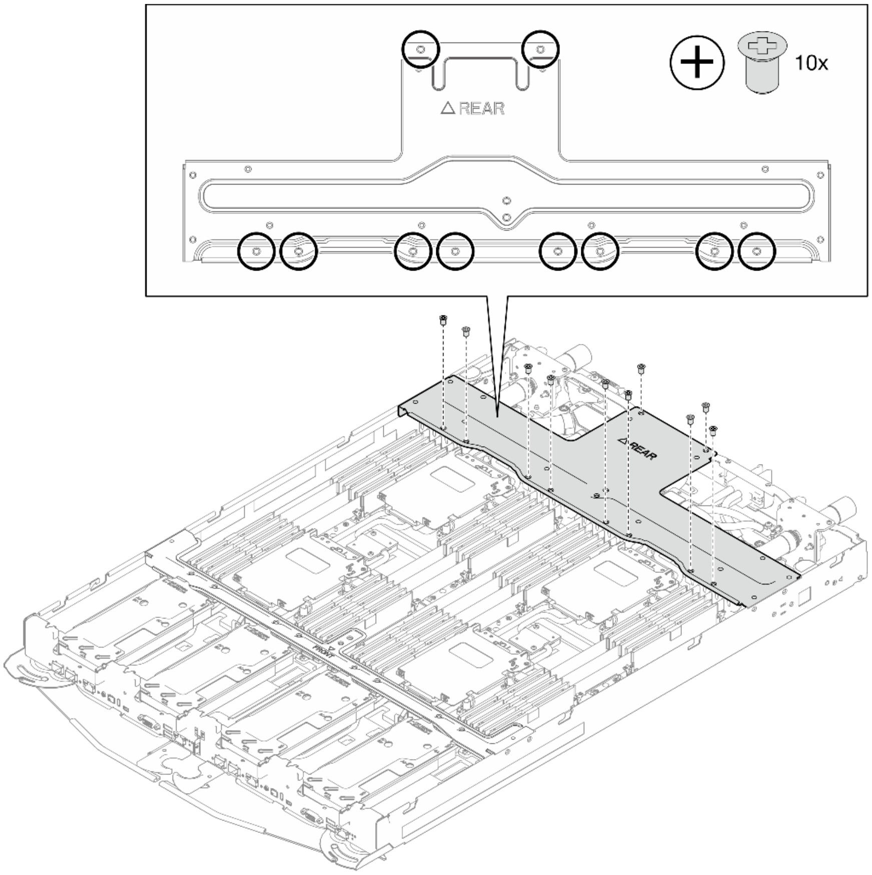


Figure 47. Installing screws to the rear cross brace (10x)

b. Fasten six (6x) PH1 screws to install the cross braces.

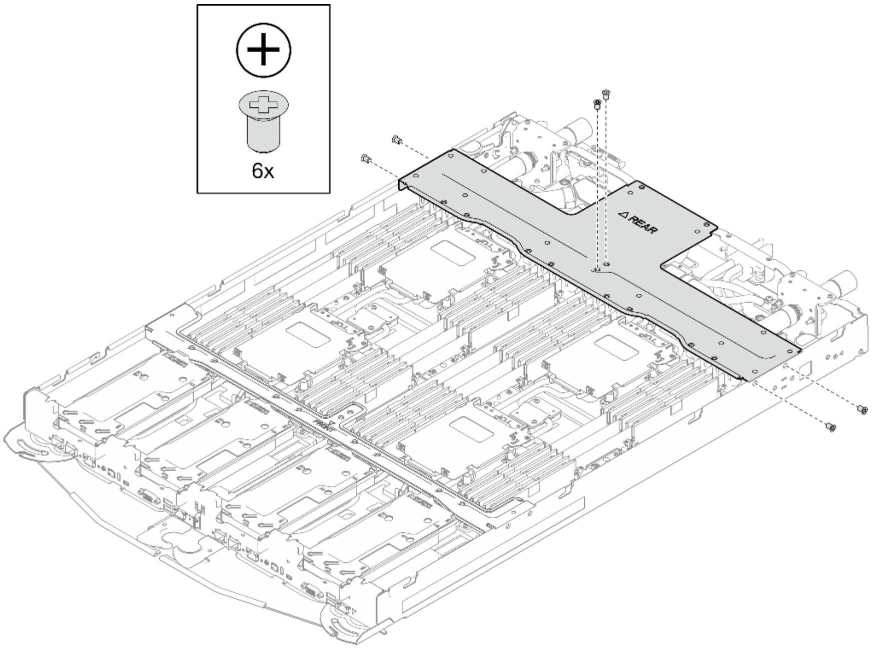


Figure 48. Installing screws to the rear cross brace (6x)

After you finish

1. Install the tray cover. See "Install the tray cover" on page 373.
2. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

CMOS battery (CR2032) replacement

Use the following procedures to remove and install the CMOS battery (CR2032).

Remove the CMOS battery (CR2032)

Use this information to remove the CMOS battery.

About this task

To avoid possible danger, read and follow the following safety statement.

- S004

  ⚠

  CAUTION:
  When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

  Do not:

  - **Throw or immerse into water**
  - **Heat to more than 100°C (212°F)**
  - **Repair or disassemble**

  Dispose of the battery as required by local ordinances or regulations.

- S005

  ⚠

  CAUTION:
  The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- The following notes describe information that you must consider when replacing the battery.
  - Lenovo has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.
  - If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
  - After you replace the battery, you must reconfigure the solution and reset the system date and time.

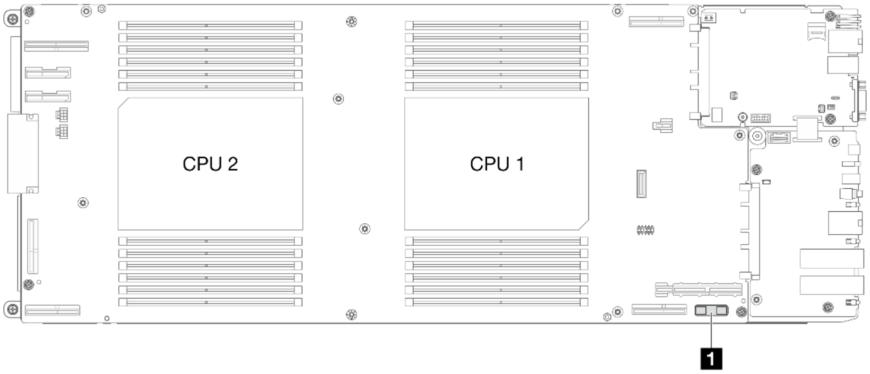


Figure 49. CMOS battery location

Table 24. CMOS battery location

1 CMOS battery

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

Step 2. Remove the CMOS battery:

Attention: Do not lift the battery by using excessive force. Failing to remove the battery properly may damage the socket on the system board. Any damage to the socket may require replacing the system board.

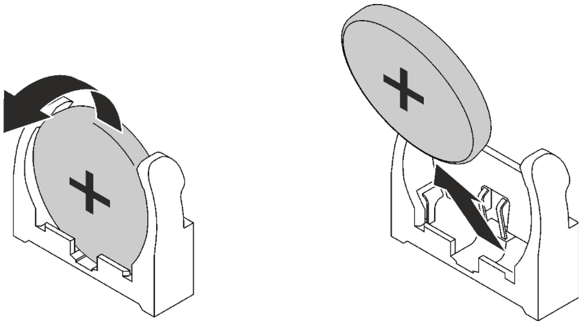


Figure 50. CMOS battery removal

a. Pivot the battery toward the middle of the compute node.

b. Lift the battery from the socket.

Step 3. Dispose of the CMOS battery as required by local ordinances or regulations.

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the CMOS battery (CR2032)

Use this information to install the CMOS battery.

About this task

To avoid possible danger, read and follow the following safety statement.

- **S004**

  CAUTION:
  When replacing the lithium battery, use only Lenovo specified part number or an equivalent type of battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

  Do not:

  - **Throw or immerse into water**
  - **Heat to more than 100°C (212°F)**
  - **Repair or disassemble**

  Dispose of the battery as required by local ordinances or regulations.

- **S005**

CAUTION:
The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the approved part. Recycle or discard the battery as instructed by local regulations.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- The following notes describe information that you must consider when replacing the system battery in the node.
  - When replacing the system battery, you must replace it with a lithium battery of the same type from the same manufacturer.
  - After you replace the system-board battery, you must reconfigure the node and reset the system date and time.

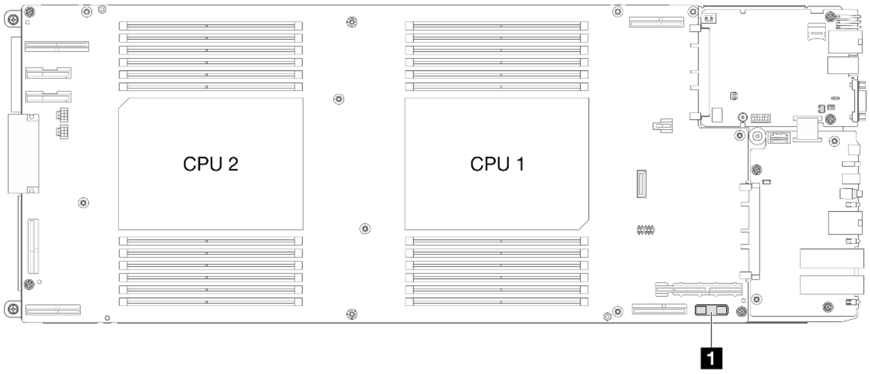


Figure 51. CMOS battery location

Table 25. CMOS battery location

1 CMOS battery

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Follow any special handling and installation instructions that come with the CMOS battery.

Step 2. Insert the new CMOS battery:

a. Face the positive (+) symbol to the center of the node; then, place the battery into the seat until it clicks in place.

b. As you slide the CMOS battery into place, press the top of the CMOS battery into the socket. Make sure that the battery clip holds the battery securely.

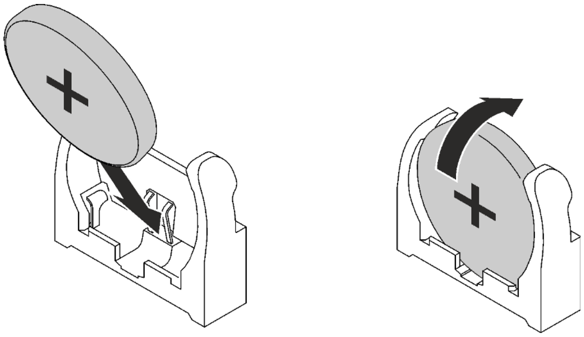


Figure 52. CMOS battery installation

After you finish

1. Install the cross braces. See "Install the cross braces" on page 109.
2. Install the tray cover. See "Install the tray cover" on page 373.
3. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
4. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
5. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

ConnectX-7 NDR 200 adapter riser assembly replacement

Use the following procedures to remove and install a ConnectX-7 NDR 200 adapter riser assembly.

Remove a ConnectX-7 NDR 200 adapter riser assembly

Use this information to remove a ConnectX-7 NDR 200 adapter riser assembly.

About this task

Required tools
- Screwdriver for T10 and PH1 screws
- Waterloop Miscellaneous Kit (SC750 V4) .
- CX7 NDR200 Gap Pad (SC750 V4)
- CX7 NDR200 Conduction Plate (if installing ConnectX-7 NDR 200 for the first time)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

d. For shared I/O or socket direct configurations, disconnect the cable from the system board. See ***Internal Cable Routing Guide***.

Step 2. Loosen the captive screw on the clamp bracket and remove it. Remove the screw from the front of the riser assembly.

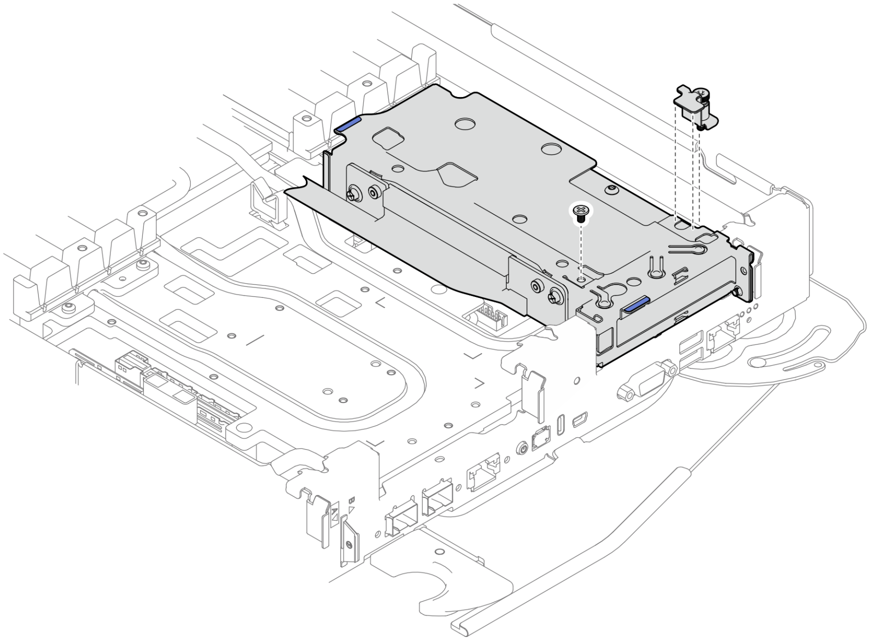


Figure 53. Removing clamp and screw from the riser assembly

Step 3. Loosen the ConnectX-7 NDR 200 riser assembly from the water loop.

a. ① Loosen the captive screw on the riser assembly.

b. ② Remove three T10 screws from the screw holes marked with **B** on the riser cage.

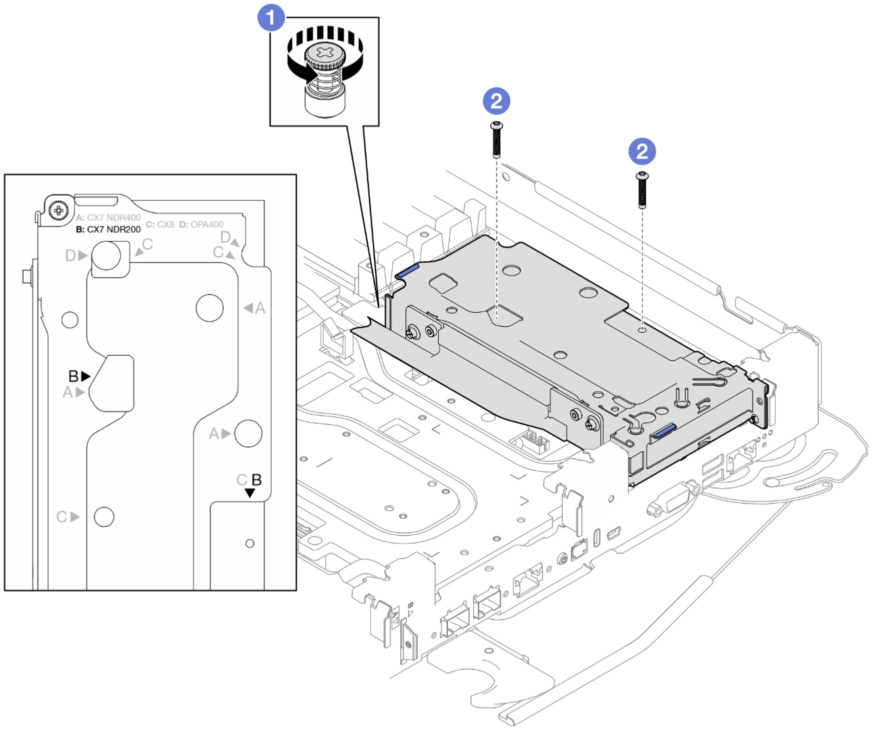


Figure 54. Loosening the ConnectX-7 200 riser assembly

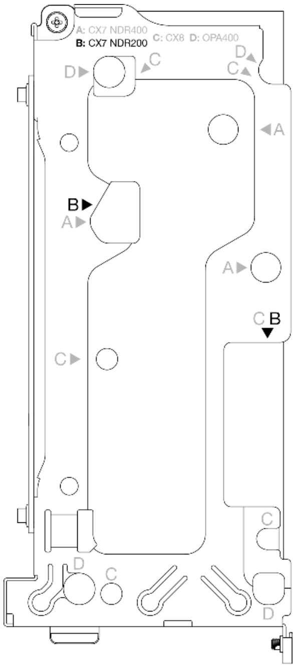


Figure 55. Screw holes marked with B on riser cage

Step 4. Carefully grasp the riser assembly by its edges and remove it out of the node.

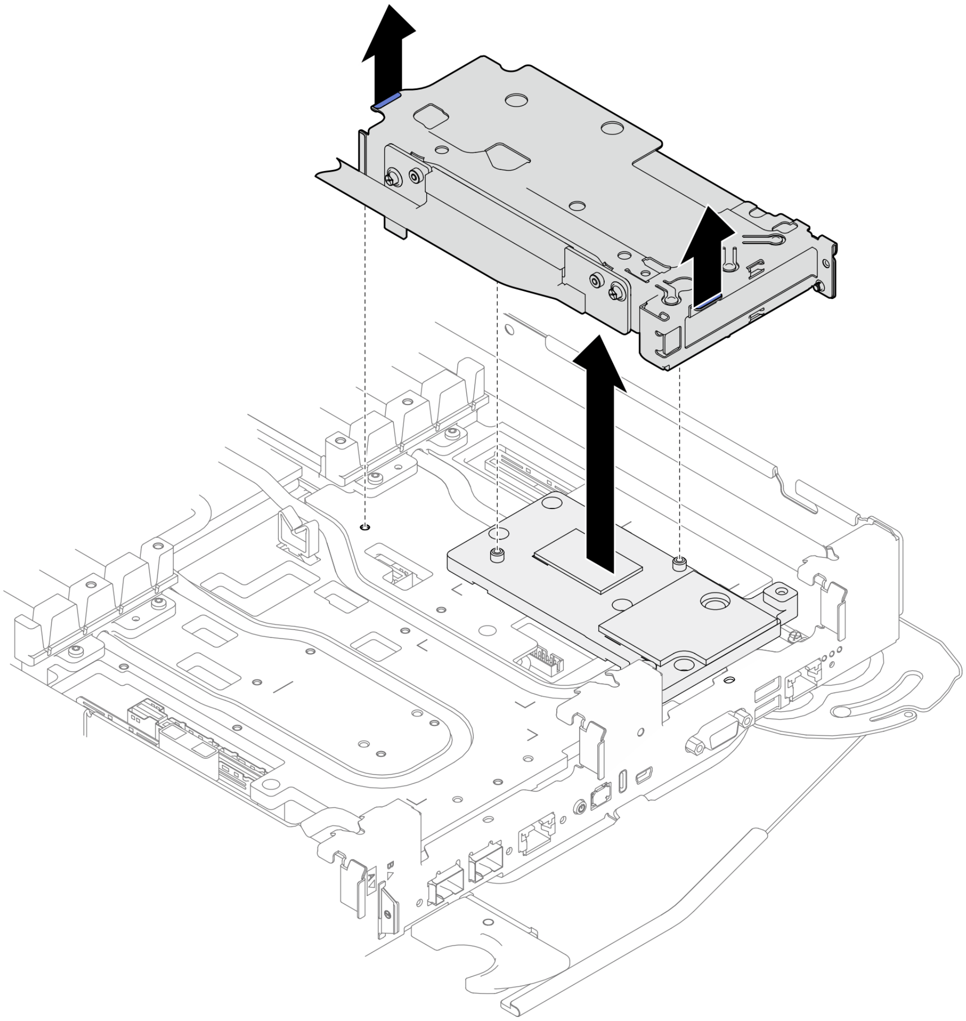


Figure 56. Removing ConnectX-7 NDR 200 riser assembly removal

Step 5. If necessary, remove the interface plate.

a. Remove the hex standoff screw and five PH1 screws from the interface plate.

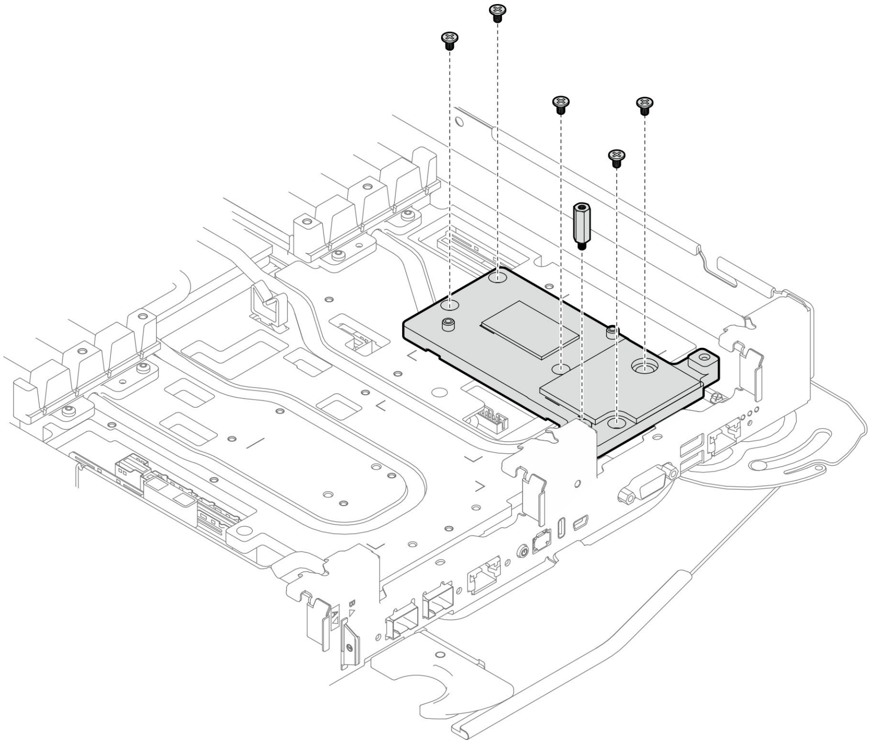


Figure 57. Removing ConnectX-7 NDR 200 riser assembly interface plate

b. Release the interface plate with a flat head screwdriver.

  1. There are openings (marked with black triangle in the illustration below) on the bottom side of the interface plate for inserting a flat head screwdriver—select the one that is accessible for the flat head screwdriver.
  2. Insert a flat head screwdriver into the opening; then, slightly rotate the screwdriver to release the interface plate from the water loop cold plate.

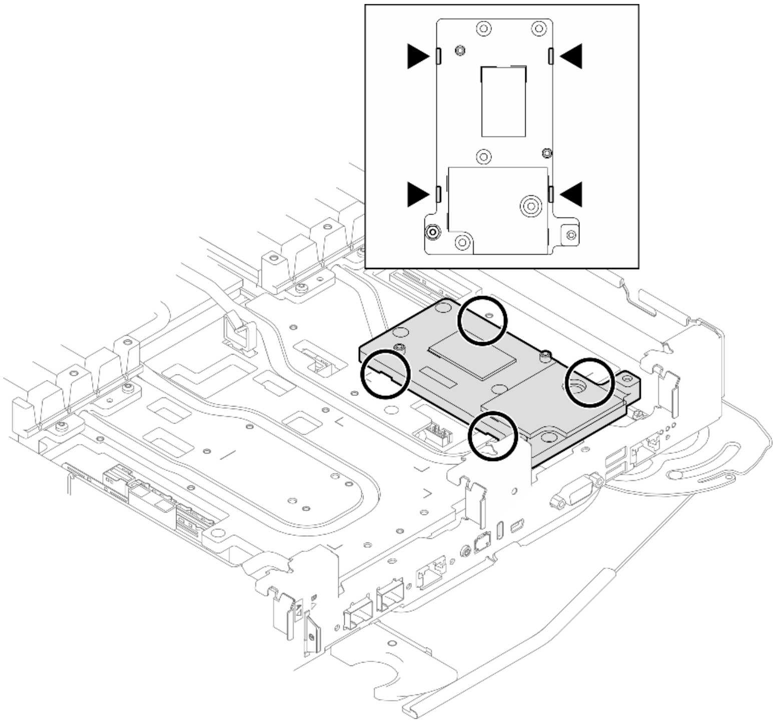


Figure 58. Locations of openings on the bottom side of the ConnectX-7 NDR 200 riser assembly interface plate

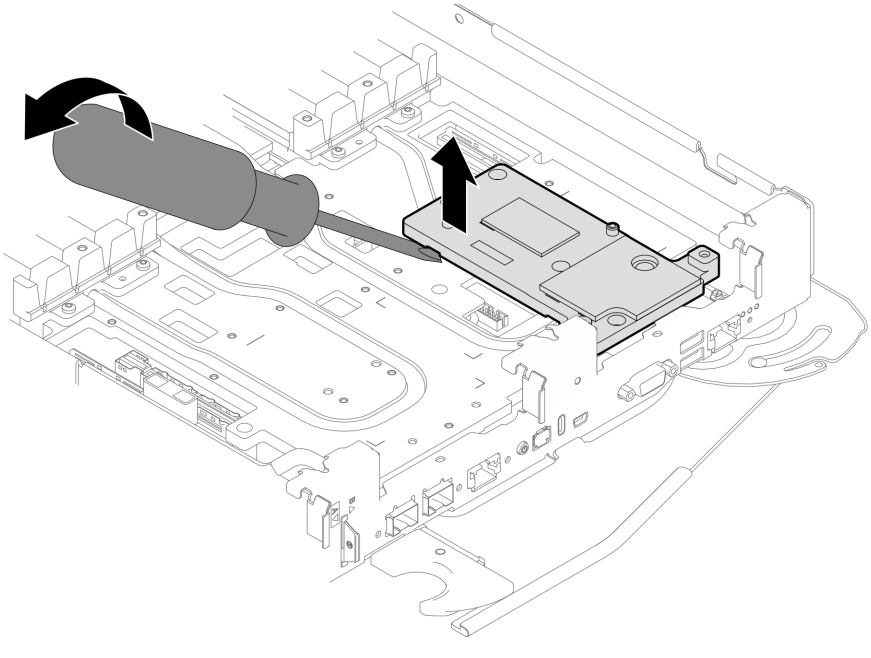


Figure 59. Releasing the interface plate from water loop cold plate

c. Remove the interface plate from the tray.

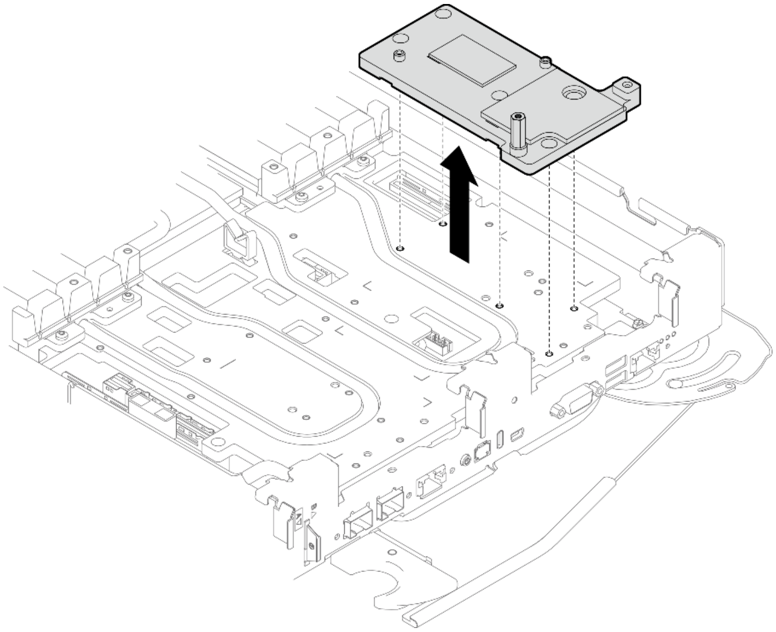


Figure 60. Removing the interface plate

Step 6. If no riser cage or drive cage is to be installed, install the blank bezel filler.

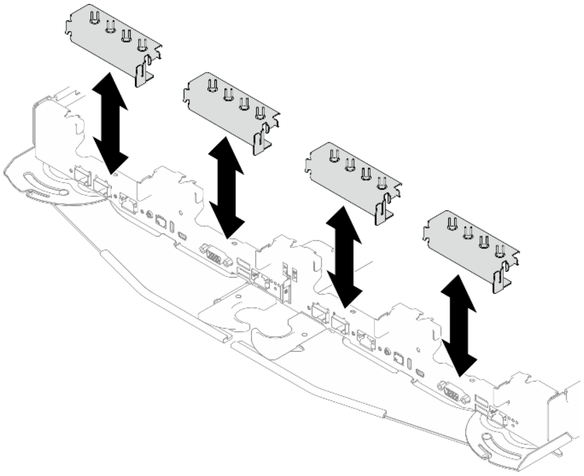


Figure 61. Installing blank bezel filler

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a ConnectX-7 NDR 200 adapter riser assembly

Use this information to install a ConnectX-7 NDR 200 adapter riser assembly.

About this task

Required tools

- Screwdriver for T10 and PH1 screws

- Waterloop Miscellaneous Kit (SC750 V4) .
- CX7 NDR200 Gap Pad (SC750 V4)
- CX7 NDR200 Conduction Plate (if installing ConnectX-7 NDR 200 for the first time)

Important: Gap pad replacement guidelines
- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:
- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. PCIe riser assembly installation rule is different for each PCIe configurations: standalone, socket direct, and shared I/O. When selecting riser slot to install a PCIe riser assembly, make sure to reference the rules specified in "Front drive and PCIe adapter configuration" on page 21.

Step 2. Make sure to install correct type of PCIe riser cage to the corresponding riser slot.

Note: The type of PCIe riser cage installed in slot 1 and slot 2 are different. See the illustration below for proper PCIe riser cage installation.

Riser cage type	Slot numbering
1 Riser cage with cabled riser	**PCIe slot 2**
2 Standard riser cage	**PCIe Slot 1**

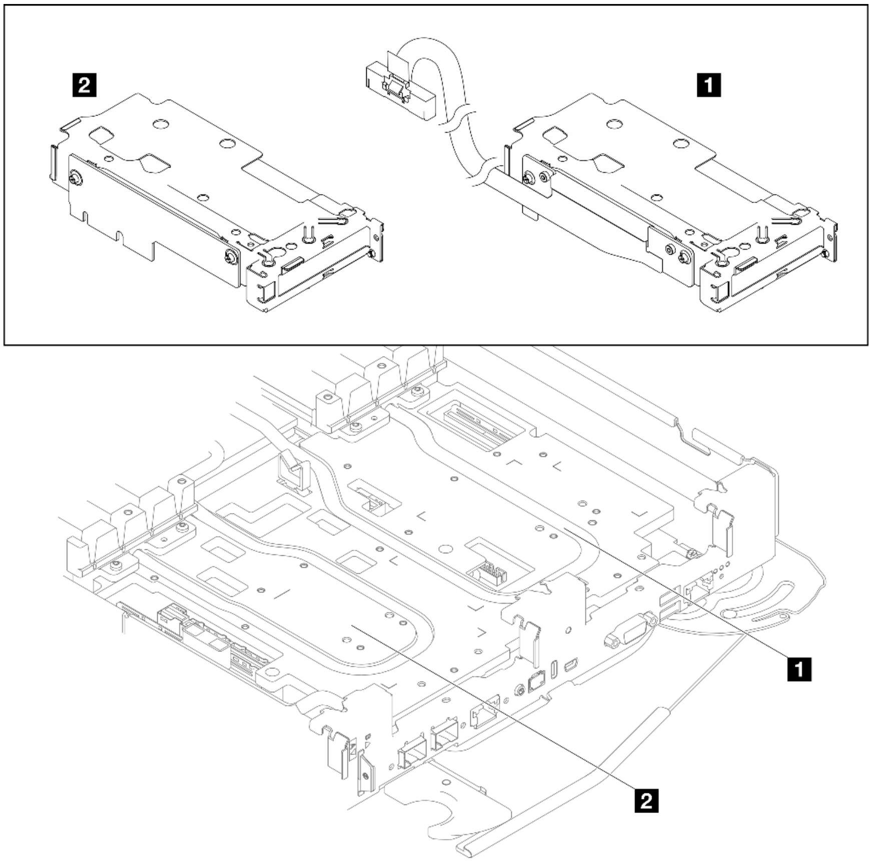


Figure 62. PCIe riser cage types for slot 1 and slot 2

Step 3. Remove the blank bezel fillers if they are installed.

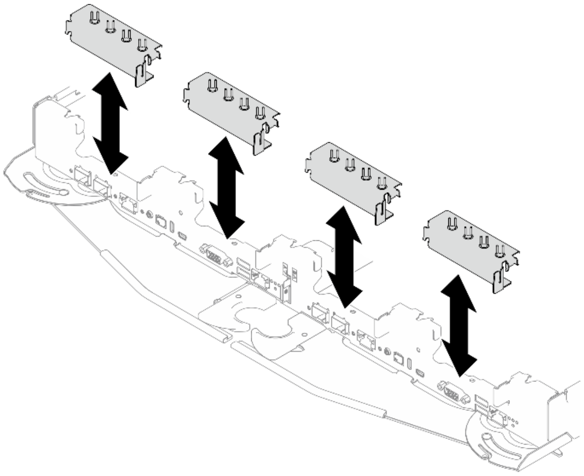


Figure 63. Removing blank bezel filler

Step 4. If the interface plate was removed, install the interface plate to the water loop.

a. Align the interface plate with the two guide pins on the water loop (marked with circles in the illustration below).

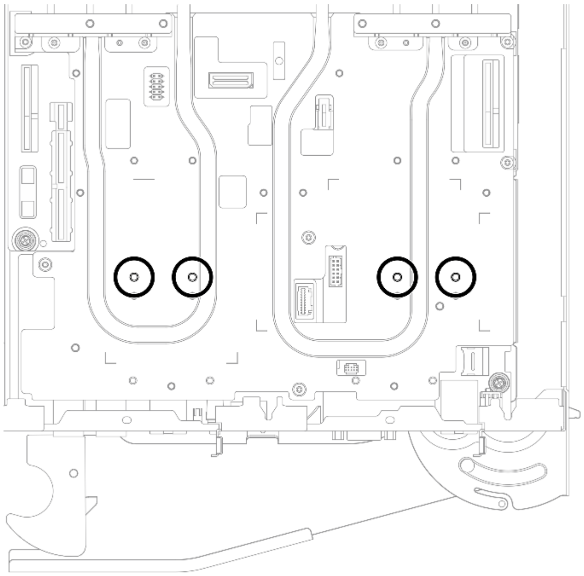


Figure 64. Guide pins for PCIe adapter interface plate

b. Place the interface plate on the water loop; then, install the hex screw and five PH1 screws.

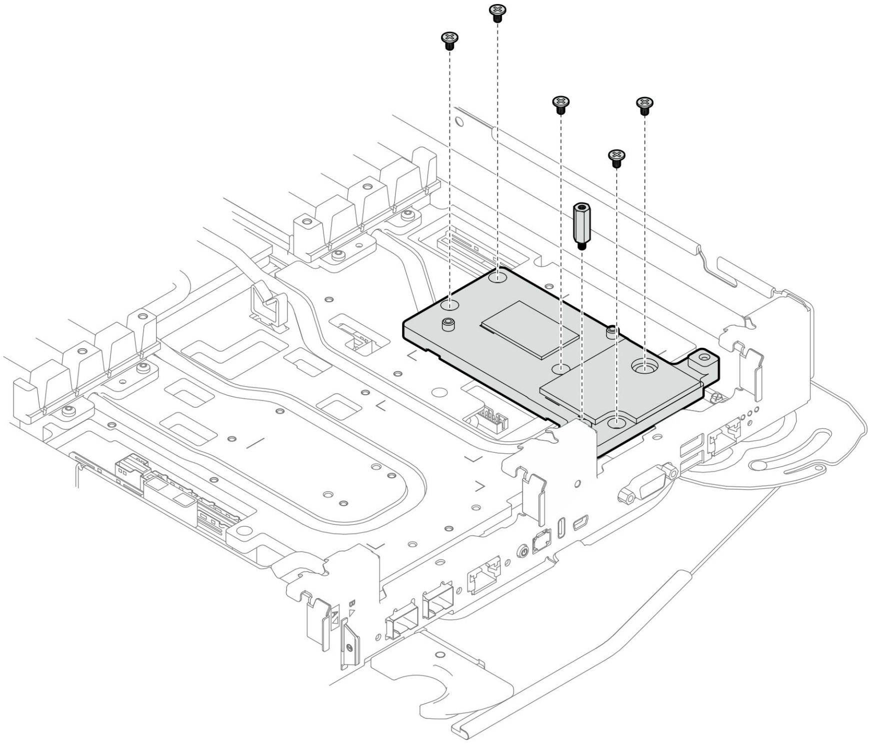


Figure 65. ConnectX-7 NDR 200 riser assembly interface plate installation

Step 5. Replace the single-use gap pad on the interface plate with a new one. Make sure to follow Gap pad/putty pad replacement guidelines.

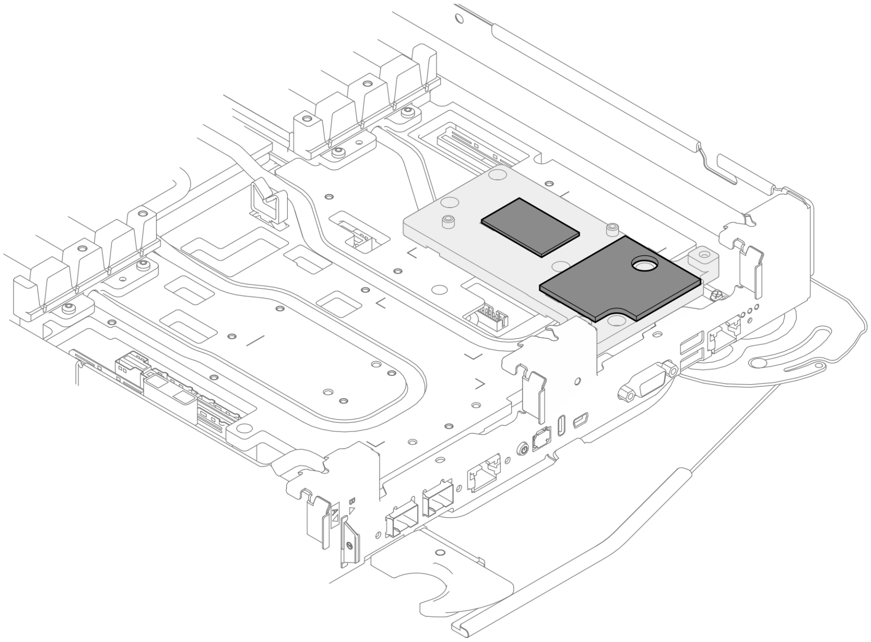


Figure 66. ConnectX-7 NDR 200 riser assembly interface plate gap pads

Step 6. Install the ConnectX-7 NDR 200 riser assembly.

a. ❶ Install the ConnectX-7 riser assembly to the water loop.

b. ❷ Install three T10 screws to screw holes marked with **B** on the riser cage.

c. ❸ Fasten the captive screw to secure the riser assembly to the water loop.

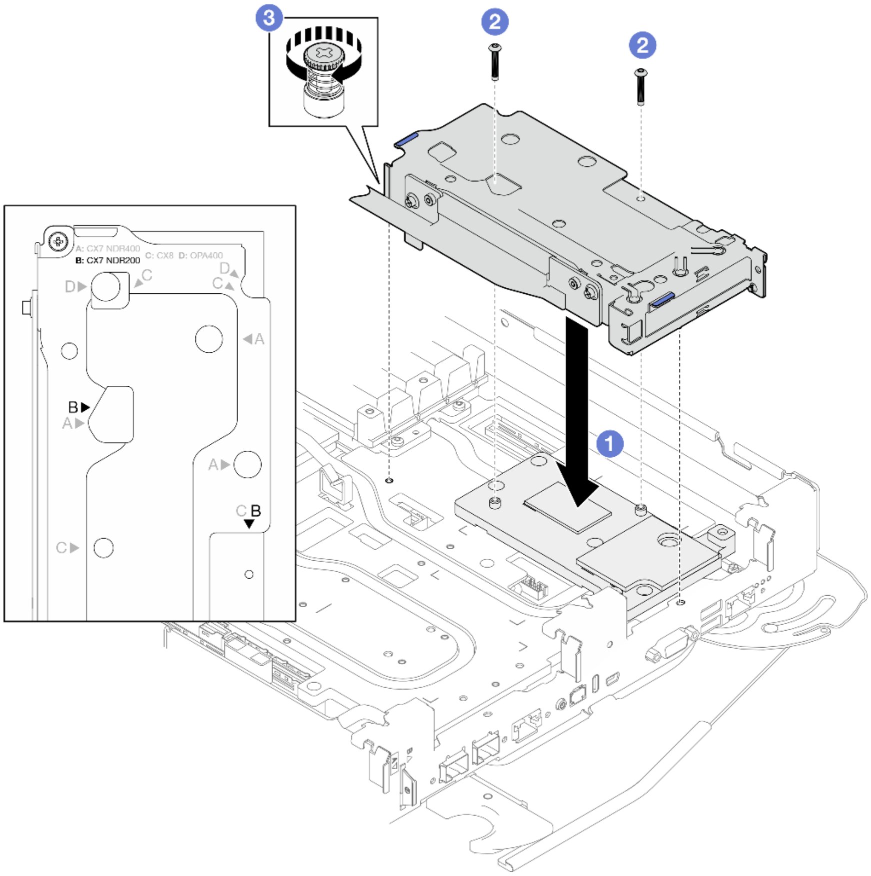


Figure 67. Installing ConnectX-7 NDR 200 riser assembly

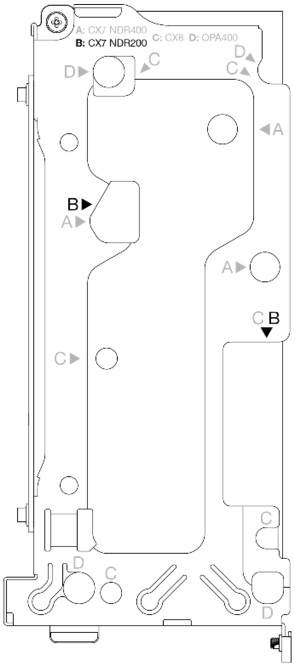


Figure 68. Screw holes marked with B on the riser cage

Step 7. Install the clamp bracket to the riser assembly and fasten the captive screw to secure it. Install the screw to the front of the riser assembly.

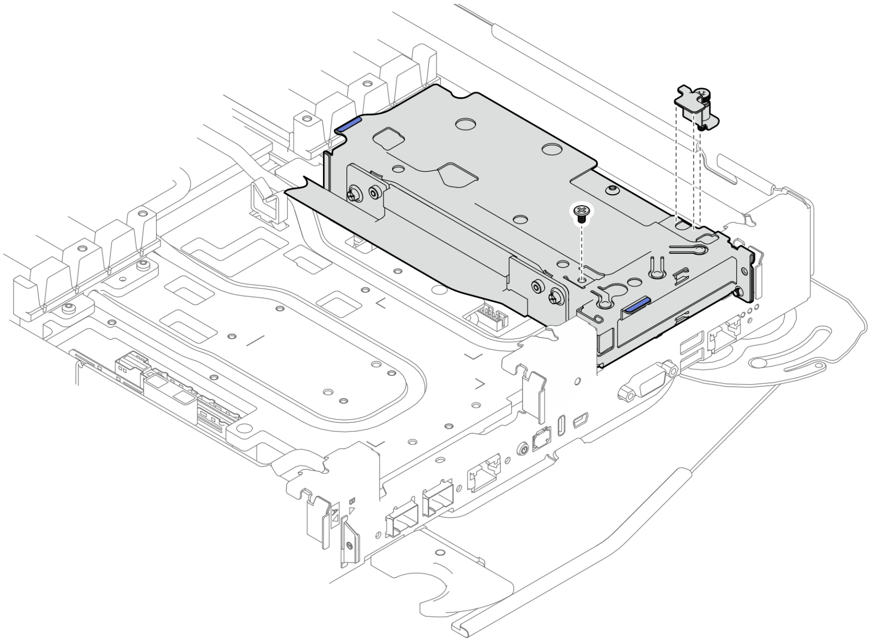


Figure 69. Installing clamp and screw to the riser assembly

After you finish

1. Connect the PCIe adapter cables to the system board. See ***Internal Cable Routing Guide***.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

ConnectX-7 NDR 400 adapter riser assembly replacement

Use the following procedures to remove and install a ConnectX-7 NDR 400 adapter riser assembly.

Remove a ConnectX-7 NDR 400 adapter riser assembly

Use this information to remove a ConnectX-7 NDR 400 adapter riser assembly.

About this task

Required tools
- Screwdriver for T10 and PH1 screws
- Waterloop Miscellaneous Kit (SC750 V4) .

- CX7 Gap Pad (SC750 V4)
- CX7 Conduction Plate (if installing ConnectX-7 NDR 400 for the first time)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

d. For shared I/O or socket direct configurations, disconnect the cable from the system board. See ***Internal Cable Routing Guide***.

Step 2. Loosen the ConnectX-7 NDR 400 riser assembly from the water loop.

a. ① Loosen the captive screw on the riser assembly.

b. ② Remove three T10 screws from the screw holes marked with **A** on the riser cage.

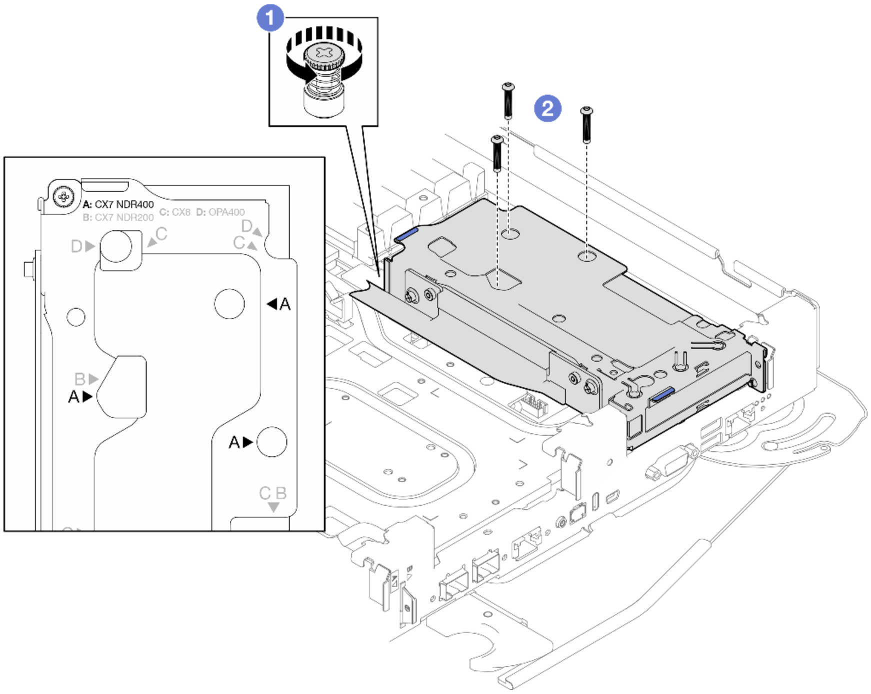


Figure 70. Loosening the ConnectX-7 400 riser assembly

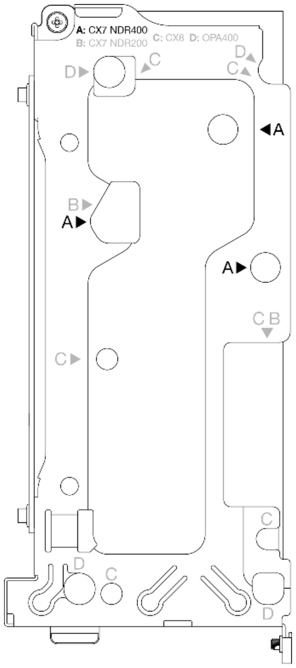


Figure 71. Screw holes marked with A on riser cage

Step 3. Carefully grasp the riser assembly by its edges and remove it out of the node.

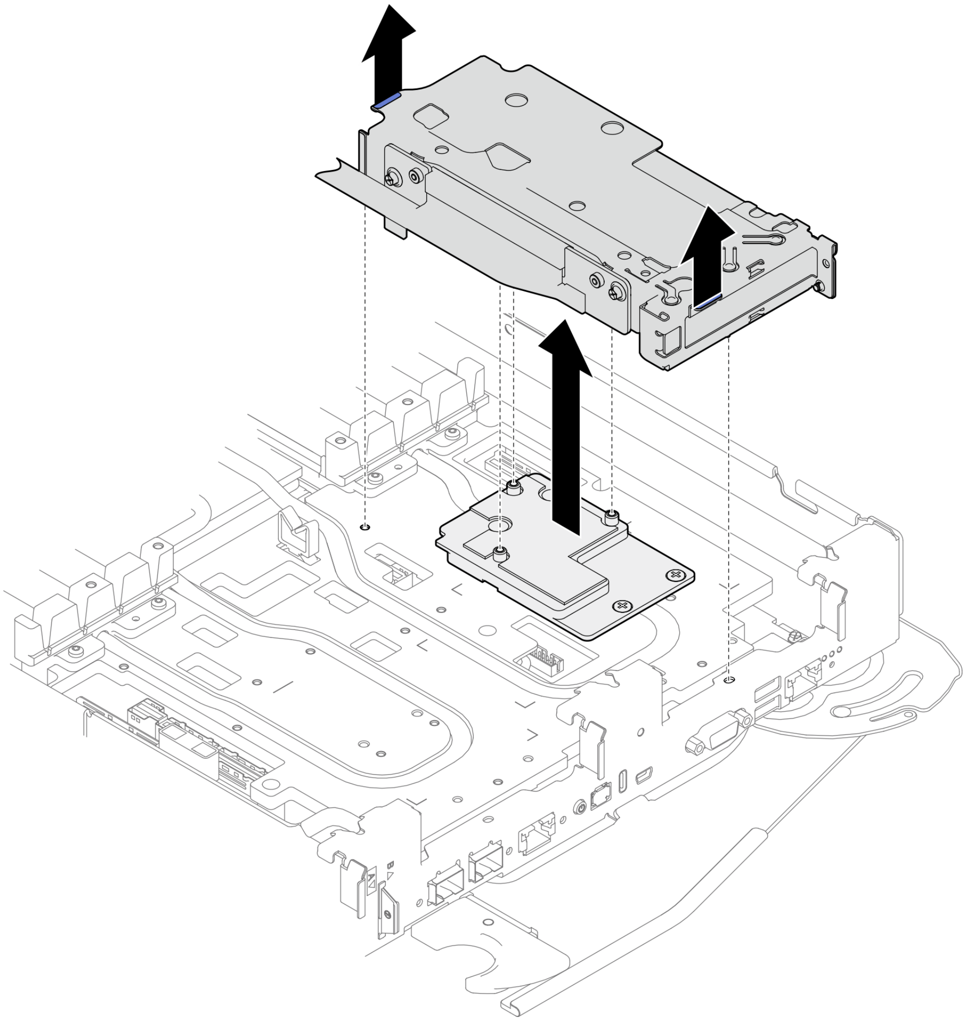


Figure 72. Removing ConnectX-7 NDR 400 riser assembly removal

Step 4. If necessary, remove the interface plate.

a. Remove the four PH1 screws from the interface plate.

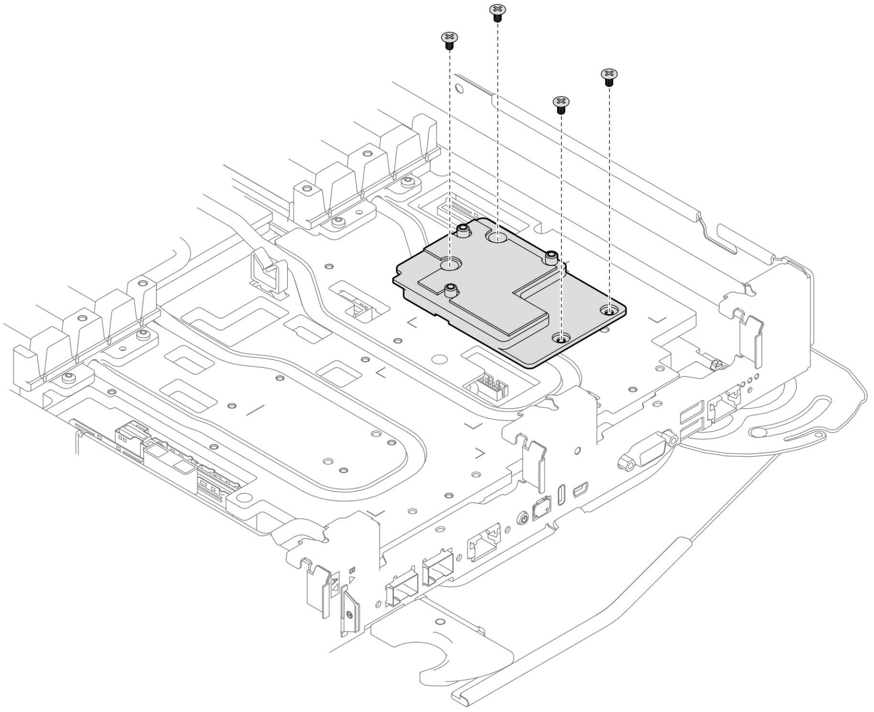


Figure 73. Removing ConnectX-7 NDR 400 riser assembly interface plate

b. Release the interface plate with a flat head screwdriver.

   1. There are openings (marked with black triangle in the illustration below) on the bottom side of the interface plate for inserting a flat head screwdriver—select the one that is accessible for the flat head screwdriver.
   2. Insert a flat head screwdriver into the opening; then, slightly rotate the screwdriver to release the interface plate from the water loop cold plate.

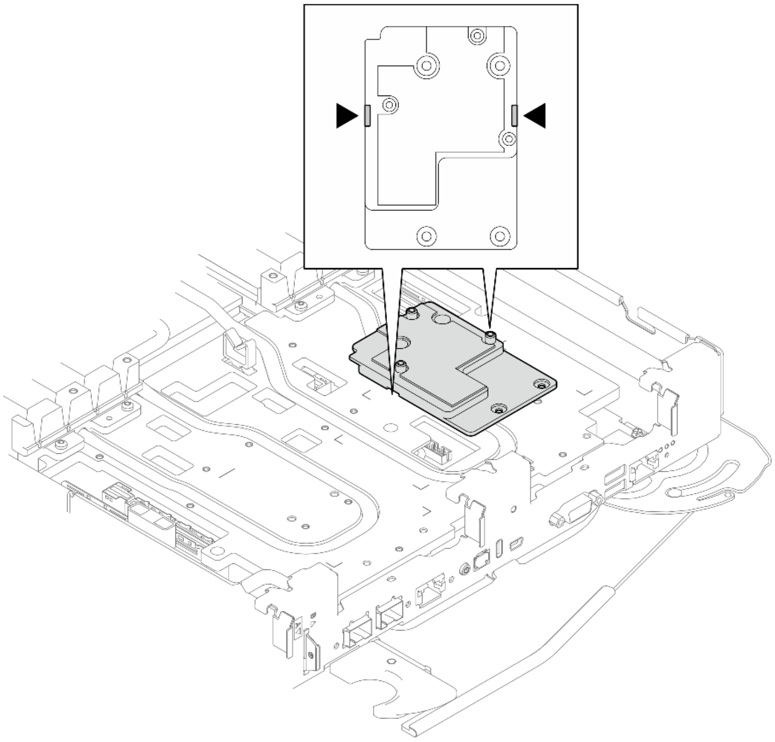


Figure 74. Locations of openings on the bottom side of the ConnectX-7 NDR 400 riser assembly interface plate

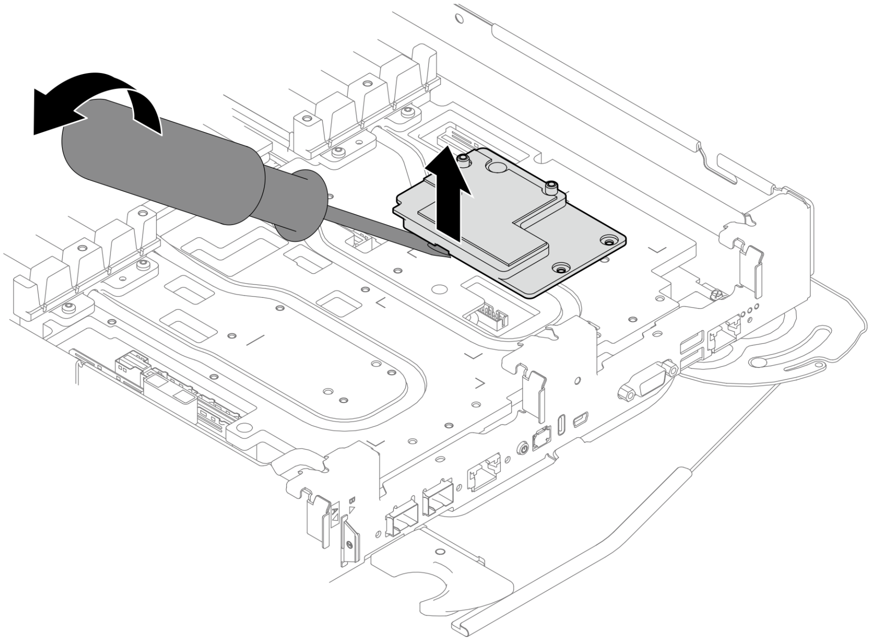


Figure 75. Releasing the interface plate from water loop cold plate

c. Remove the interface plate from the tray.

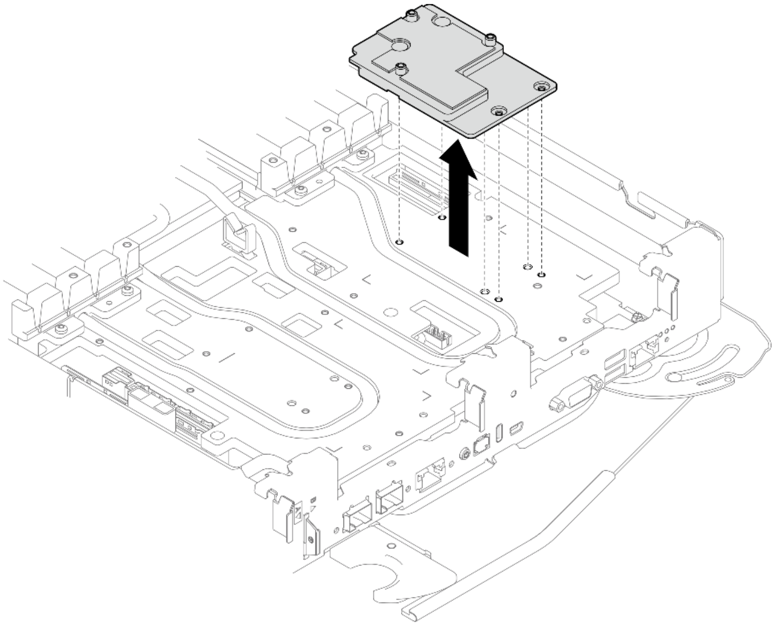


Figure 76. Removing the interface plate

Step 5. If no riser cage or drive cage is to be installed, install the blank bezel filler.

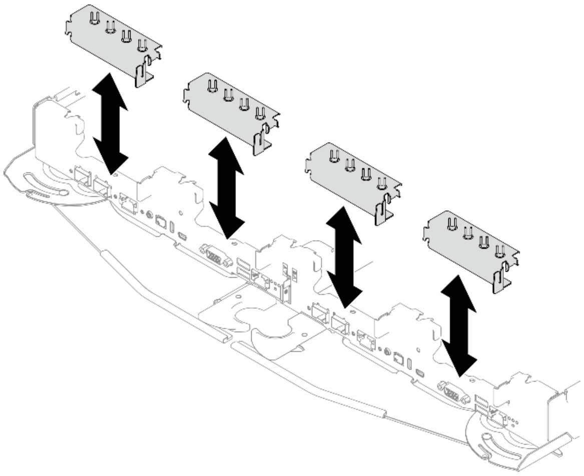


Figure 77. Installing blank bezel filler

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a ConnectX-7 NDR 400 adapter riser assembly

Use this information to install a ConnectX-7 NDR 400 adapter riser assembly.

About this task

Required tools

- Screwdriver for T10 and PH1 screws

- Waterloop Miscellaneous Kit (SC750 V4) .
- CX7 Gap Pad (SC750 V4)
- CX7 Conduction Plate (if installing ConnectX-7 NDR 400 for the first time)

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. PCIe riser assembly installation rule is different for each PCIe configurations: standalone, socket direct, and shared I/O. When selecting riser slot to install a PCIe riser assembly, make sure to reference the rules specified in "Front drive and PCIe adapter configuration" on page 21.

Step 2. Make sure to install correct type of PCIe riser cage to the corresponding riser slot.

Note: The type of PCIe riser cage installed in slot 1 and slot 2 are different. See the illustration below for proper PCIe riser cage installation.

Riser cage type	**Slot numbering**
1 Riser cage with cabled riser	**PCIe slot 2**
2 Standard riser cage	**PCIe Slot 1**

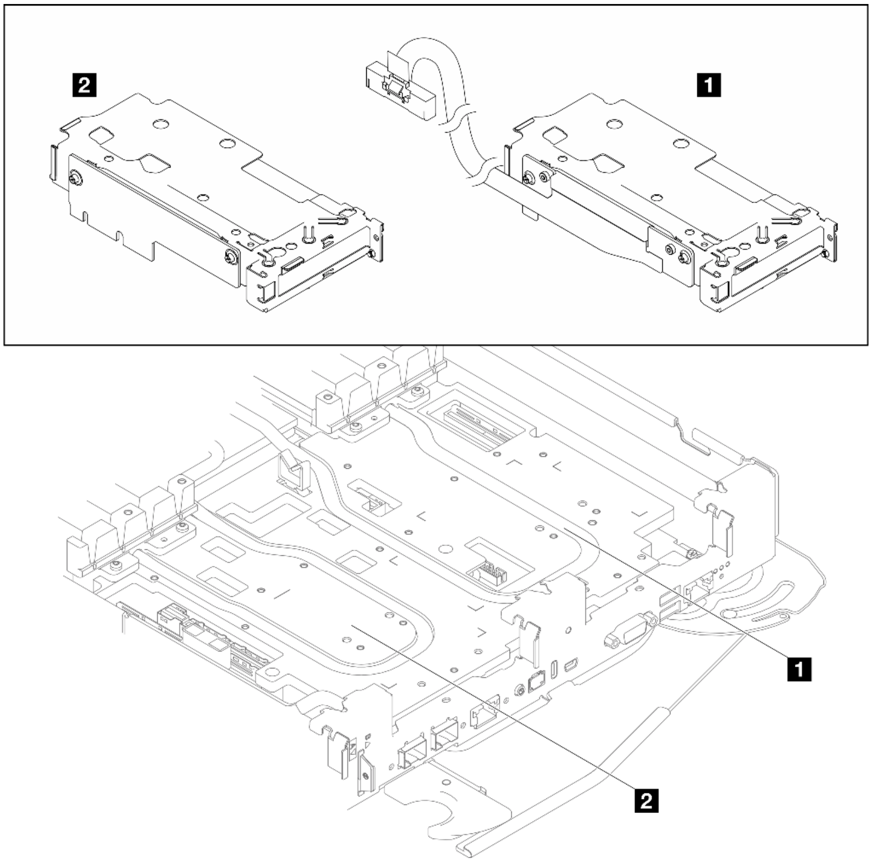


Figure 78. PCIe riser cage types for slot 1 and slot 2

Step 3. Remove the blank bezel fillers if they are installed.

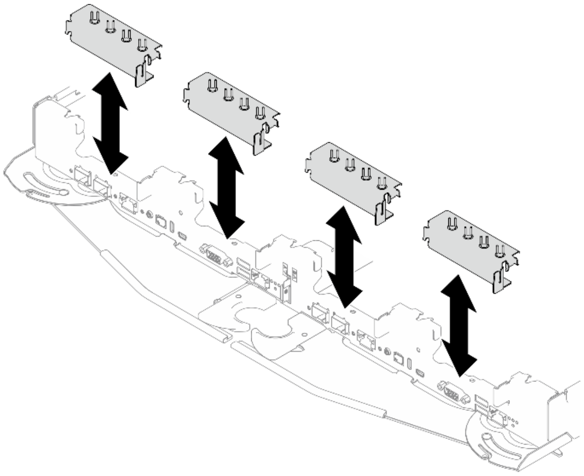


Figure 79. Removing blank bezel filler

Step 4. If the interface plate was removed, install the interface plate to the water loop.

a. Align the interface plate with the two guide pins on the water loop (marked with circles in the illustration below).

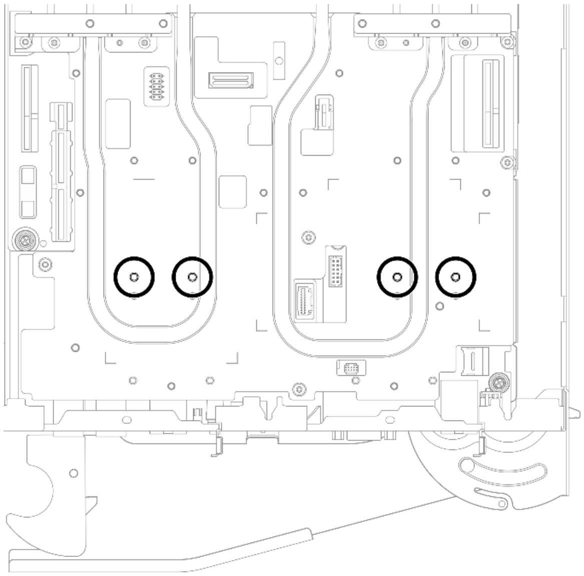


Figure 80. Guide pins for PCIe adapter interface plate

b. Place the interface plate on the water loop; then, install four PH1 screws.

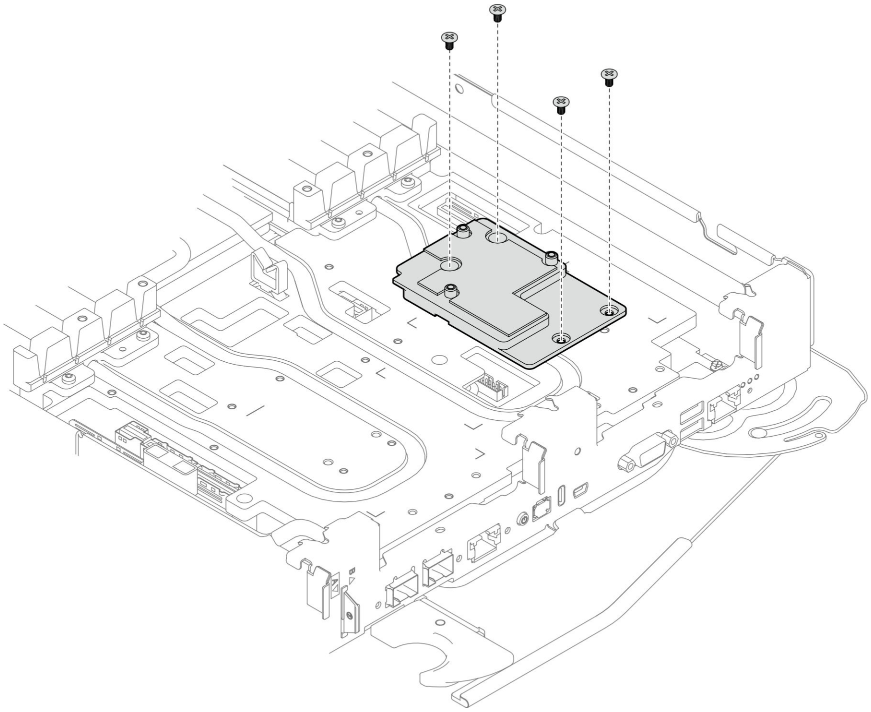


Figure 81. ConnectX-7 NDR 400 riser assembly interface plate installation

Step 5. Replace the single-use gap pad on the interface plate with a new one. Make sure to follow Gap pad/putty pad replacement guidelines.

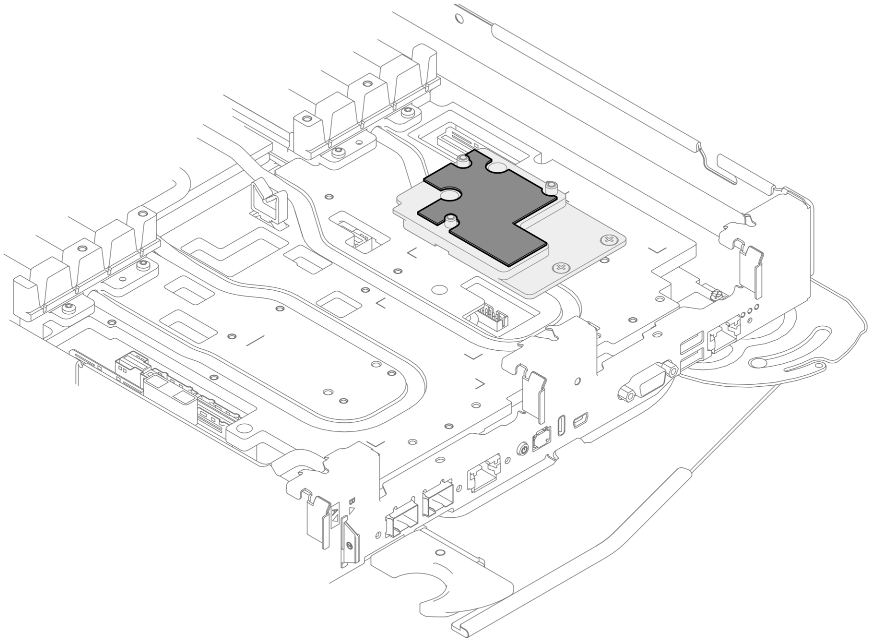


Figure 82. ConnectX-7 NDR 400 riser assembly interface plate single-use gap pad

Step 6. Install the ConnectX-7 NDR 400 riser assembly.

a. ❶ Install the ConnectX-7 riser assembly to the water loop.

b. ❷ Install three T10 screws to screw holes marked with **A** on the riser cage.

c. ❸ Fasten the captive screw to secure the riser assembly to the water loop.

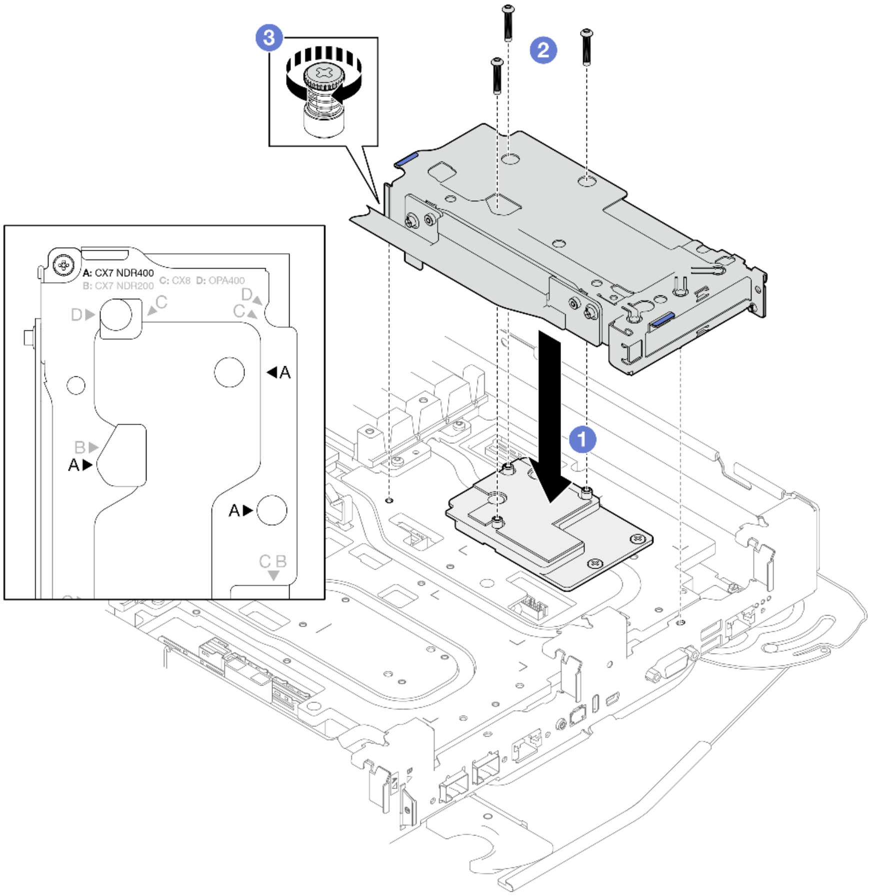


Figure 83. Installing ConnectX-7 NDR 400 riser assembly

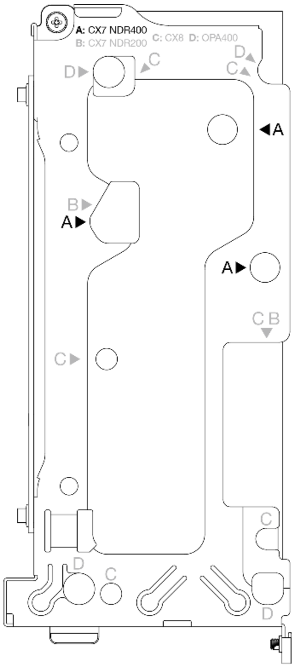


Figure 84. Screw holes marked with A on the riser cage

After you finish

1. Connect the PCIe adapter cables to the system board. See ***Internal Cable Routing Guide***.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

ConnectX-8 adapter riser assembly replacement

Use the following procedures to remove and install a ConnectX-8 adapter riser assembly.

Remove a ConnectX-8 adapter riser assembly

Use this information to remove a ConnectX-8 adapter riser assembly.

About this task

Required tools

- Screwdriver for **T6 and PH1** screws
- Waterloop Miscellaneous Kit (SC750 V4) .
- CX8 Conduction Plate
- CX8 Gap Pad (if installing ConnectX-8 for the first time)
- The system supports two types of riser cages, **1** with A/B printing and **2** with A/B/C/D printing, as shown in the illustration below. Make sure to use riser cage **2** when installing the **Connect-X 8 adapter**.

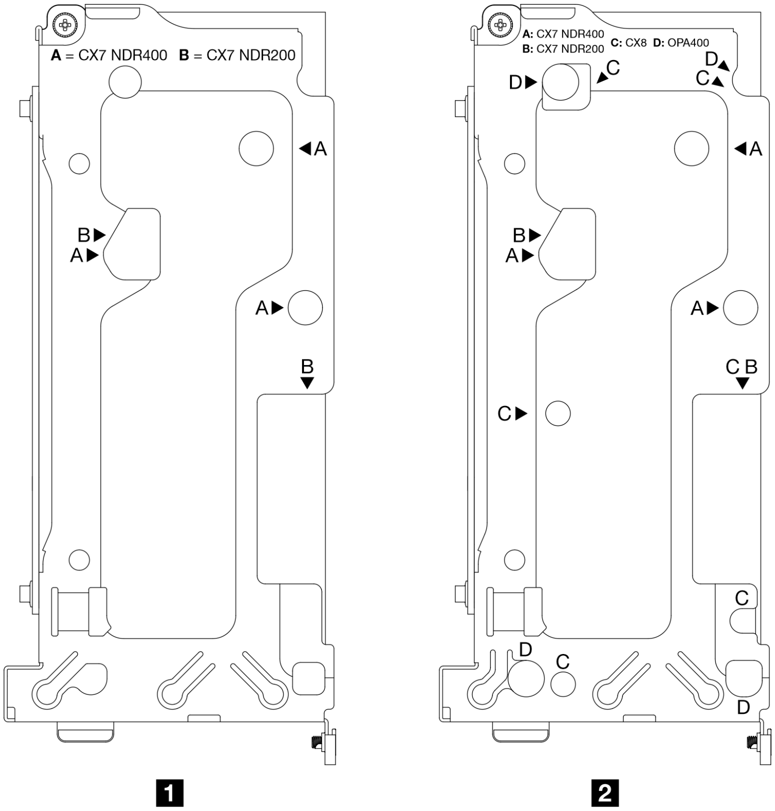


Figure 85. Riser cage types

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See “Remove a tray from the enclosure” on page 332.

b. Remove the tray cover. See “Remove the tray cover” on page 372.

c. Remove the cross braces. See “Remove the cross braces” on page 108.

d. For shared I/O or socket direct configurations, disconnect the cable from the system board. See ***Internal Cable Routing Guide***.

Step 2. Loosen the ConnectX-8 riser assembly from the water loop.

a. ❶ Loosen the captive screw on the riser assembly.

b. ❷ Remove six T6 screws from the screw holes marked with **C** on the riser cage. Remove the screws with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 3+/- 0.5 lbf-in.

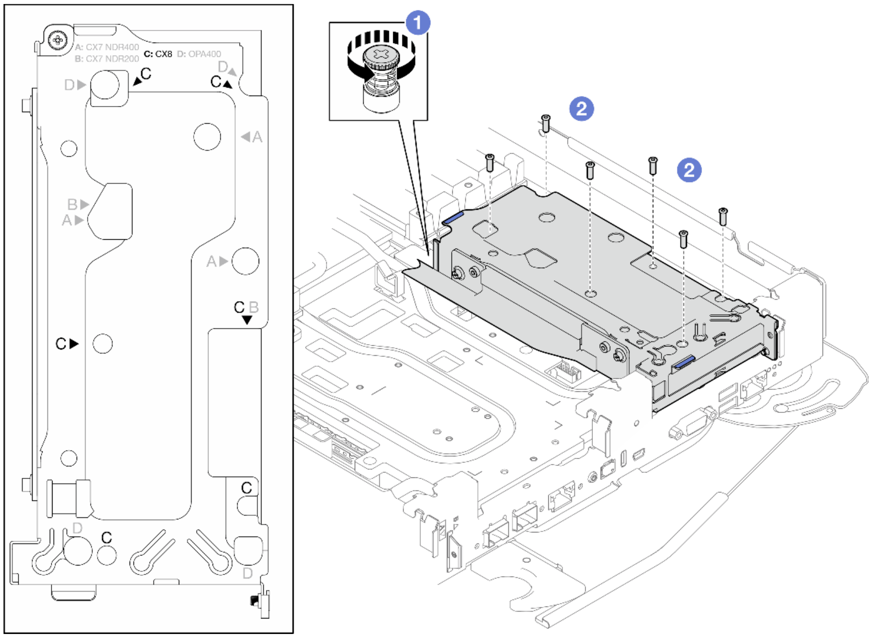


Figure 86. Loosening the ConnectX-8 riser assembly

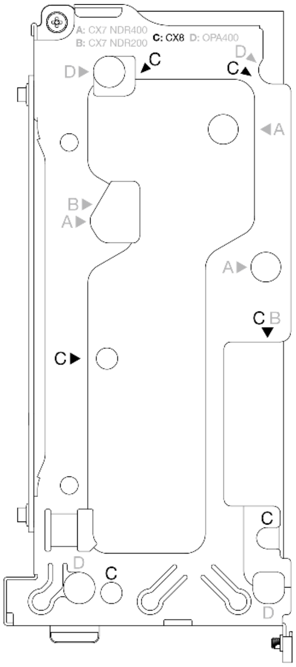


Figure 87. Screw holes marked with C on riser cage

Step 3. Carefully grasp the riser assembly by its edges and remove it out of the node.

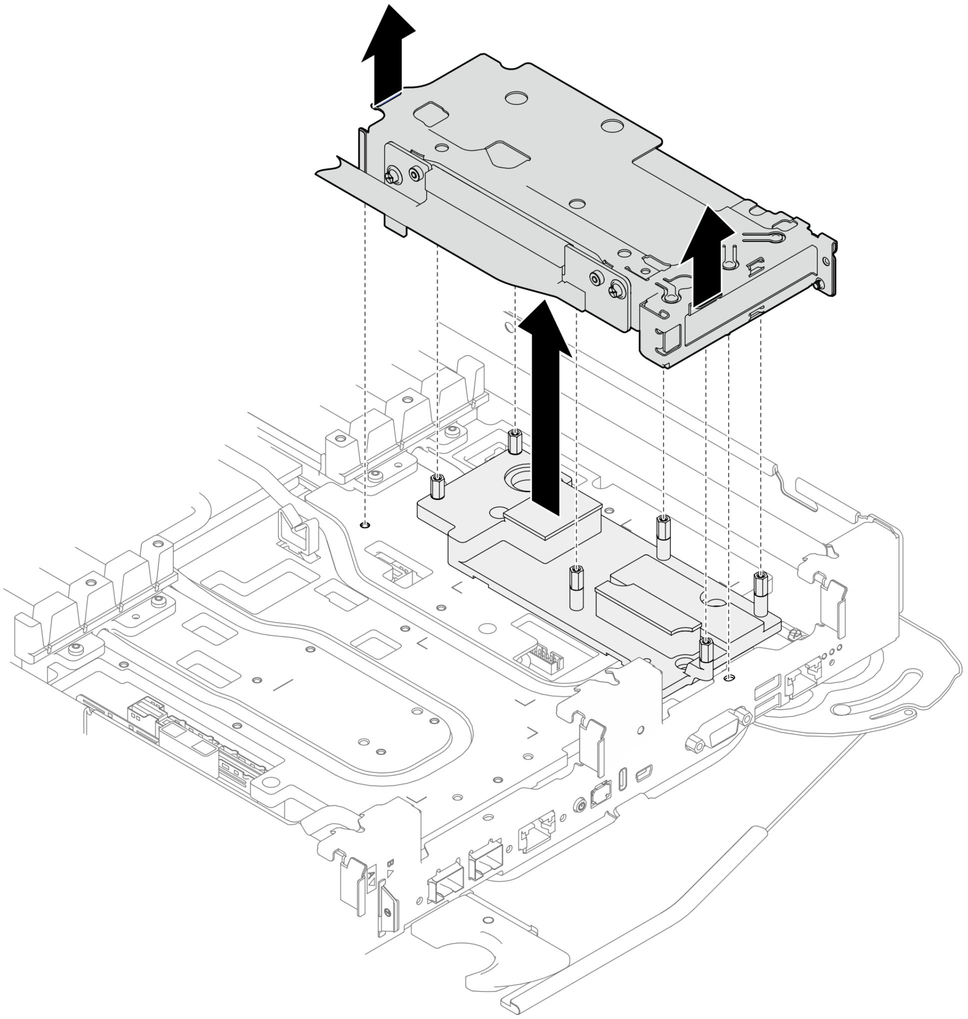


Figure 88. Removing ConnectX-8 riser assembly removal

Step 4. If necessary, remove the interface plate.

a. Remove the five PH1 screws from the interface plate.

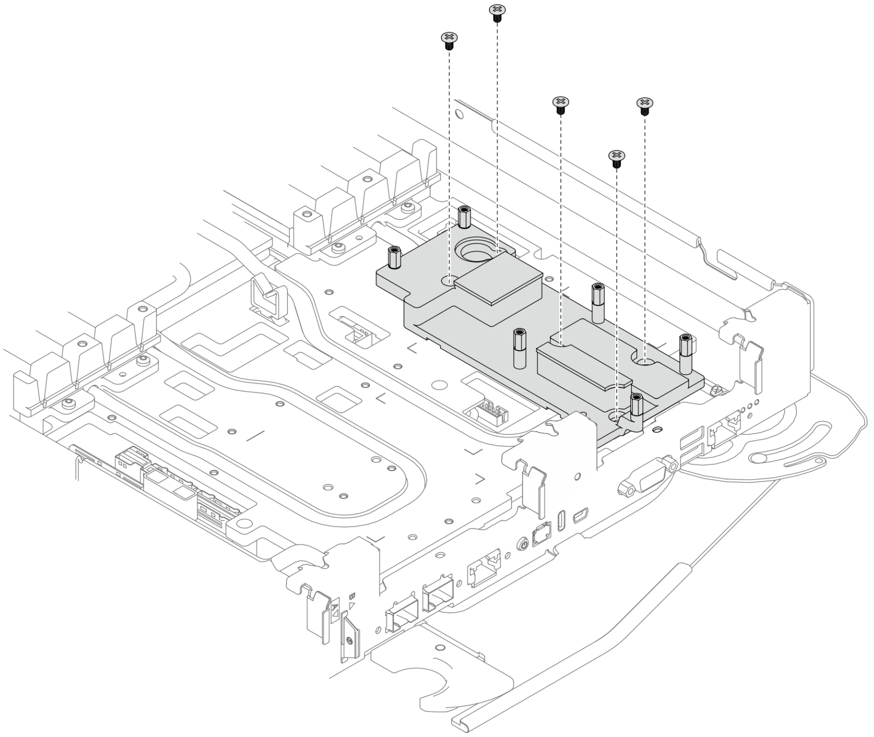


Figure 89. Removing ConnectX-8 riser assembly interface plate

b. Release the interface plate with a flat head screwdriver.

   1. There are openings (marked with black triangle in the illustration below) on the bottom side of the interface plate for inserting a flat head screwdriver—select the one that is accessible for the flat head screwdriver.
   2. Insert a flat head screwdriver into the opening; then, slightly rotate the screwdriver to release the interface plate from the water loop cold plate.

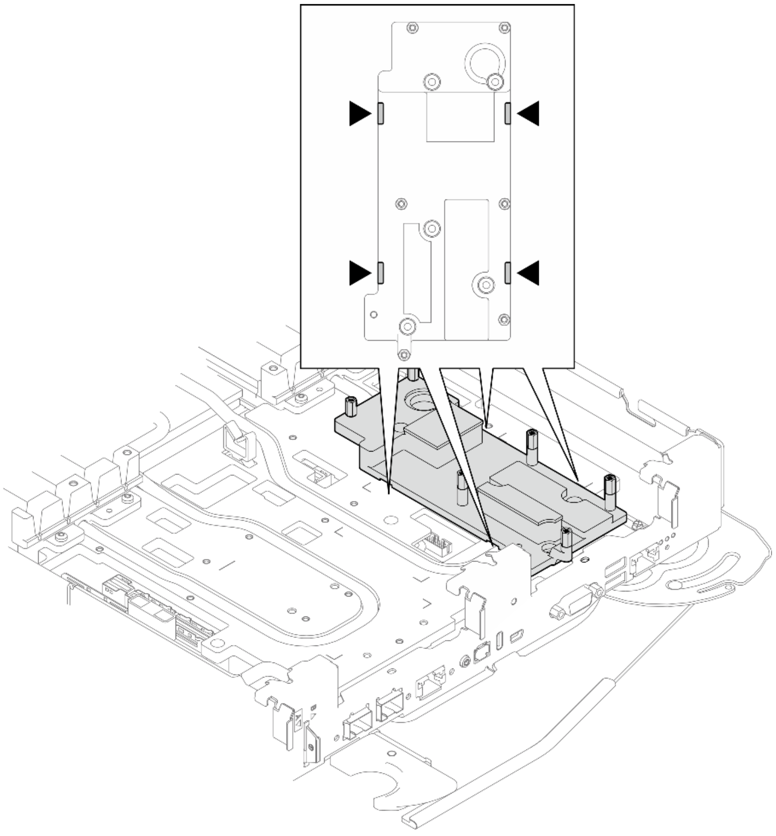


Figure 90. Locations of openings on the bottom side of the ConnectX-8 riser assembly interface plate

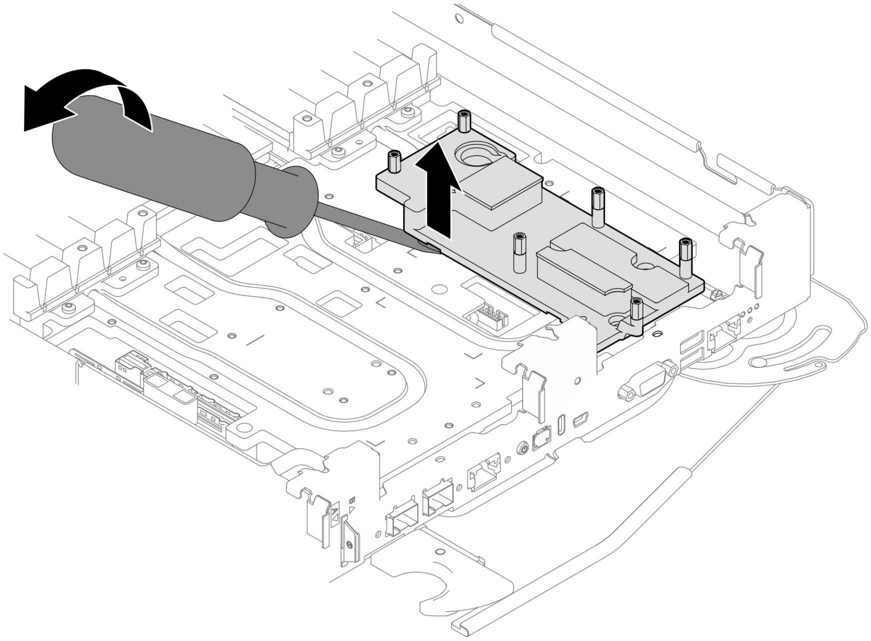


Figure 91. Releasing the interface plate from water loop cold plate

c. Remove the interface plate from the tray.

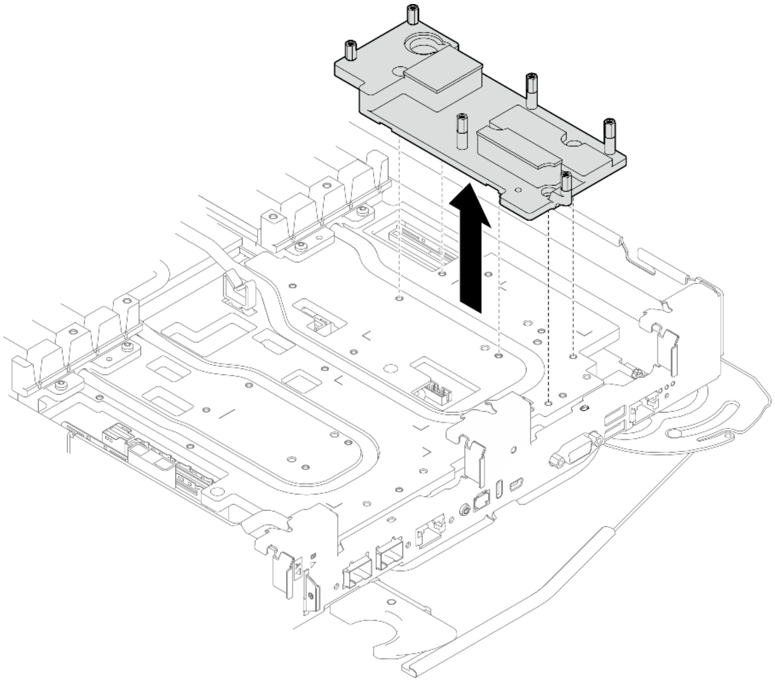


Figure 92. Removing the interface plate

Step 5. If no riser cage or drive cage is to be installed, install the blank bezel filler.

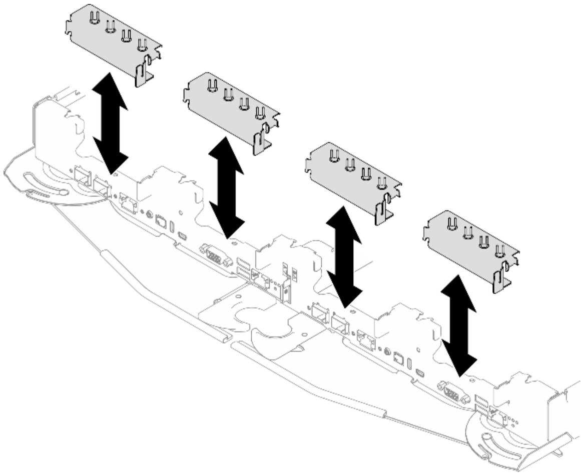


Figure 93. Installing blank bezel filler

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a ConnectX-8 adapter riser assembly

Use this information to install a ConnectX-8 adapter riser assembly.

About this task

Required tools

- Screwdriver for **T6 and PH1** screws
- Waterloop Miscellaneous Kit (SC750 V4) .
- CX8 Conduction Plate
- CX8 Gap Pad (if installing ConnectX-8 for the first time)
- The system supports two types of riser cages, **1** with A/B printing and **2** with A/B/C/D printing, as shown in the illustration below. Make sure to use riser cage **2** when installing the **Connect-X 8 adapter**.

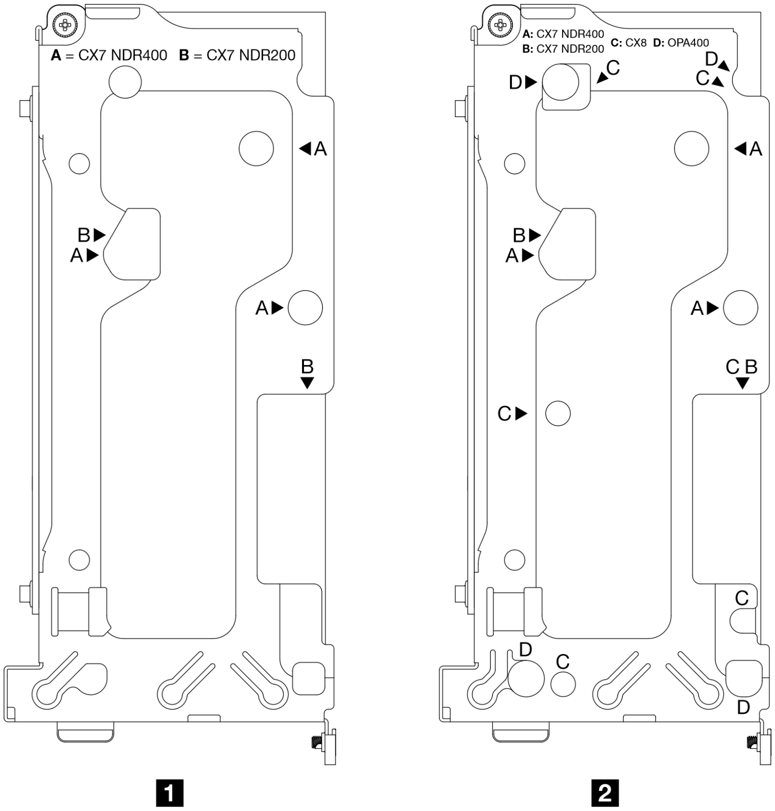


Figure 94. Riser cage types

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see “Gap pad identification and location” on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. PCIe riser assembly installation rule is different for each PCIe configurations: standalone, socket direct, and shared I/O. When selecting riser slot to install a PCIe riser assembly, make sure to reference the rules specified in “Front drive and PCIe adapter configuration” on page 21.

Step 2. Make sure to install correct type of PCIe riser cage to the corresponding riser slot.

Note: The type of PCIe riser cage installed in slot 1 and slot 2 are different. See the illustration below for proper PCIe riser cage installation.

Riser cage type	**Slot numbering**
1 Riser cage with cabled riser	**PCIe slot 2**
2 Standard riser cage	**PCIe Slot 1**

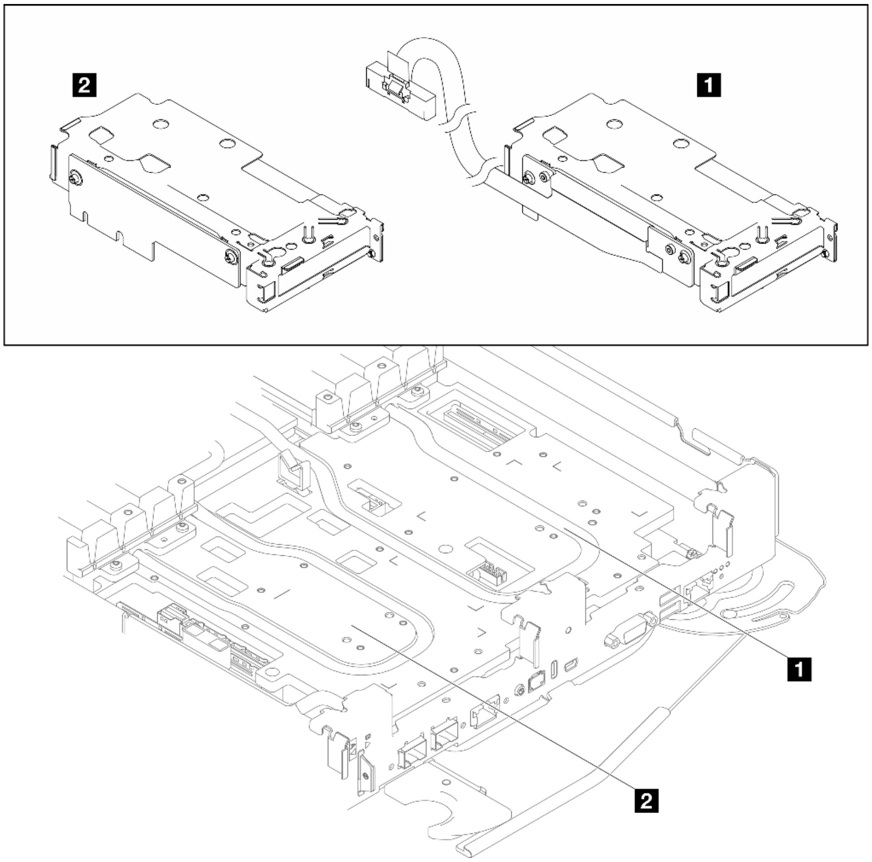


Figure 95. PCIe riser cage types for slot 1 and slot 2

Step 3. Remove the blank bezel fillers if they are installed.

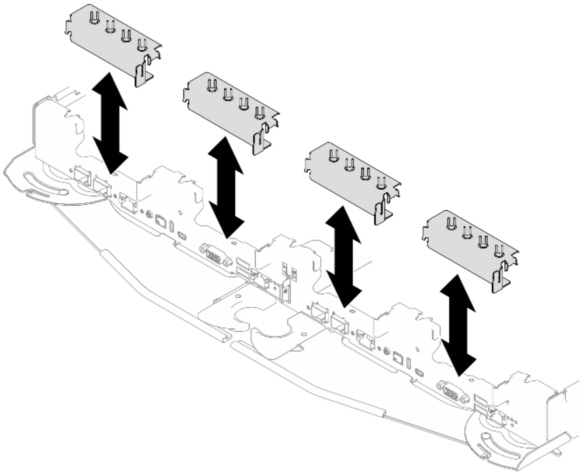


Figure 96. Removing blank bezel filler

Step 4. If the interface plate was removed, install the interface plate to the water loop.

a. Align the interface plate with the two guide pins on the water loop (marked with circles in the illustration below).

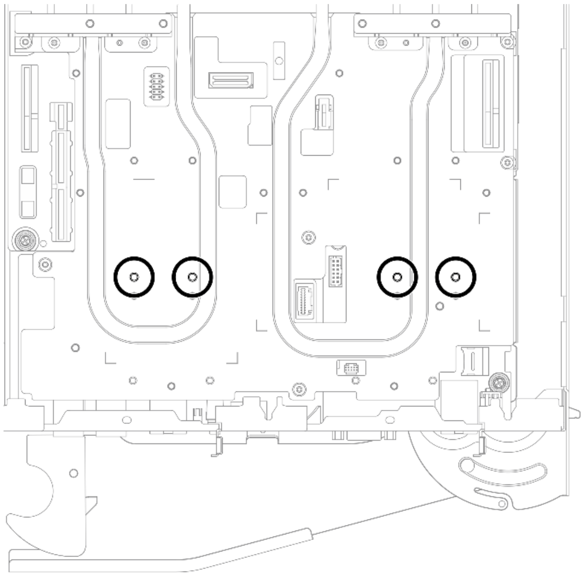


Figure 97. Guide pins for PCIe adapter interface plate

b. The interface plate ***must*** be installed with six studs. If not, install the six studs to the interface plate.

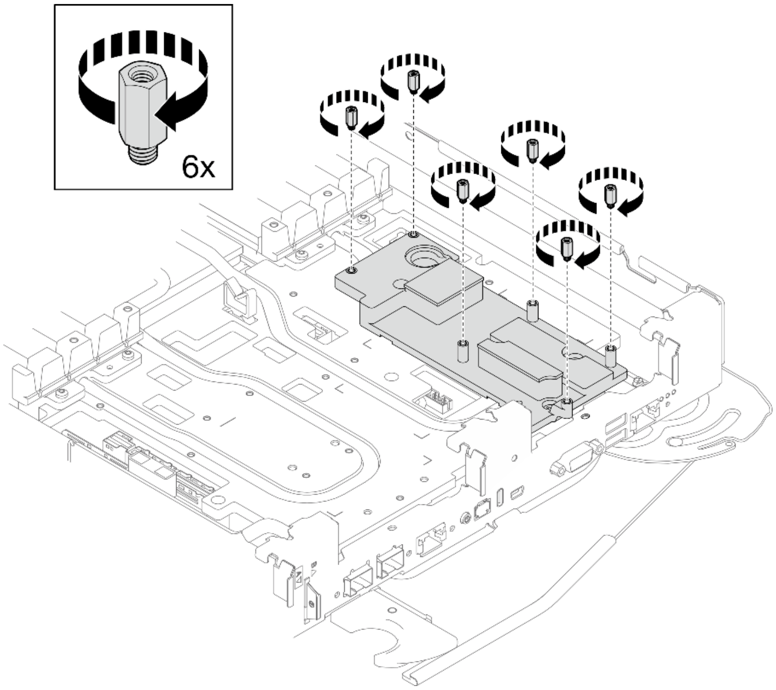


Figure 98. Installing six studs to the interface plate

c. Place the interface plate on the water loop; then, install five PH1 screws.

   Note: The screws must be installed to the studs on the interface plate. If there is no studs on the plate, install them to the plate before installing the screws, see Installing studs to ConnectX-8 interface plate.

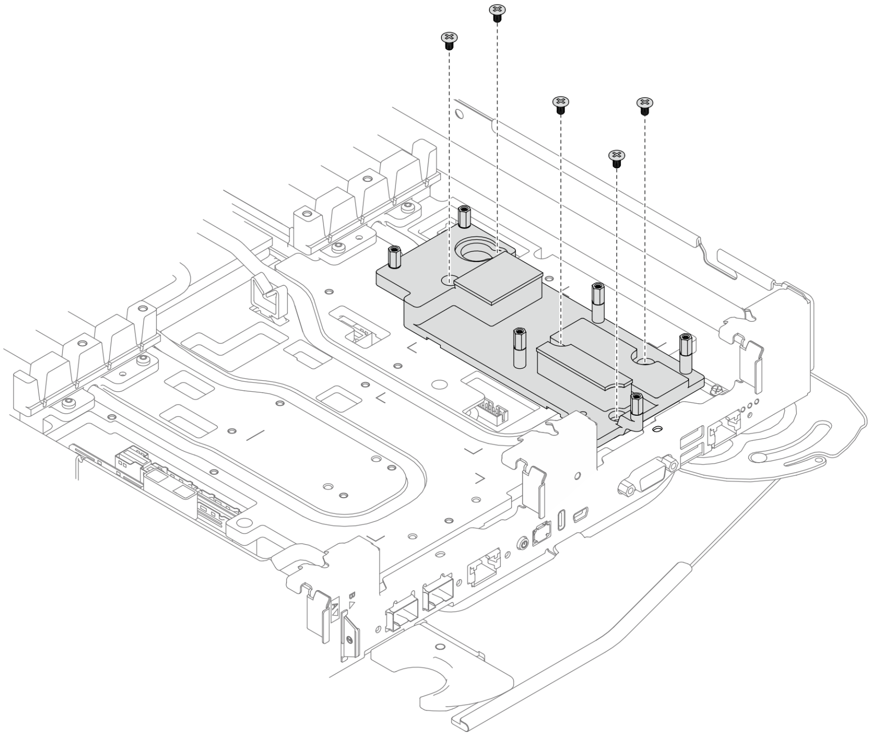


Figure 99. ConnectX-8 riser assembly interface plate installation

Step 5. Replace the single-use gap pad on the interface plate with a new one. Make sure to follow Gap pad/putty pad replacement guidelines.

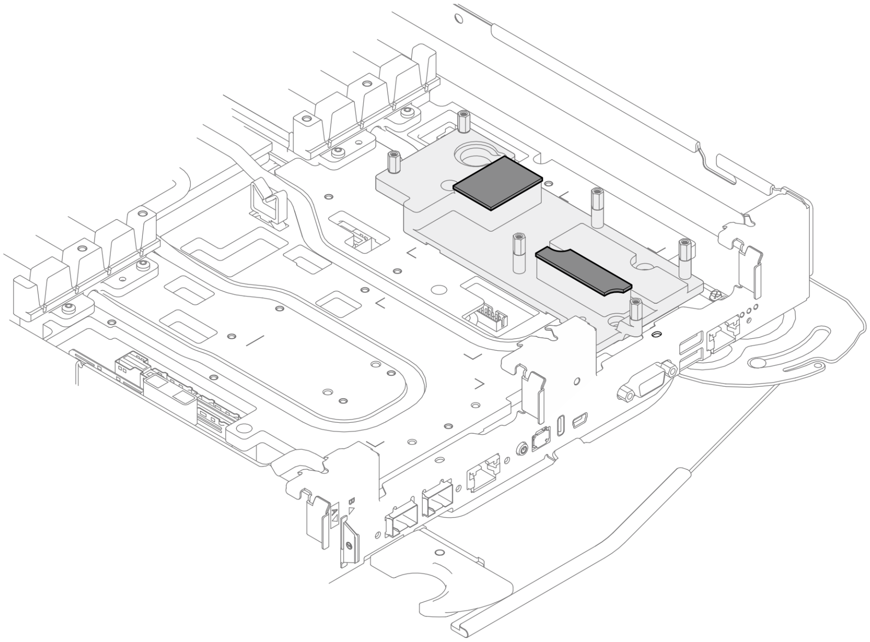


Figure 100. ConnectX-8 riser assembly interface plate single-use gap pad

Step 6. Install the ConnectX-8 riser assembly.

a. ① Install the ConnectX-8 riser assembly to the water loop.

b. ② Install six T6 screws to screw holes marked with **C** on the riser cage. Install the screws with a torque screwdriver set to the proper torque.

c. ③ Fasten the captive screw to secure the riser assembly to the water loop.

Note: For reference, the torque required for the screws to be fully tightened/removed is 3+/- 0.5 lbf-in.

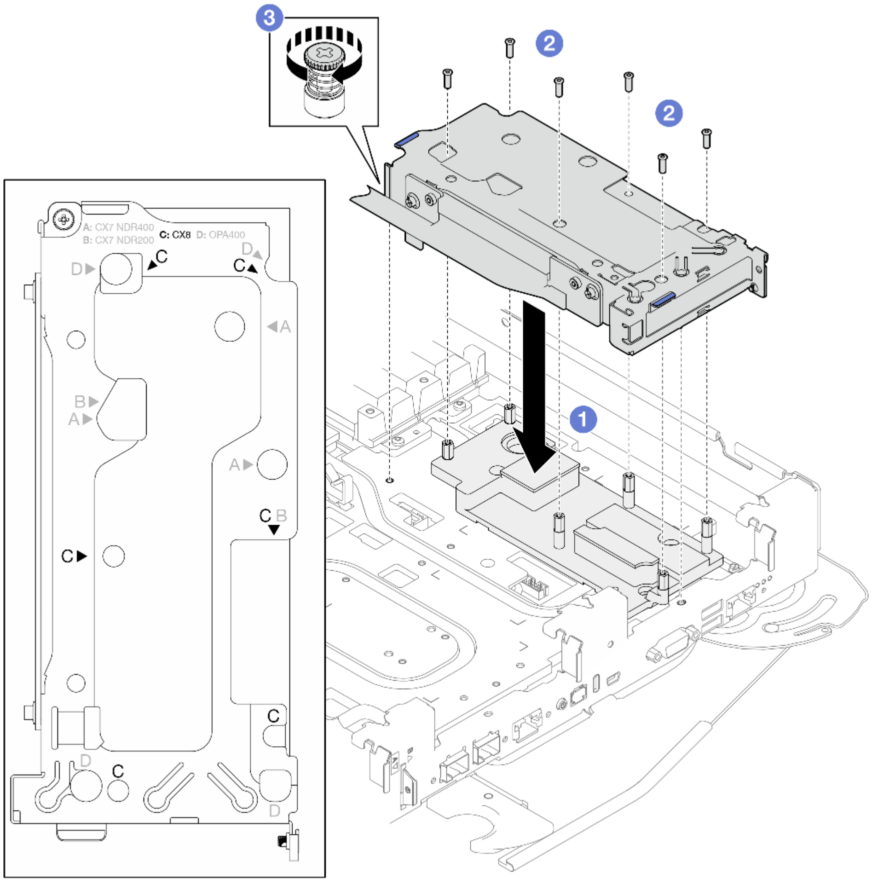


Figure 101. Installing ConnectX-8 riser assembly

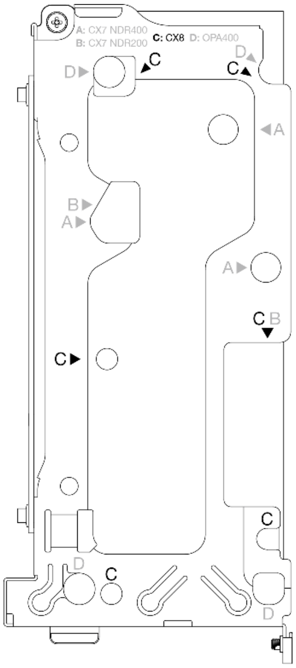


Figure 102. Screw holes marked with C on the riser cage

After you finish

1. Connect the PCIe adapter cables to the system board. See ***Internal Cable Routing Guide***.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Installing studs to ConnectX-8 interface plate

When installing a new interface plate to the node, or when there are no studs present on the interface plate, install the studs (six) to the interface plate before installing the screws. Note that the screws must be installed to the studs on the interface plate.

Cross braces replacement

Use the following procedures to remove and install the cross braces in the tray.

Remove the cross braces

Use this information to remove the cross braces.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

   a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

   b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove the front and the rear cross braces (30x PH1 screws).

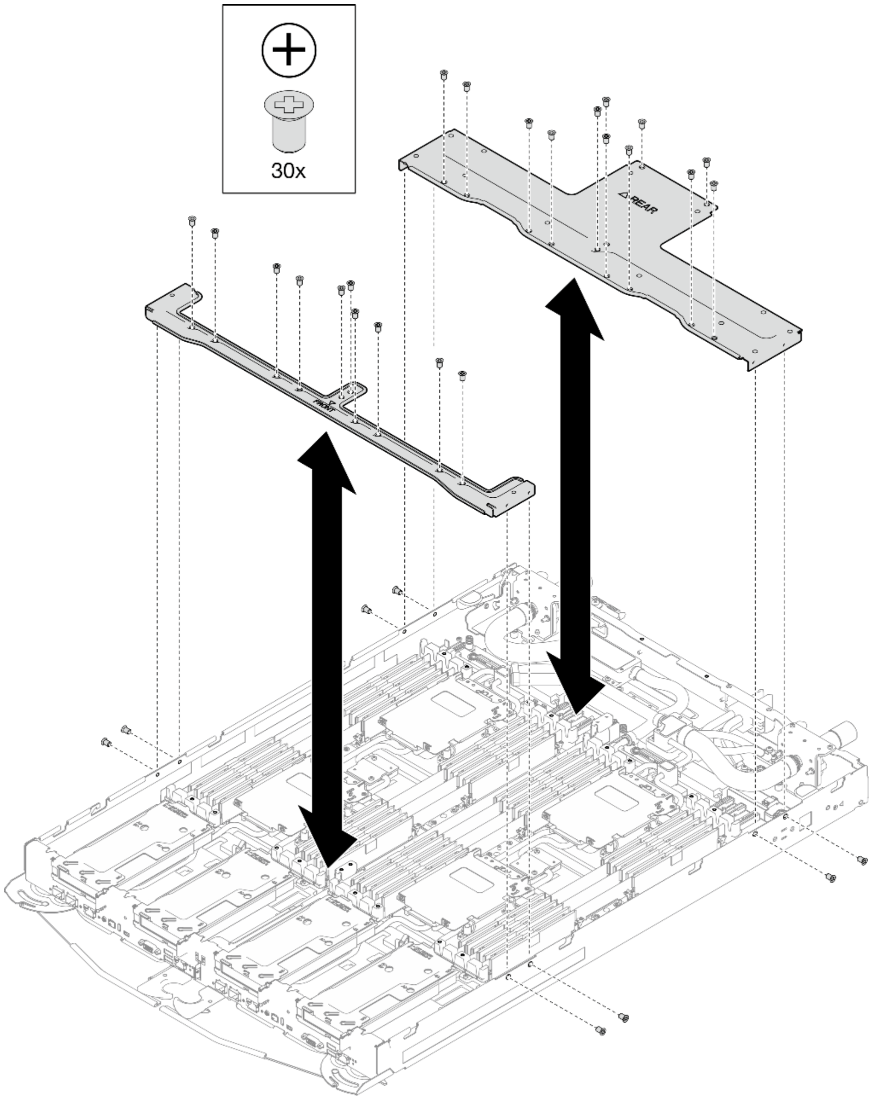


Figure 103. Front and rear cross braces removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the cross braces

Use this information to install the cross braces.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- The system supports two types of front cross bars, as **1** and **2** shown in the illustration below, with the triangle marks pointing out their differences. Make sure to use front cross bar **2** if the system operates the **Connect-X 8 shared I/O configuration**.

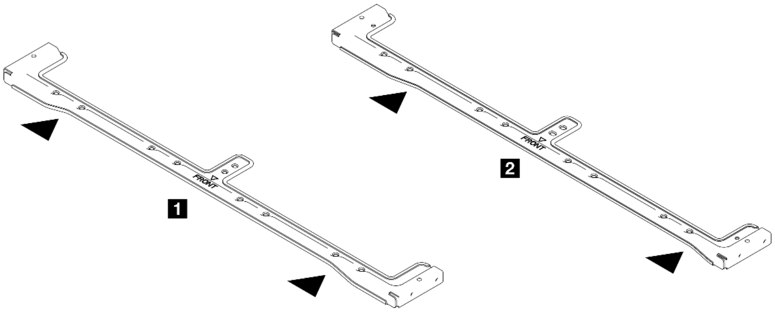


Figure 104. Front cross bar types

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Place the front and rear cross braces to the tray.

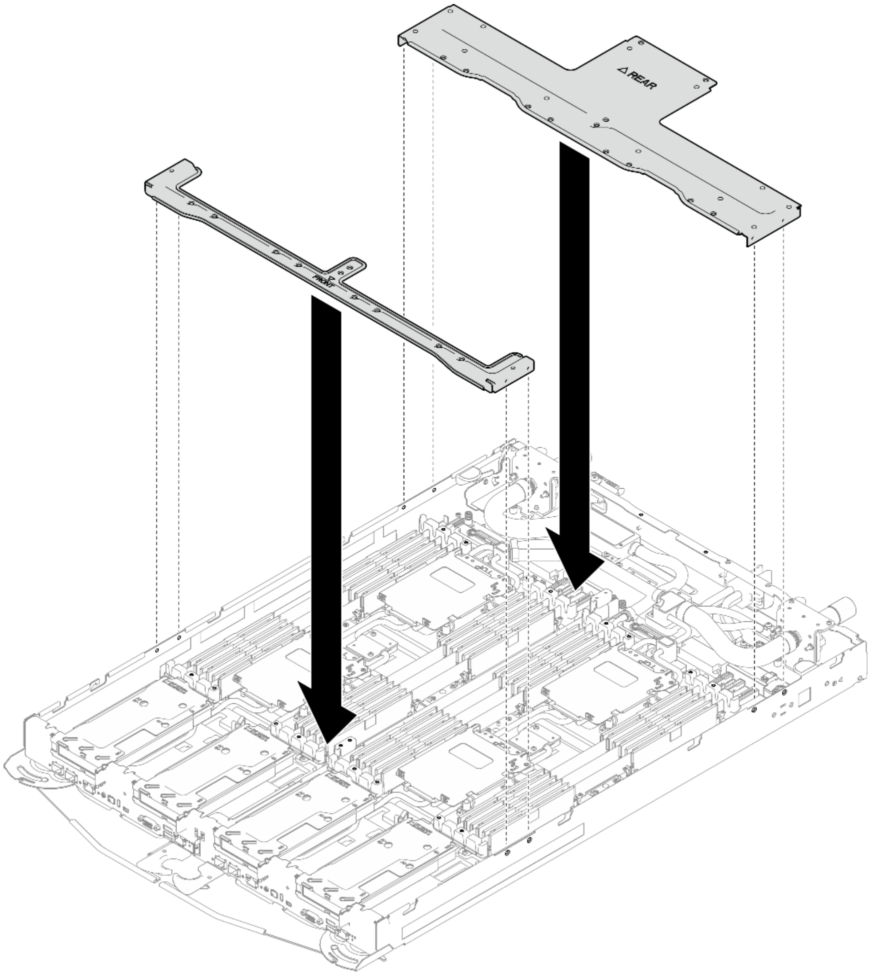


Figure 105. Placing the cross braces to the tray

Step 2. Install the front and rear cross braces to the tray.

a. Install 18x PH1 screws to secure the cross braces.

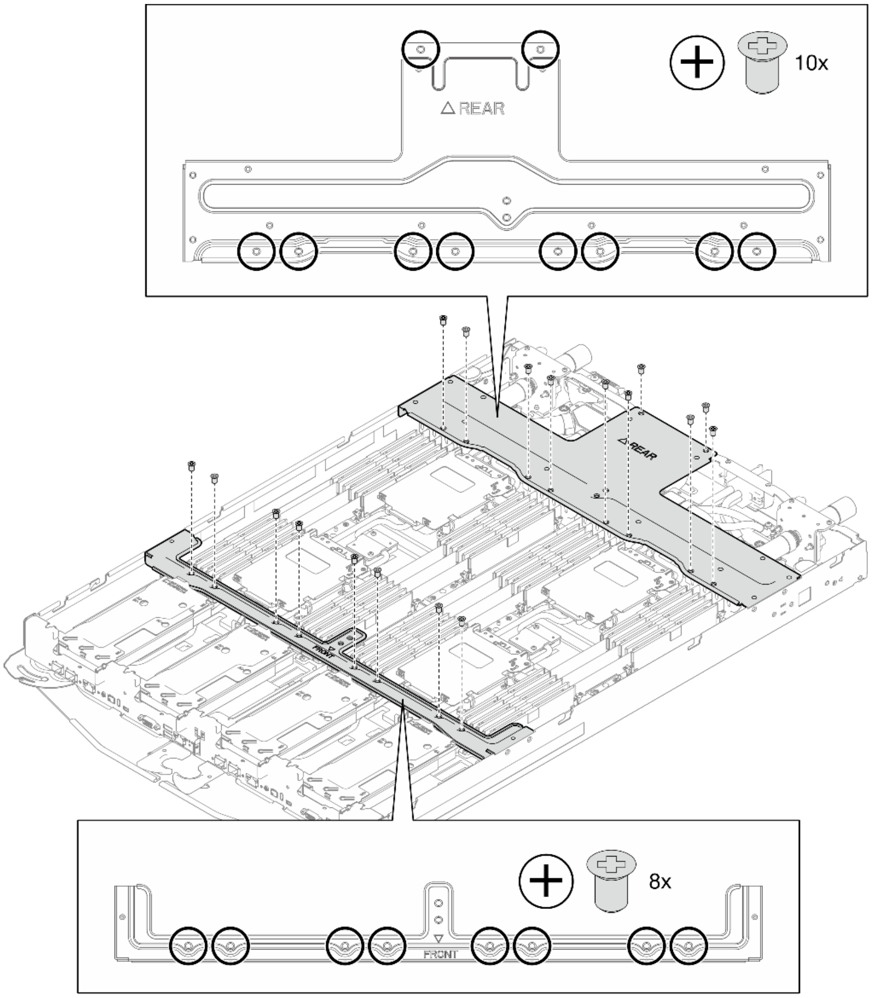


Figure 106. Front and rear cross braces installation (18x screws)

b. Fasten 12x PH1 screws to install the cross braces.

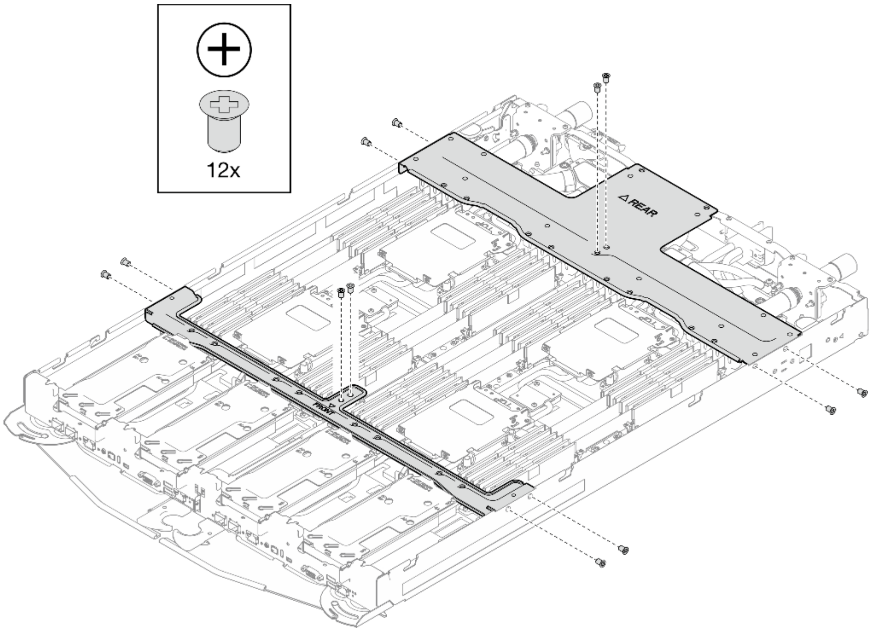


Figure 107. Front and rear cross braces installation (12x screws)

After you finish

1. Install the tray cover. See “Install the tray cover” on page 373.
2. Install the tray into the enclosure. See “Install a tray in the enclosure” on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see “PCIe adapter cable routing” in *SC750 V4 Cable Routing Guide*.

DIMM comb replacement

Use the following procedures to remove and install a DIMM comb.

Remove a DIMM comb

Use this information to remove a DIMM comb.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove the memory module tool attached to the DIMM comb.

Note: Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

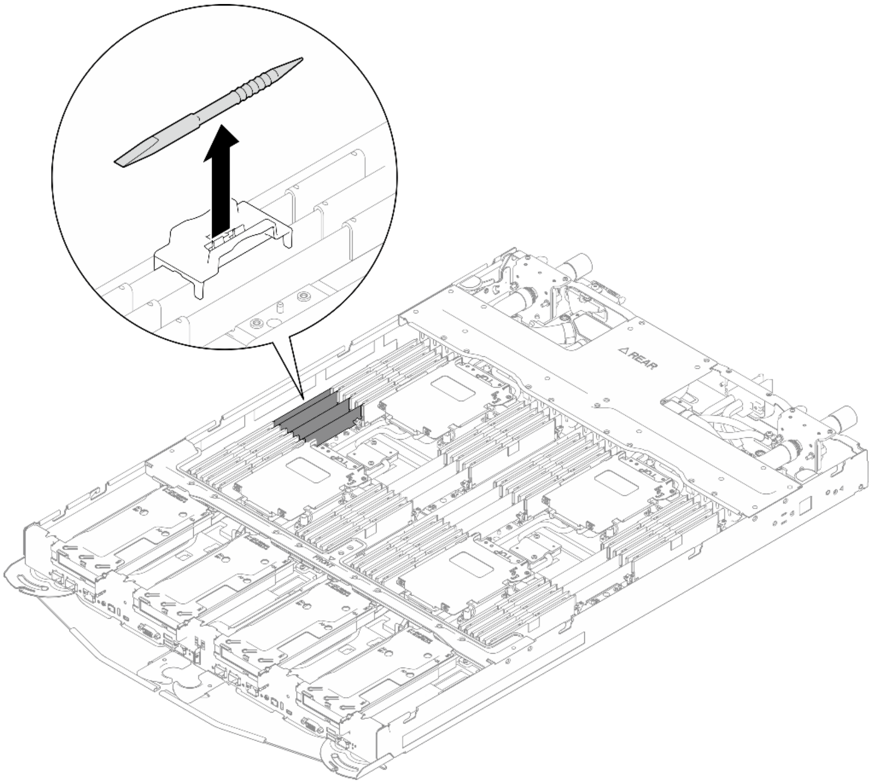


Figure 108. Memory module tool removal

Step 3. Gently hold the DIMM comb and removal it out of the chassis.

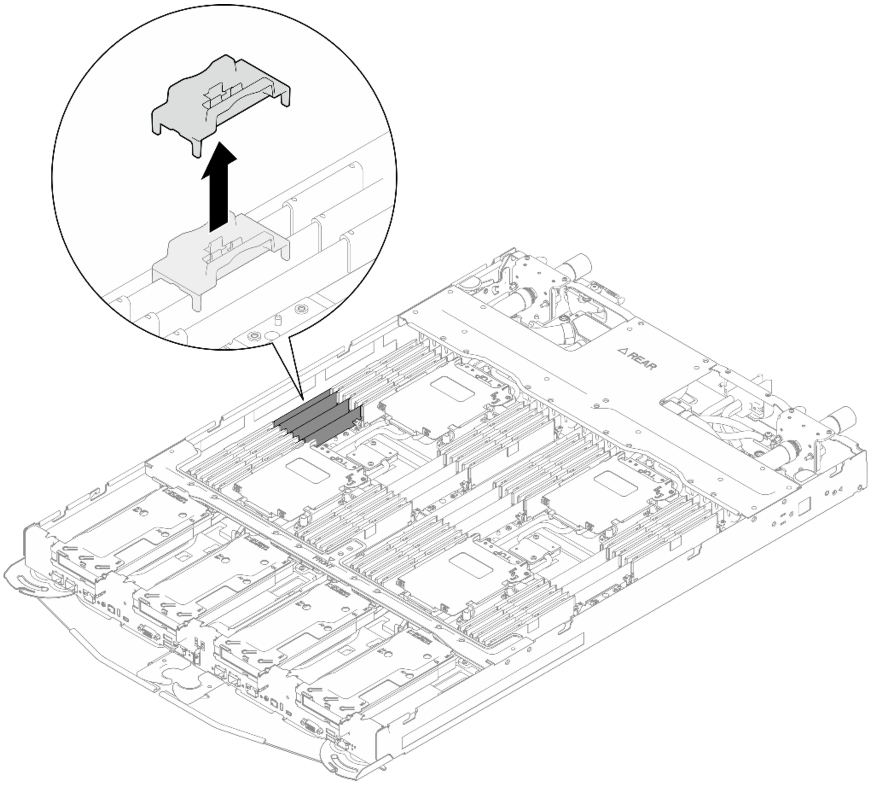


Figure 109. DIMM comb removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a DIMM comb

Use this information to install a DIMM comb.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Note: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Align the DIMM comb with the slots and insert it into the node.

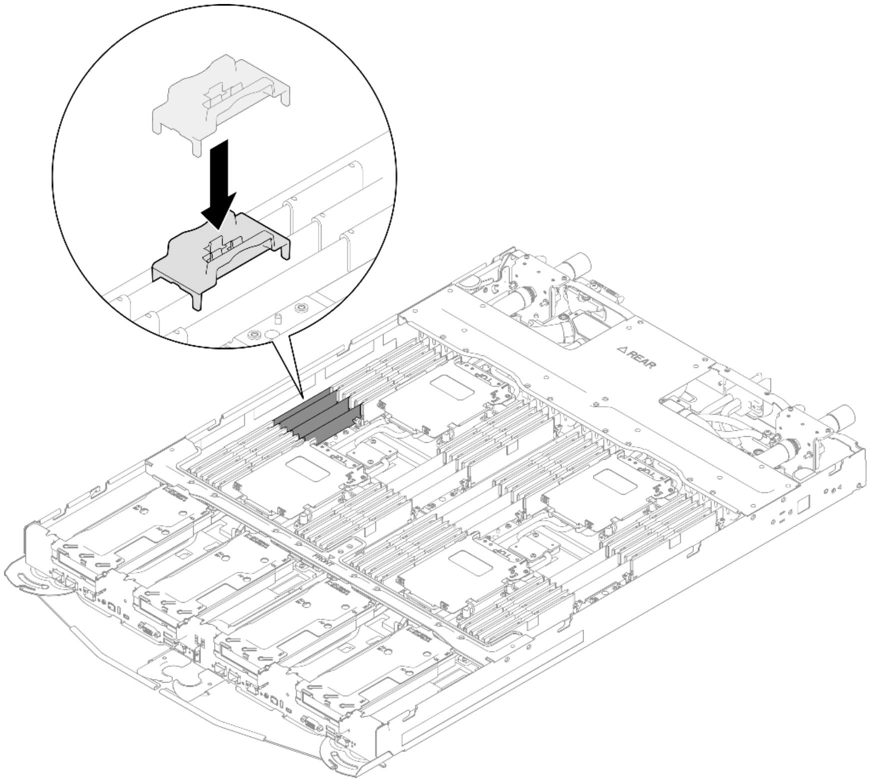


Figure 110. DIMM comb installation

Step 2. Install the memory module tool to the DIMM comb.

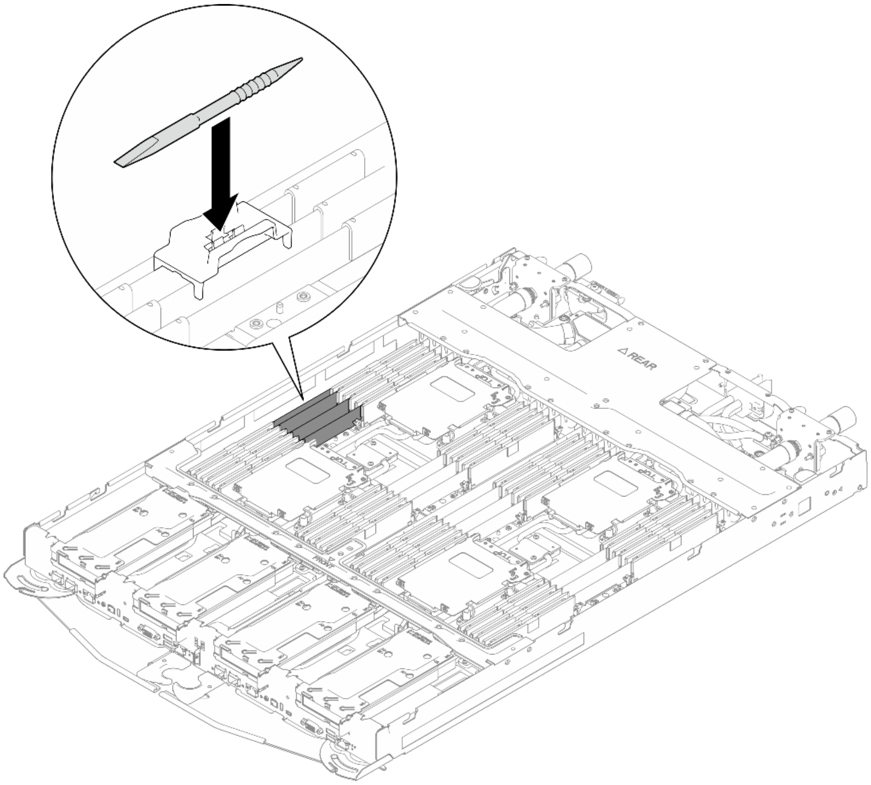


Figure 111. Memory module tool installation

After you finish

1. Install the tray cover. See "Install the tray cover" on page 373.
2. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

DIMM cooling bar replacement (for dual-side cooling memory modules)

Use the following procedures to remove and install a DIMM cooling bar. The DIMM cooling bars are required for dual-side cooling memory modules.

Remove a DIMM cooling bar

Use this information to remove a DIMM cooling bar.

About this task

Required tools

- Screwdriver for T10 screws
- Storage Gap Pad Kit (SC750 V4) and Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.

- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Conduction Plate , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the DIMM comb. See "Remove a DIMM comb" on page 112.

d. Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

g. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

Step 2. Remove the DIMM cooling bar. Make sure to remove all DIMM cooling bars from the water loop.

a. ① Remove two T10 screws from the cooling bar.

b. ② Insert a flat head screwdriver into the slots on the ends of the cooling bar; then, slightly lift up the screwdriver to loosen the cooling bar from the water loop.

c. ③ Remove the cooling bar from the water loop.

Attention: To remove water loop, make sure to remove all DIMM cooling bars (x16 per tray) from the water loop.

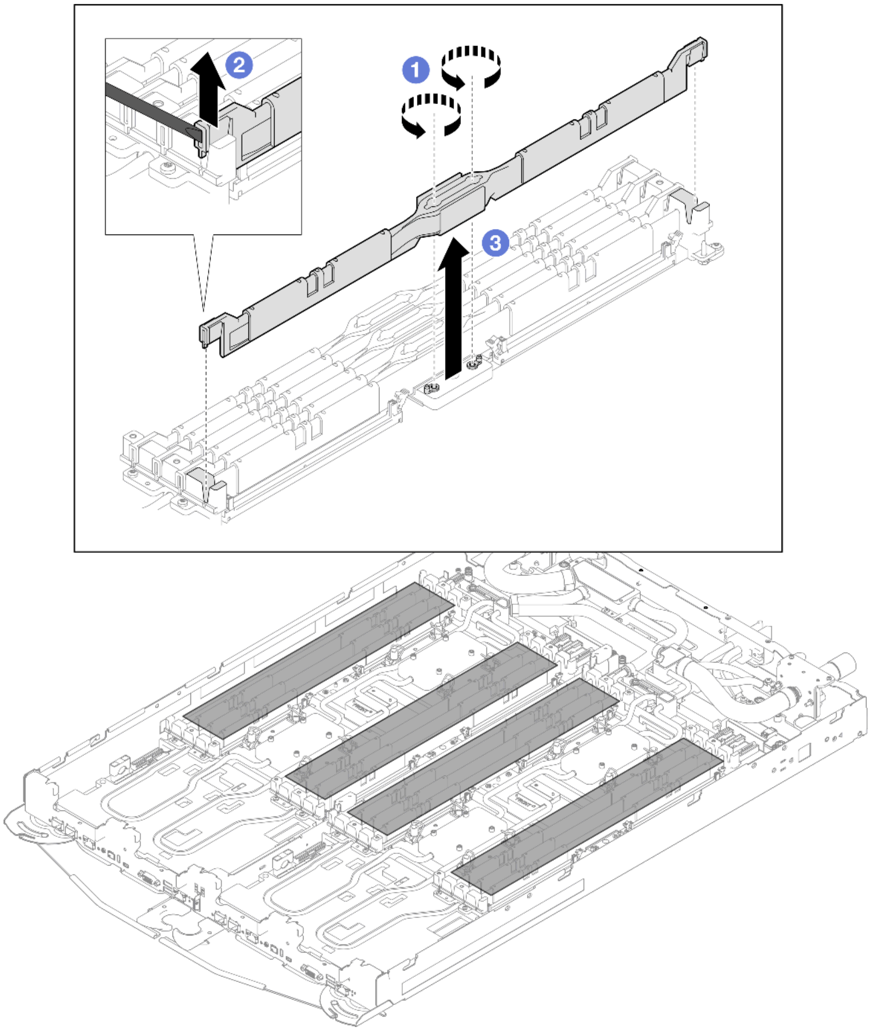


Figure 112. Removing DIMM cooling bars

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a DIMM cooling bar

Use this information to install a DIMM cooling bar. **The DIMM cooling bars are required for dual-side cooling memory modules.**

About this task

Required tools

- Screwdriver for T10 screws
- Storage Gap Pad Kit (SC750 V4) and Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Conduction Plate , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Note: If the system was installed with single-side cooling memory modules. Remove all the DIMM covers from the water loop; then, remove the cross bars, see “Remove the cross braces” on page 108.

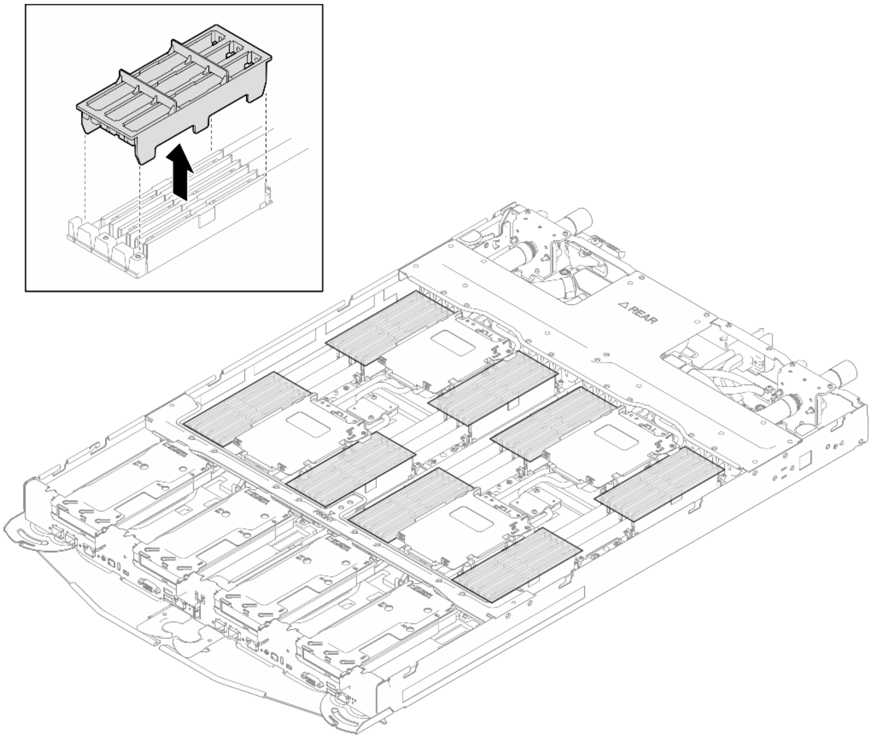


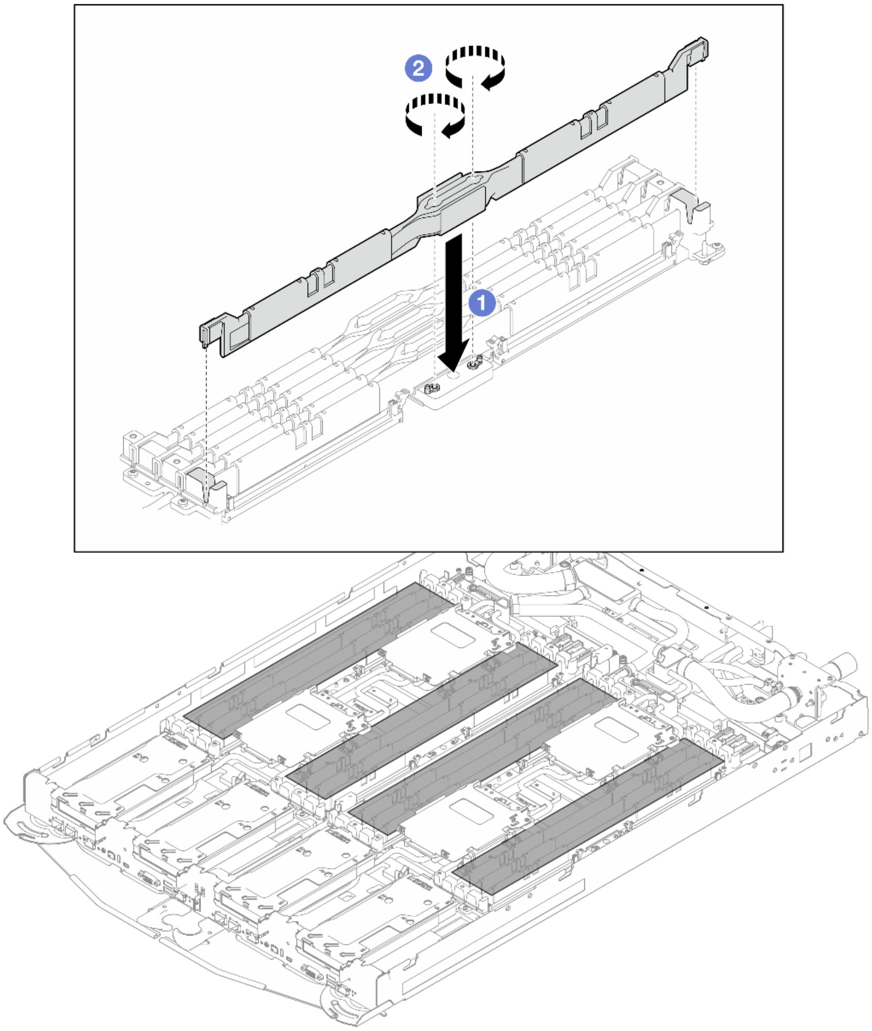
Figure 113. Removing DIMM cover

Step 1. Install the DIMM cooling bars.

a. ① Install the DIMM cooling bar into the water loop.

b. ② Install two T10 screws to secure the DIMM cooling bar to the water loop.

Attention: Make sure eight cooling bars are installed in each node. A total of sixteen cooling bars should be installed in the tray.



After you finish

1. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
2. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
3. Install the cross braces. See "Install the cross braces" on page 109.
4. Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
5. Install the DIMM comb. See "Install a DIMM comb" on page 114.
6. Install the tray cover. See "Install the tray cover" on page 373.
7. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
8. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
9. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

E3.S front drive cage assembly replacement

Use the following procedures to remove and install an E3.s front drive cage assembly.

Remove an E3.S front drive cage assembly

Use this information to remove an E3.S front drive cage assembly.

About this task

Required tools

- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)
- Storage Gap Pad Kit (SC750 V4)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

Step 2. Remove the blank filler from the slot installed with the drive cage.

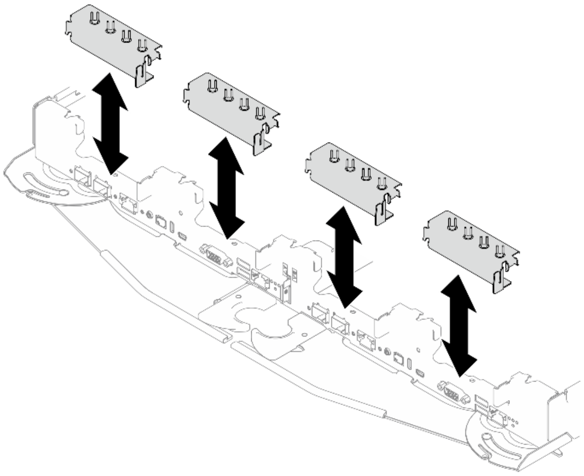


Figure 114. Removing blank bezel filler

Step 3. Disconnect the cables from the system board.

Step 4. Remove the E3.S front drive cage assembly.

  a. ① Loosen three captive screws.

  b. ② Remove the E3.S front drive cage assembly.

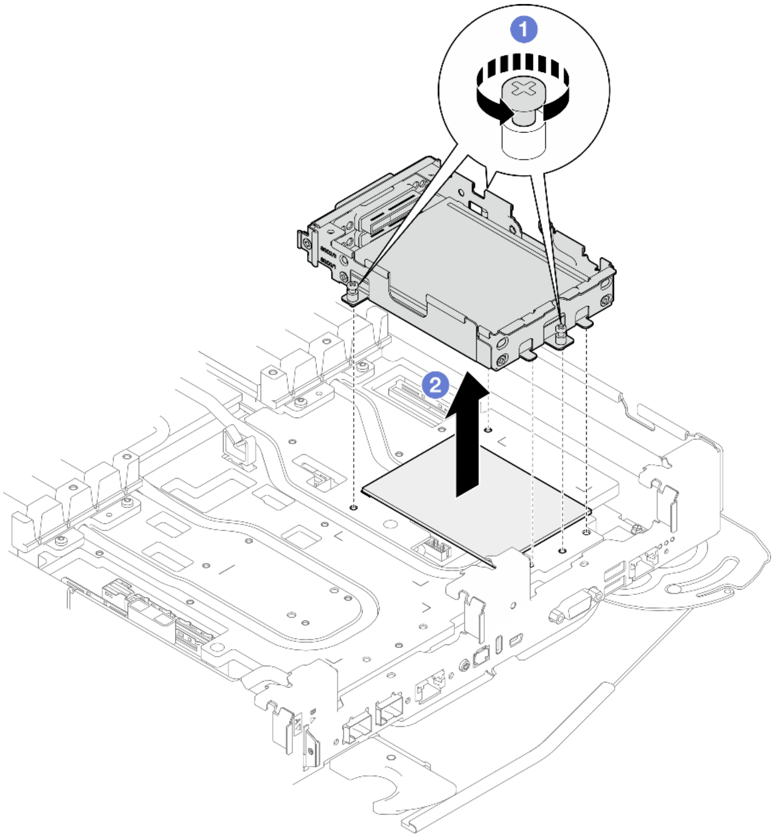


Figure 115. Removing E3.S front drive cage assembly

Note: To help removing the drive cage, insert a flat head screwdriver into the gaps between the drive cage and the water loop; then, rotate the screwdriver to release the drive cage from the water loop.

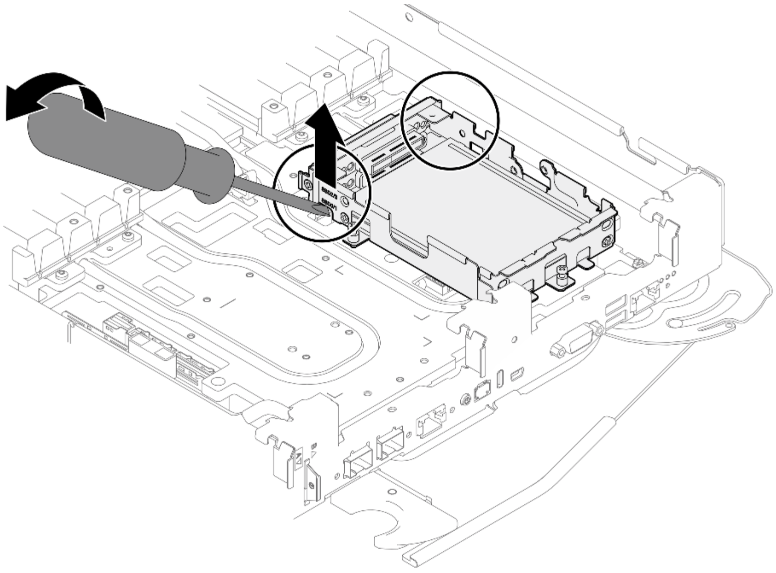


Figure 116. Releasing E3.S front drive cage from water loop

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

If necessary, remove the gap pads from the water loop.

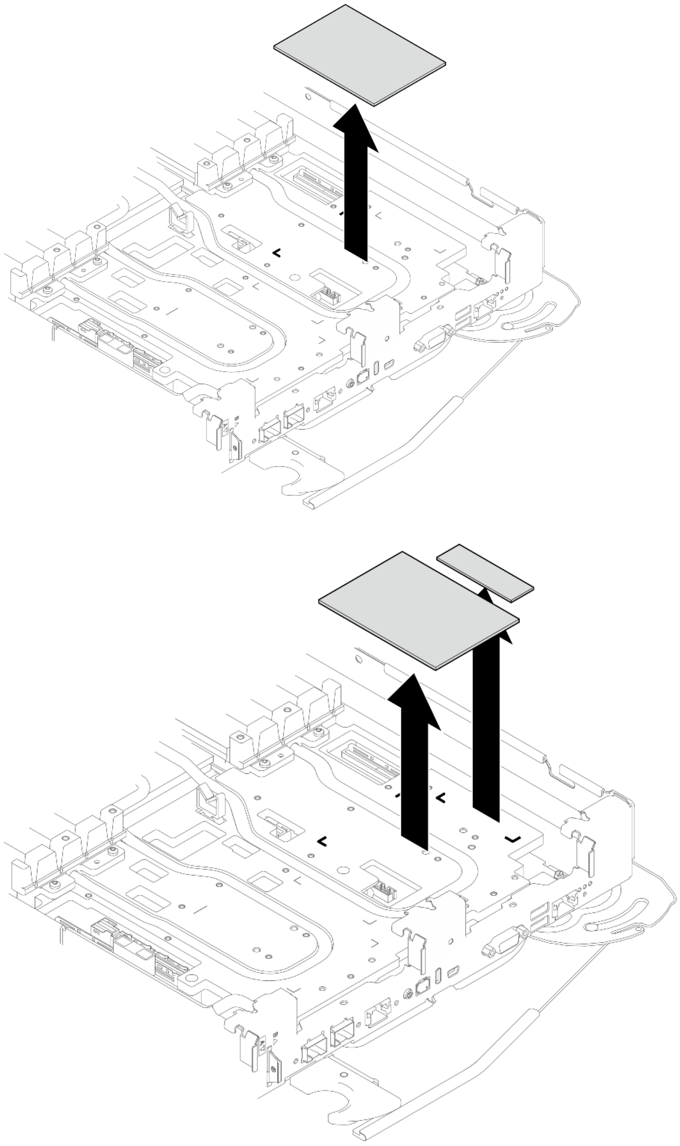


Figure 117. Removing gap pads

Install an E3.S front drive cage assembly

Use this information to install an E3.S front drive cage assembly.

About this task

Required tools

- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)
- Storage Gap Pad Kit (SC750 V4)

Important: Gap pad replacement guidelines
- For gap pad location and instruction, see “Gap pad identification and location” on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. If the E3.S drive cage gap pad is damaged or detached, replace it with new ones. Make sure to follow Gap pad/putty pad replacement guidelines.

Note: Align the gap pad with marking on water loop when attaching gap pad. The table below specifies gap pad required for different drive configurations.

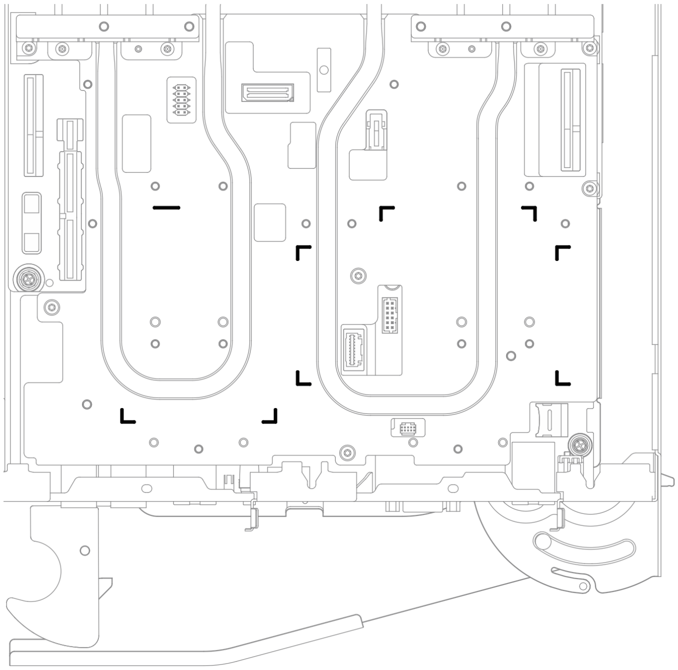


Figure 118. Markings on water loop for E3.S gap pad alignment

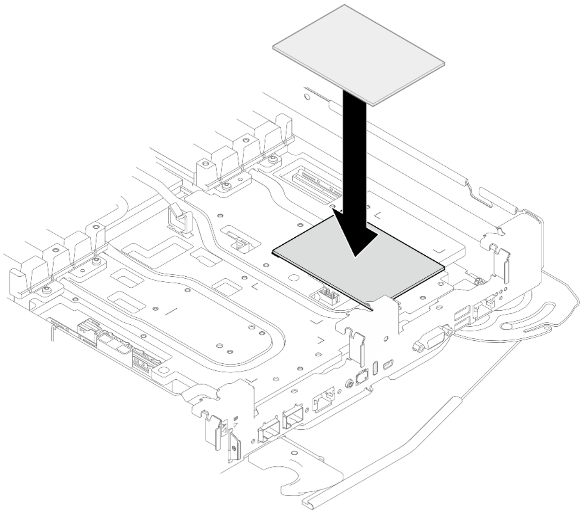


Figure 119. Gap pads location for E3.S 1T single front drive

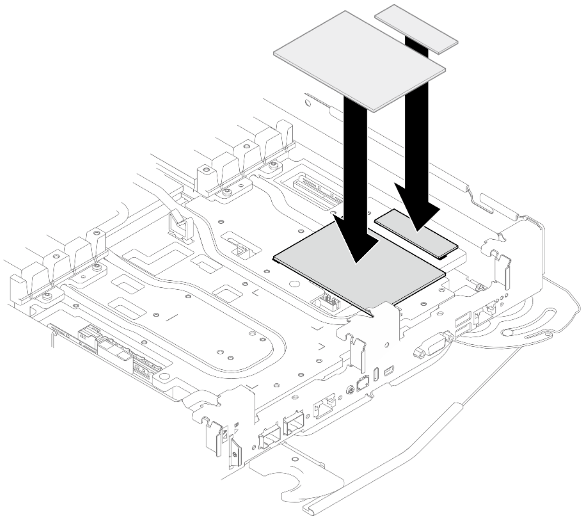


Figure 120. Gap pads location for E3.S 1T dual front drives and E3.S 2T single front drive

Step 2. Install the E3.S drive cage assembly.

a. ❶ Install the E3.S drive cage assembly into the node.

b. ❷ Secure the three captive screws.

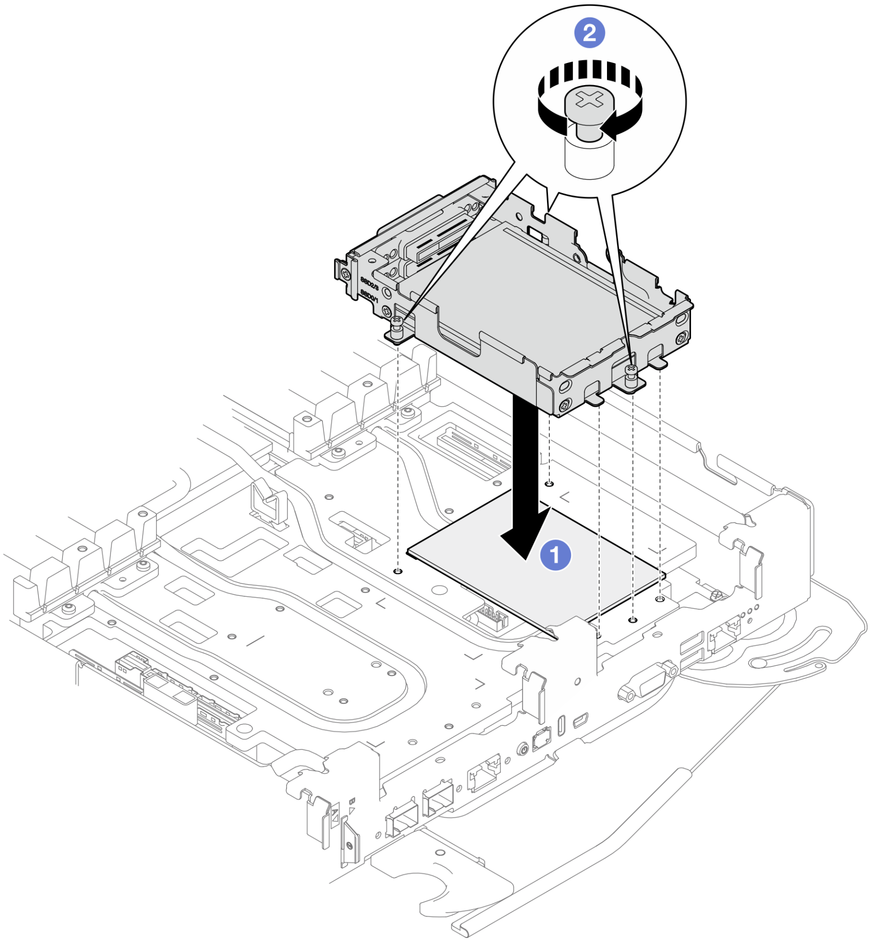


Figure 121. Installing front E3.S drive cage assembly

Step 3. Install the blank bezel filler to the slot installed with the drive cage.

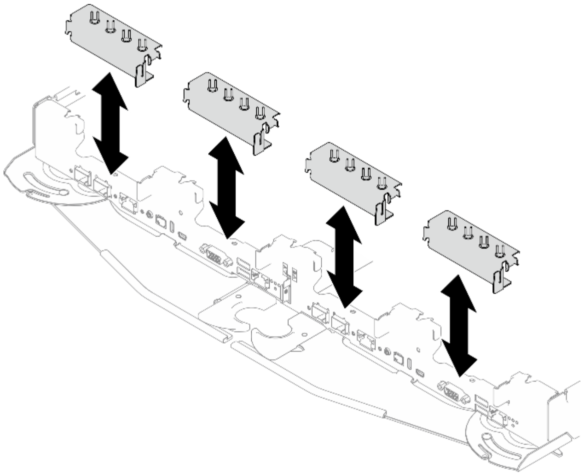


Figure 122. Blank bezel filler removal

After you finish

1. Connect the cables to the system board. See ***Internal Cable Routing Guide***..

2. Install the cross braces. See “Install the cross braces” on page 109.
3. Install the tray cover. See “Install the tray cover” on page 373.
4. Install the tray into the enclosure. See “Install a tray in the enclosure” on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see “PCIe adapter cable routing” in *SC750 V4 Cable Routing Guide*.

E3.S 1T single front drive replacement

Use the following procedures to remove and install an E3.S 1T single front drive.

Remove an E3.S 1T single front drive

Use this information to remove an E3.S 1T single front drive.

About this task

Required tools

- Screwdriver for PH 1 screws

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

   a. Remove the tray from the enclosure. See “Remove a tray from the enclosure” on page 332.

   b. Remove the tray cover. See “Remove the tray cover” on page 372.

   c. Remove the cross braces. See “Remove the cross braces” on page 108.

   d. Remove the front E3.S drive cage. see “Remove an E3.S front drive cage assembly” on page 121.

Step 2. Remove the cable retainer from the drive cage.

   a. Remove the two PH1 screws from the drive cage.

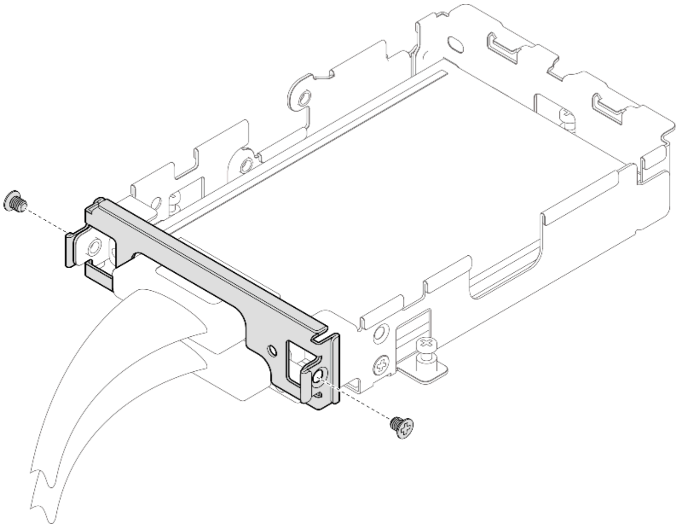


Figure 123. Removing screws from cable retainer

b. Remove the cable retainer. (**1** Top-side cooling drive, **2** Bottom-side cooling drive)

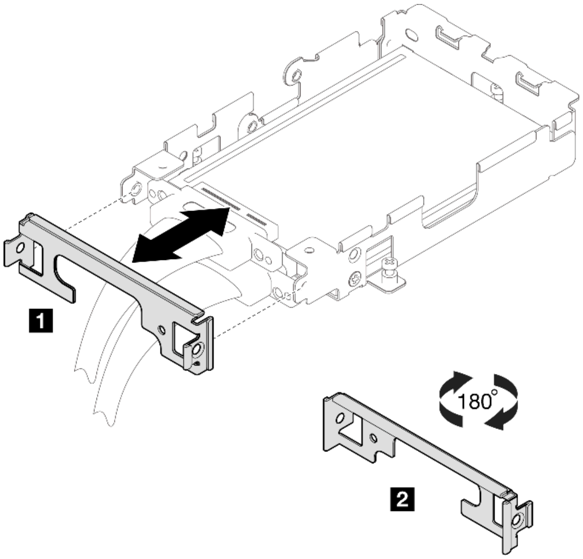


Figure 124. Removing the cable retainer

Step 3. Disconnect the cable from the drive.

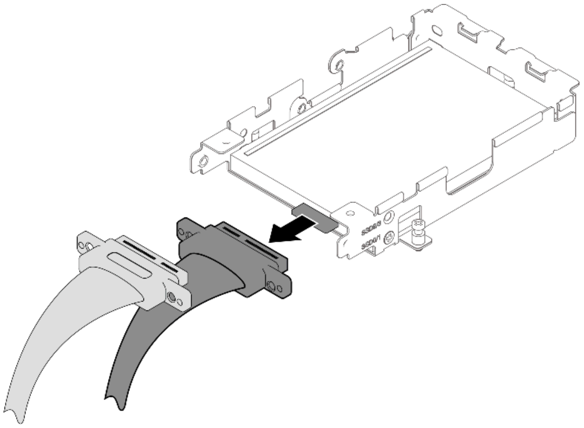


Figure 125. Disconnect the cable from the drive

Step 4. Remove the four PH 1 screws from the drive cage.

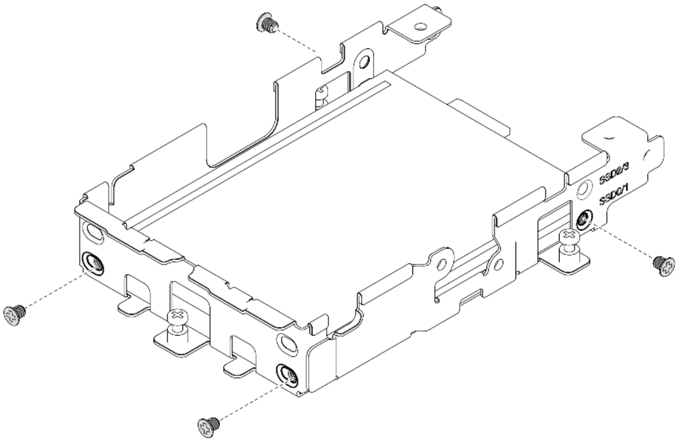


Figure 126. Removing screws from the drive cage.

Step 5. Remove the drive from the drive cage.

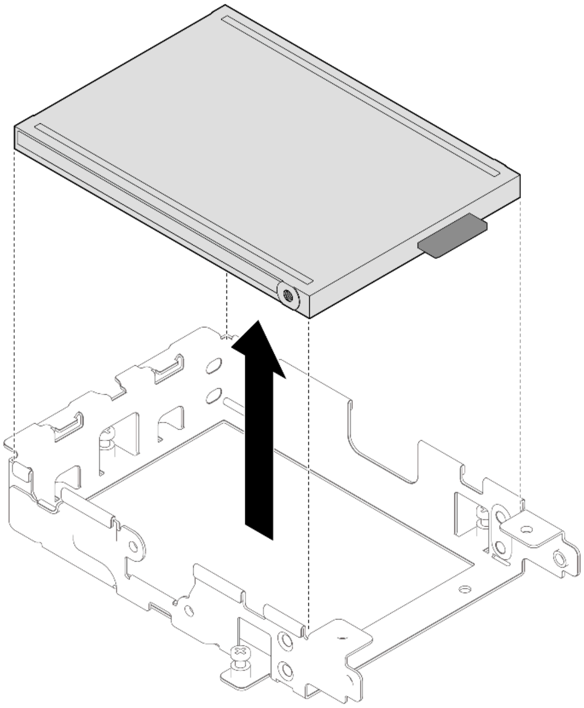


Figure 127. Removing the drive from the drive cage

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an E3.S 1T single front drive

Use this information to install an E3.S 1T single front drive.

About this task

Required tools

- Screwdriver for PH 1 screws

Important: Gap pad replacement guidelines
- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install the drives to the drive cage.

Attention: Drive connector orientation is different for top-side cooling drive and bottom-side cooling drive. Make sure to follow the drive connector orientation guidance specified in the illustrations below.

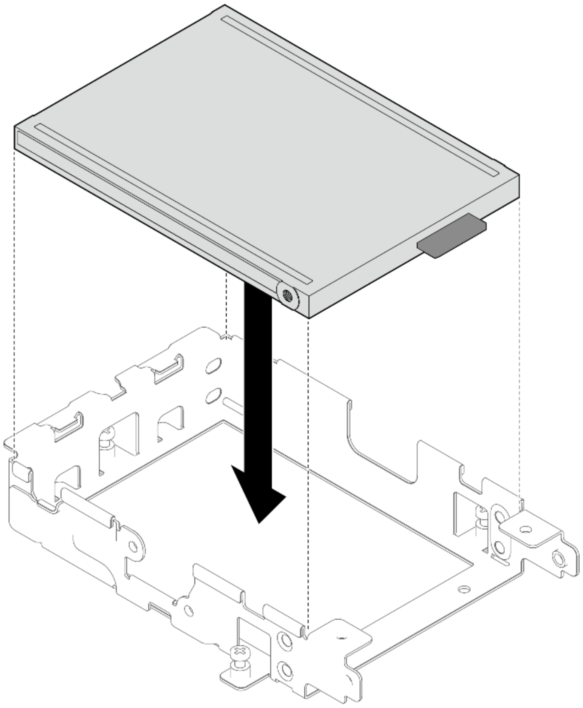


Figure 128. Installing top-side cooling drive

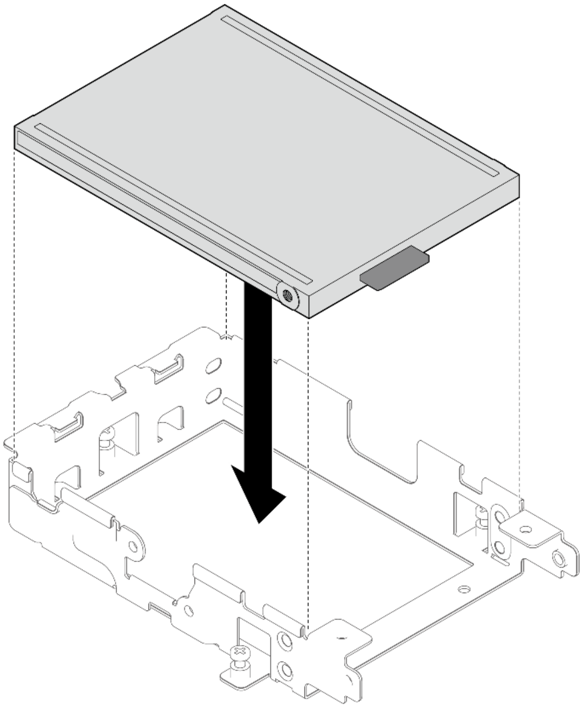


Figure 129. Installing bottom-side cooling drive

Step 2. Installing the four PH1 screws to secure the drive to the drive cage.

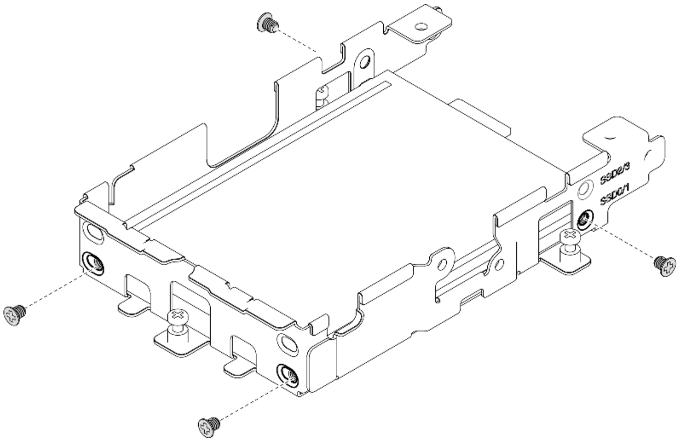


Figure 130. Installing four screws to secure the drive to the drive cage.

Step 3. Connect the cable to the drive.

a. ① Connect the cable with plugger marked as **0** or **1** to the drive.

b. ② Place the other cable plugger on top of the connected plugger.

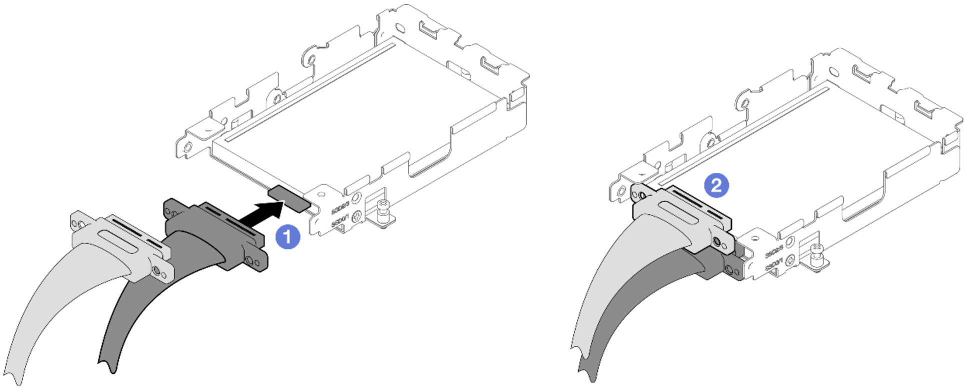


Figure 131. Connecting cable to drive

Step 4. Install the cable retainer to the drive cage.

a. Attach the cable retainer to the drive cage.

Attention:

- For **top-side cooling** drive, orient the cable retainer as **1** shown in the illustration below.
- For **bottom-side cooling** drive, orient the cable retainer as **2** shown in the illustration below.

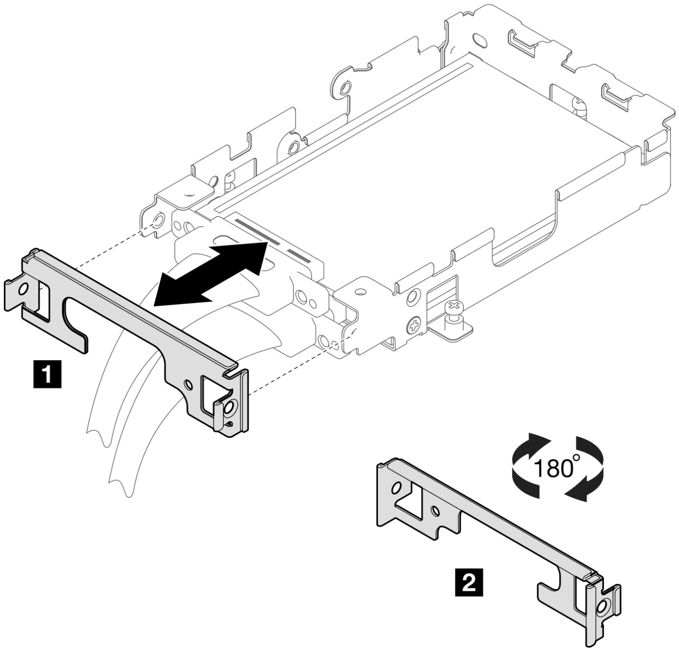


Figure 132. Installing cable retainer to the drive cage

b. Fasten two PH1 screws to secure the cable retainer to the drive cage.

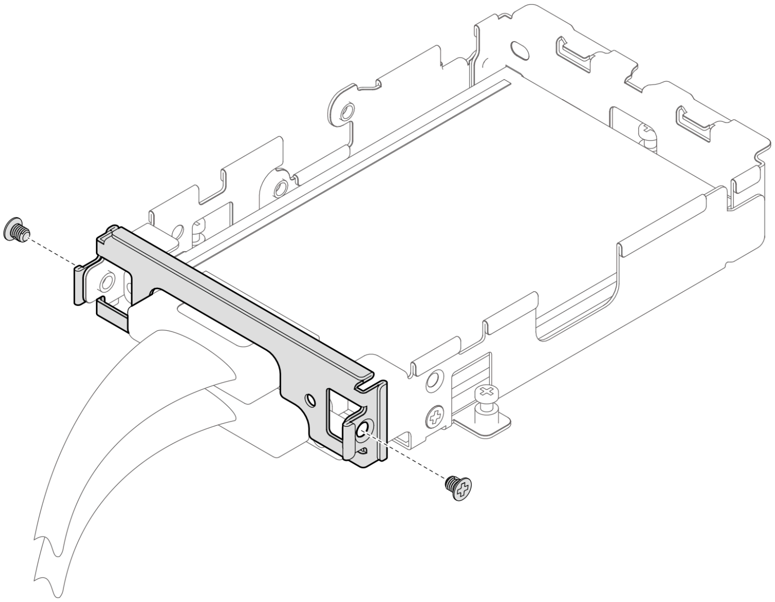


Figure 133. Installing screws to the cable retainer

After you finish

1. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

Note: Use extra force to connect QSFP cables to the solution.

6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

E3.S 1T dual front drive replacement

Use the following procedures to remove and install E3.S 1T dual front drives.

Remove E3.S 1T dual front drive

Use this information to remove E3.S 1T dual front drives.

About this task

Required tools

- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)
- Storage Conduction Plate (if installing the E3.S 1T dual front drive for the first time)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

   a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

   b. Remove the tray cover. See "Remove the tray cover" on page 372.

   c. Remove the cross braces. See "Remove the cross braces" on page 108.

   d. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

Step 2. Remove the cable retainer from the drive cage.

   a. Remove two PH 1 screws from the drive cage.

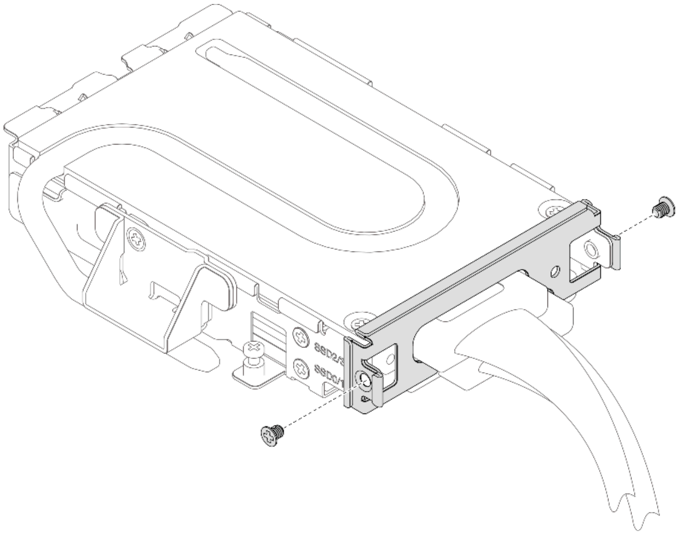


Figure 134. Removing screws from the cable retainer

b. Remove the cable retainer. (**1** Top-side cooling drive, **2** Bottom-cooling drive)

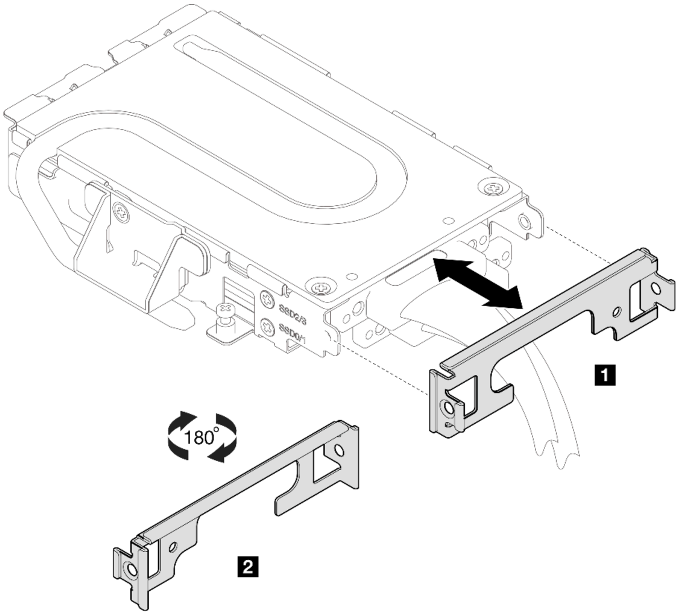


Figure 135. Remove the cable retainer

Step 3. Disconnect the cable from the drives.

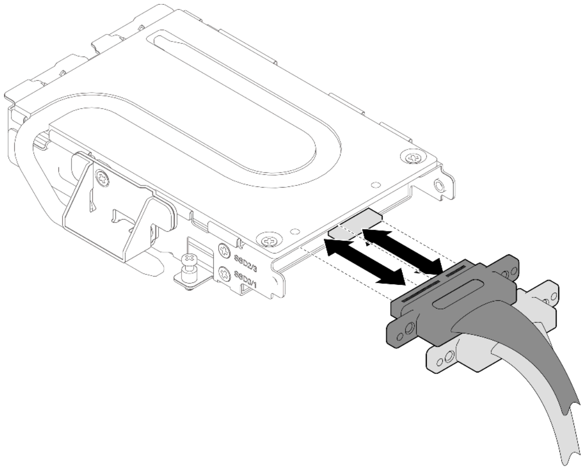


Figure 136. Disconnect the cable from the drives

Step 4. Remove two PH1 screws to remove the side holder from the drive cage.

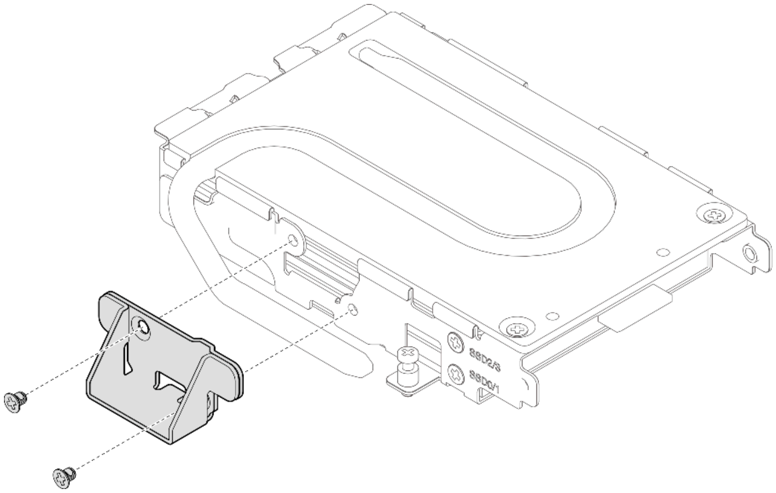


Figure 137. Removing the side holder

Step 5. Remove the two PH1 screws from the heat sink.

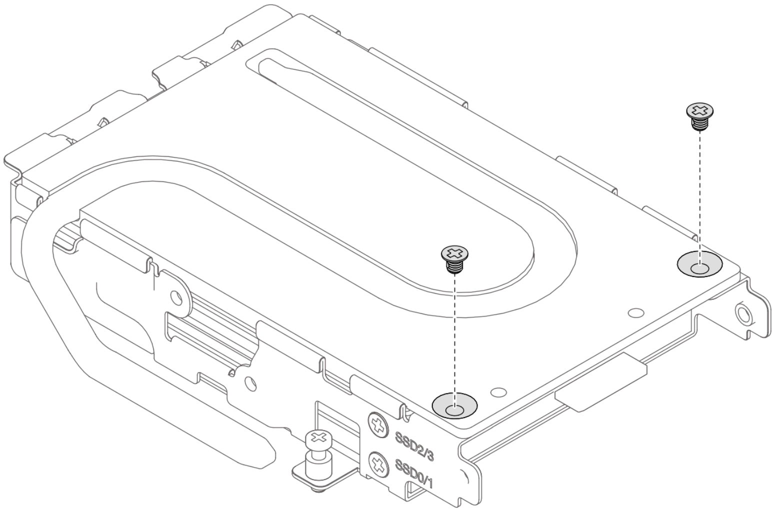


Figure 138. Removing screws from heat sink

Step 6. Remove the heat sink.

a. ① Rotate the heat sink until it is positioned at an angle.

b. ② Remove the heat sink from the drive cage.

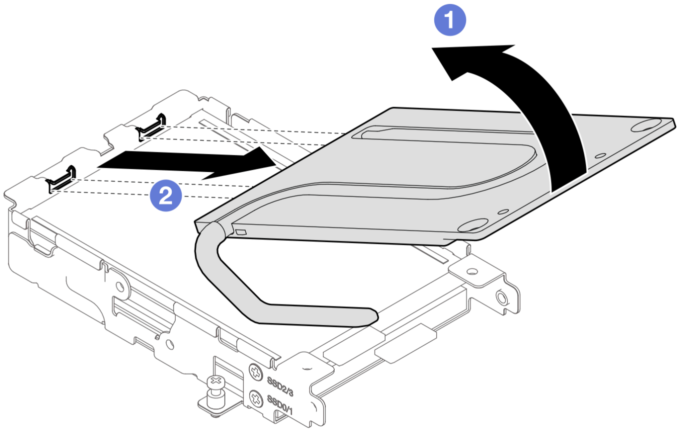


Figure 139. Removing the heat sink

Step 7. Remove the eight PH1 screws from the drive cage

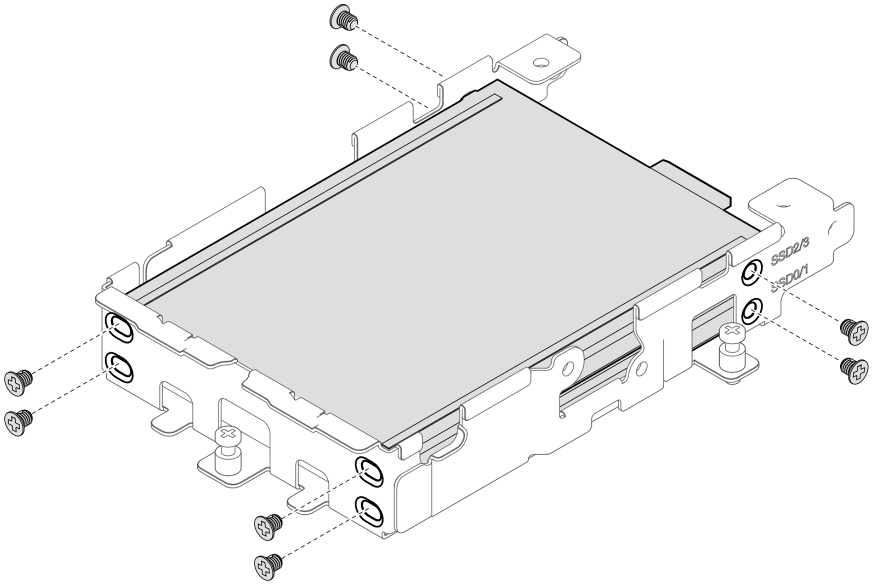


Figure 140. Removing the screws from the drive cage

Step 8. Remove the drives from the drive cage.

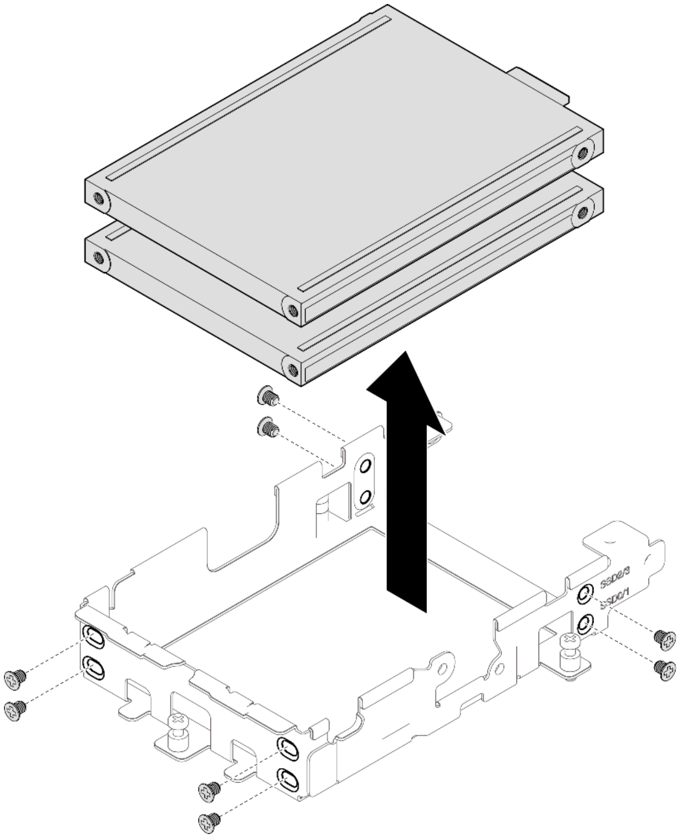


Figure 141. Removing the drives from the drive cage

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install E3.S 1T dual front drive

Use this information to install E3.S 1T dual front drives.

About this task

Required tools

- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)
- Storage Conduction Plate (if installing the E3.S 1T dual front drive for the first time)

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Notes:

- For **top-side cooling drives**, see Step 1 on page 140.
- For **bottom-side cooling drives**, see Step 2 on page 142.

Step 1. Install top-side cooling drives. (For installing bottom-side cooling drives, see Step 2 on page 142.)

a. Install the first top-side cooling drive. **Make sure** the drive connector position is the same as shown in the illustration below.

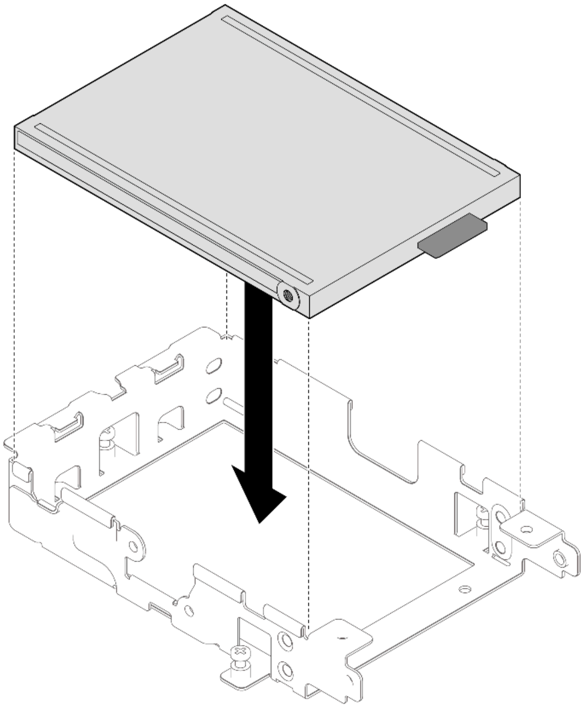


Figure 142. Installing first top-side cooling drive

b. Place the spacer on top of the first drive.

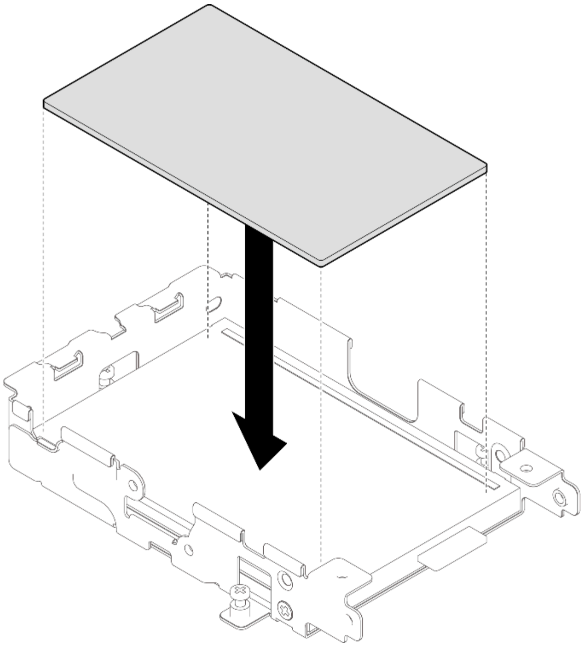


Figure 143. Placing the spacer on the top-side cooling drive

c. Install the second top-side cooling drive to the drive cage. **Make sure** the drive connector position is the same as shown in the illustration below. Afterwards, proceed to Step 3 on page 144.

Note: Pay attention to the drive connector position in the drive cage. The drive connector position of the two drives in the drive cage should be different.

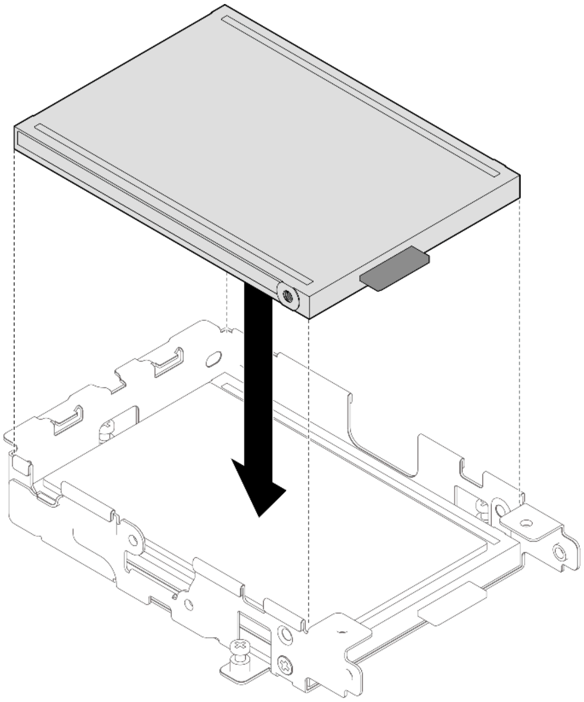


Figure 144. Installing second top-side cooling drive

Step 2. Install bottom-side cooling drives. (For installing top-side cooling drives, see Step 1 on page 140.)

a. Install the first bottom-side cooling drive. **Make sure** the drive connector position is the same as shown in the illustration below.

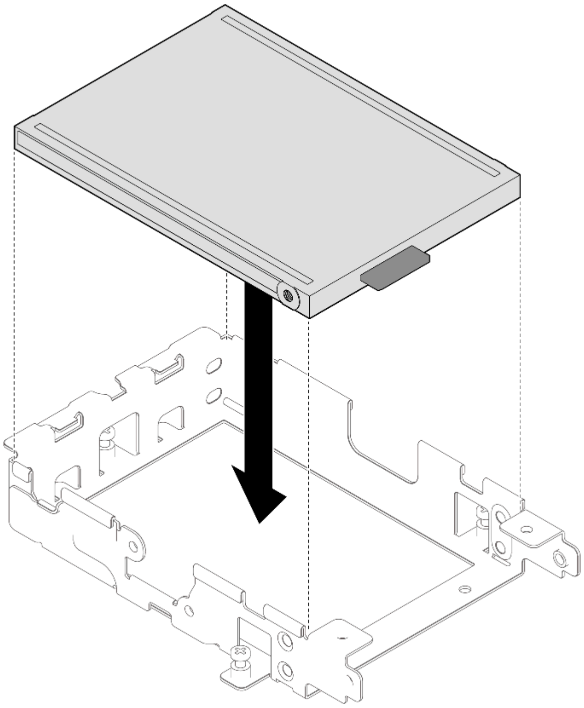


Figure 145. Installing first bottom-side cooling drive

b. Place the spacer on top of the first drive.

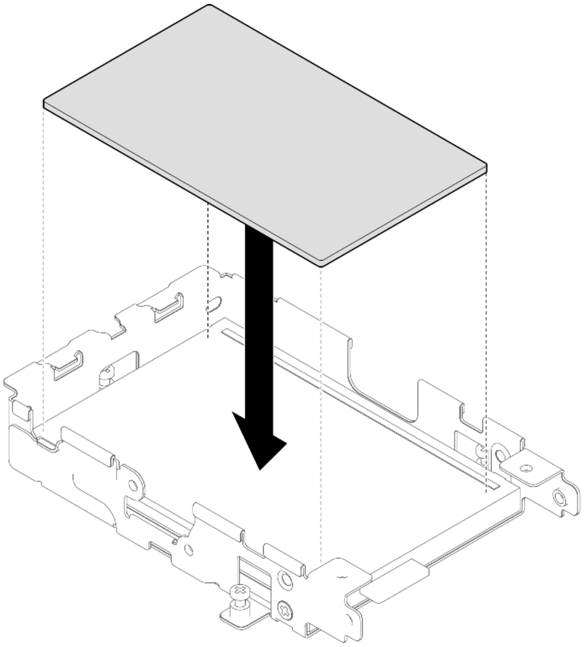


Figure 146. Placing the spacer on the bottom-side cooling drive

c. Install the second bottom-side cooling drive to the drive cage. **Make sure** the drive connector position is the same as shown in the illustration below. Afterwards, proceed to Step 3 on page 144.

Note: Pay attention to the drive connector position in the drive cage. The drive connector position of the two drives in the drive cage should be different.

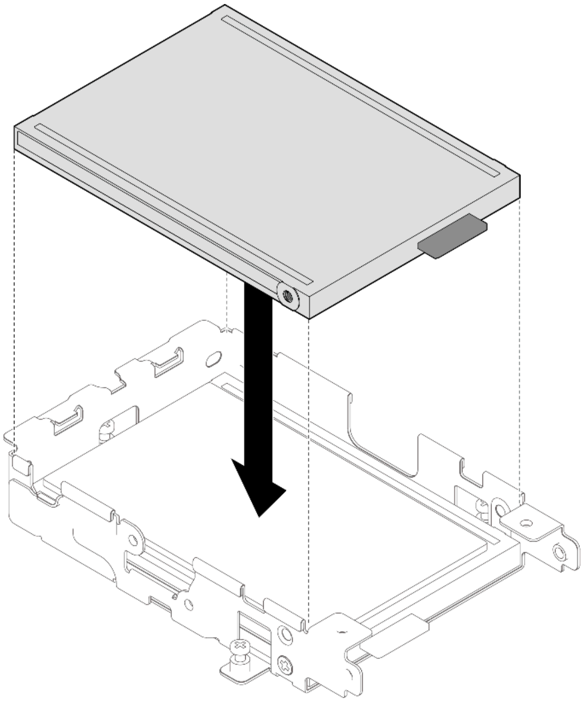


Figure 147. Installing second bottom-side cooling drive

Step 3. Install the eight PH1 screws to secure the drives to the drive cage.

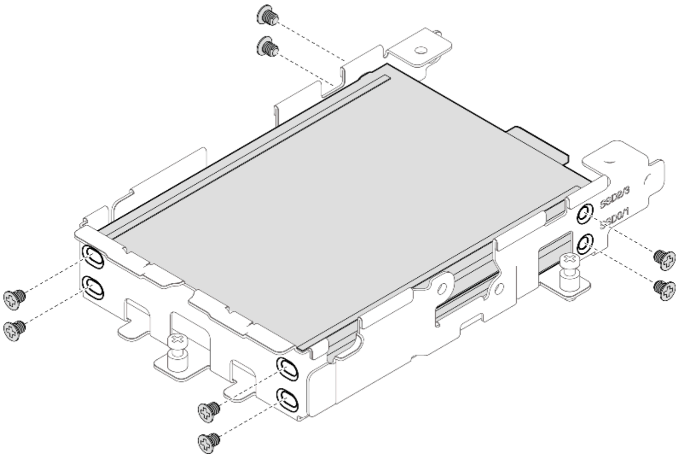


Figure 148. Installing screws to the drive cage

Step 4. Check the gap pad on heat sink, if it is damaged or detached, replace them with new one.

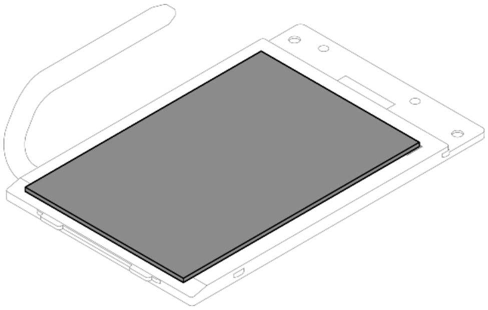


Figure 149. Heat sink gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 5. Install the heat sink to the drive cage.

a. ❶ Keep the heat sink at an angle, and align the tabs on the heat sink with the slots on drive cage.

b. ❷ Rotate the heat sink and place it on the drive cage.

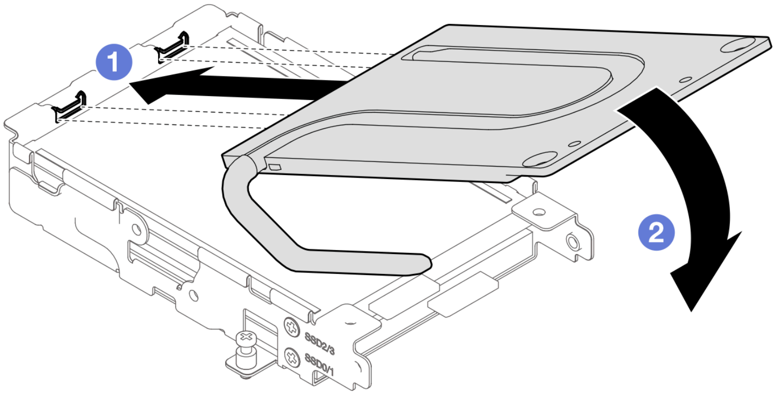


Figure 150. Installing the heat sink

Step 6. Install two PH1 screws to secure the heat sink to the drive cage.

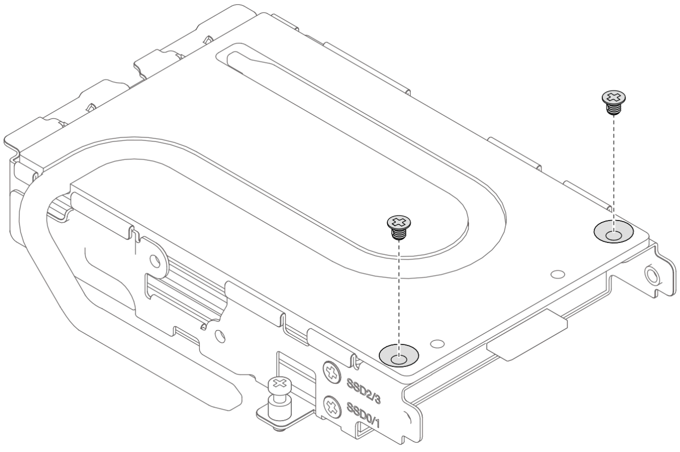


Figure 151. Installing heat sink screws

Step 7. Install two PH 1 screws to secure the side holder to the drive cage.

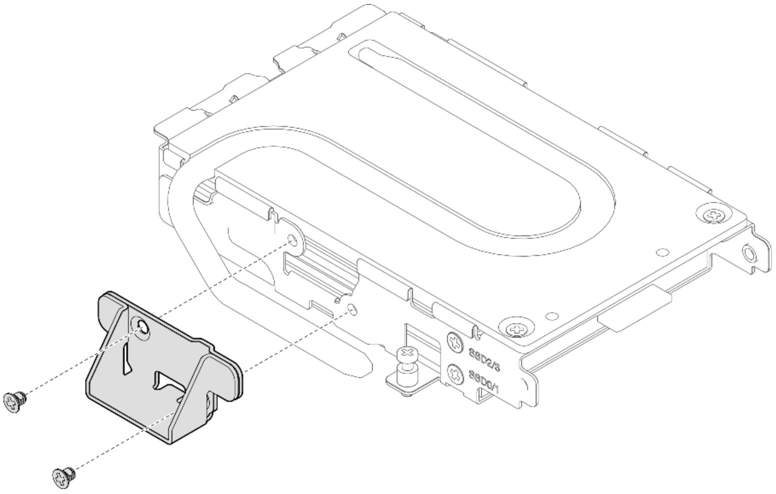


Figure 152. Installing the side holder

Step 8. Connect the cables to the drive.

Table 26. Cable plugger and drive number connection rule

From	**To**
Plugger marked as **0** or **1**	Drive in drive cage slot **SSD 0/1**
Plugger marked as **2** or **3**	Drive in drive cage slot **SSD 2/3**

Note: Depending on drive configuration, twisting cables may be needed to accommodate the cable pluggers to the drive cage.

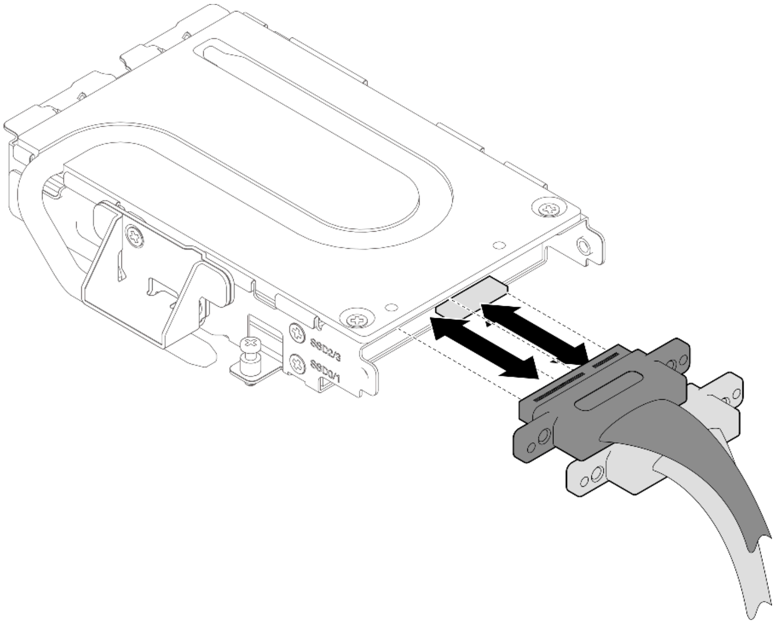


Figure 153. Connecting cables to drives

Step 9. Install the cable retainer to the drive cage.

a. Attach the cable retainer to the drive cage. Cable retainer orientation is different for top-side cooling drive and bottom-side cooling drive. Make sure to follow the cable retainer orientation guidance specified in the illustrations below.

   Attention:

   - For **top-side cooling** drive, orient the cable retainer as **1** shown in the illustration below.
   - For **bottom-side cooling** drive, orient the cable retainer as **2** shown in the illustration below.

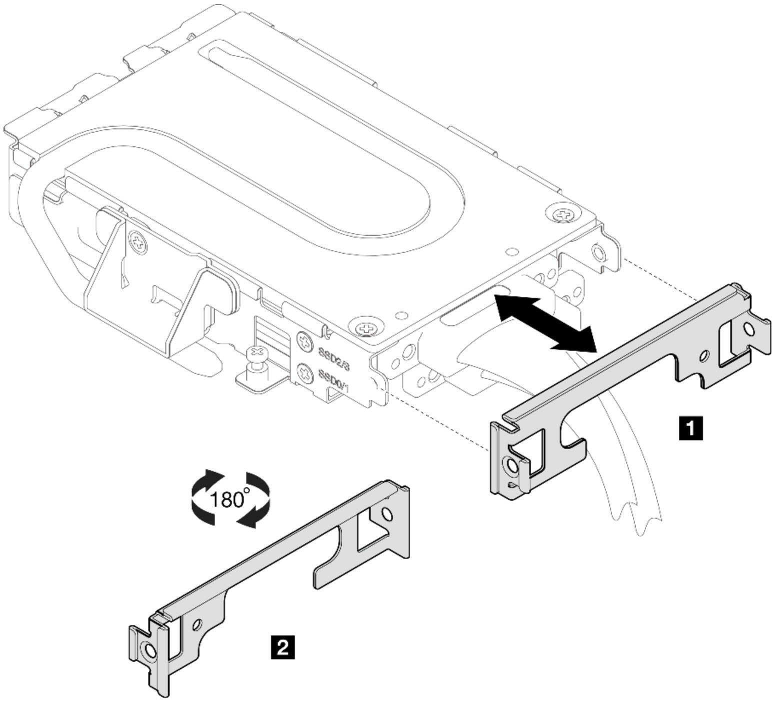


Figure 154. Installing cable retainer to the drive cage

b. Fasten two PH 1 screws to secure the cable retainer to the drive cage.

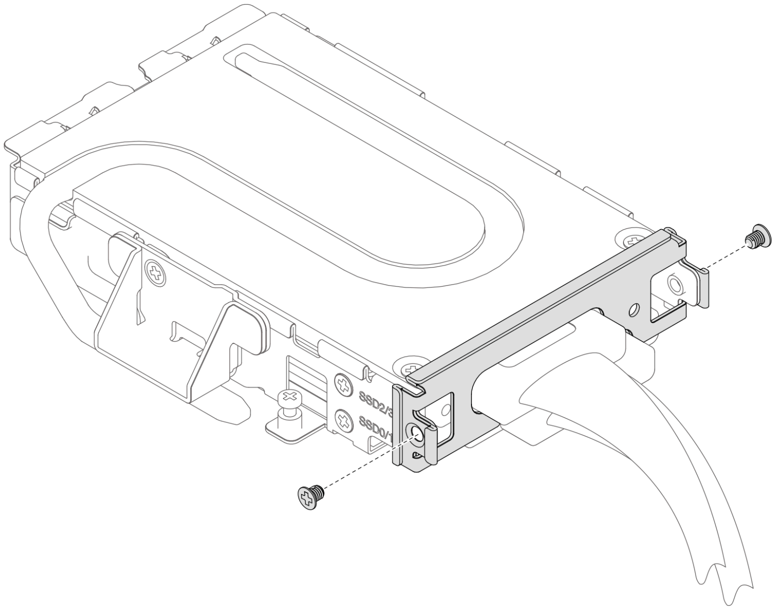


Figure 155. Installing cable retainer to the drive cage

After you finish

1. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

E3.S 2T single front drive replacement

Use the following procedures to remove and install an E3.S 2T single front drive.

Remove an E3.S 2T single front drive

Use this information to remove an E3.S 2T single front drive.

About this task

Required tools
- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)
- Storage Conduction Plate (if installing the E3.S 2T single front drive for the first time)

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

  a. Remove the tray from the enclosure. See “Remove a tray from the enclosure” on page 332.

  b. Remove the tray cover. See “Remove the tray cover” on page 372.

  c. Remove the cross braces. See “Remove the cross braces” on page 108.

  d. Remove the front E3.S drive cage. see “Remove an E3.S front drive cage assembly” on page 121.

Step 2. Remove the cable retainer from the drive cage.

  a. Remove two PH1 screws from the sides of the drive cage.

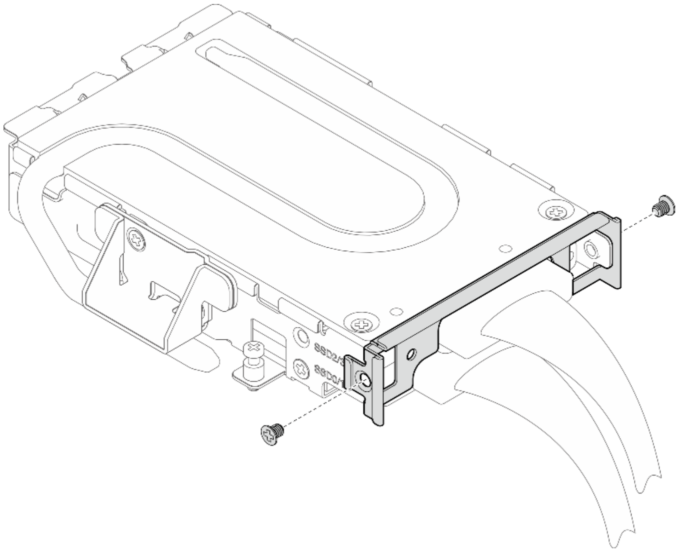


Figure 156. Remove screw from the cable retainer

  b. Remove the cable retainer.

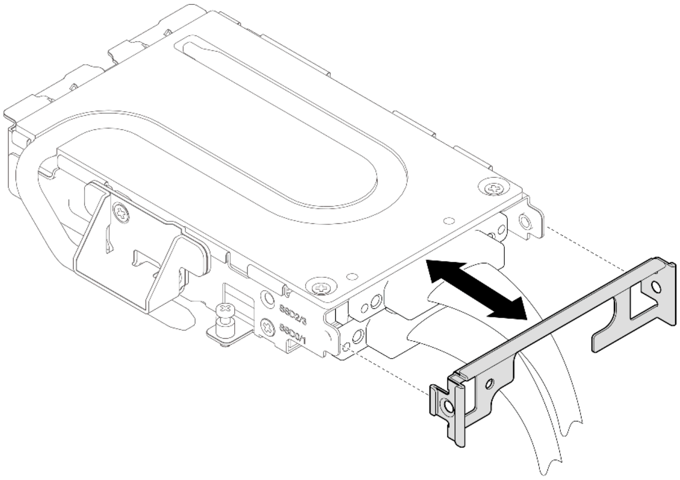


Figure 157. Remove the cable retainer

Step 3. Disconnect the cable from the drive.

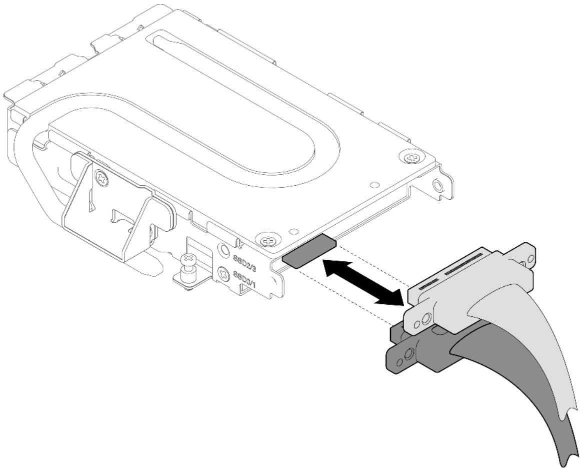


Figure 158. Disconnect the cable from the drives

Step 4. Remove two PH1 screws to remove the side holder from the drive cage.

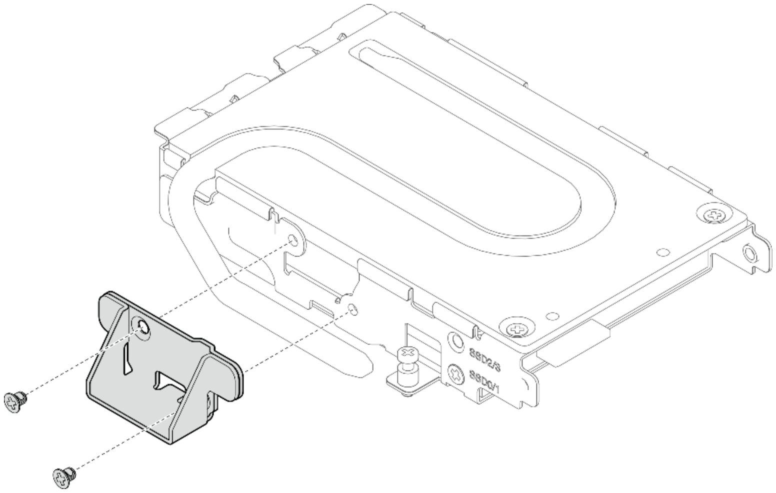


Figure 159. Removing the side holder

Step 5. Remove the two PH1 screws from the heat sink.

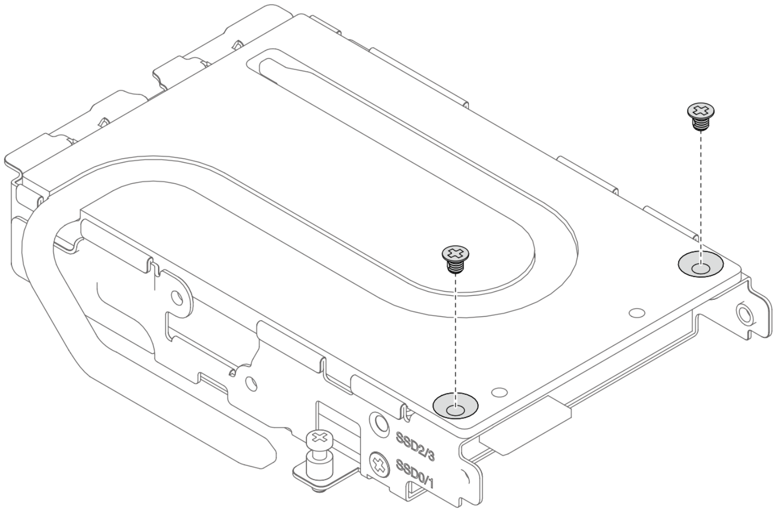


Figure 160. Removing screws from heat sink

Step 6. Remove the heat sink.

a. ① Rotate the heat sink until it is positioned at an angle.

b. ② Remove the heat sink from the drive cage.

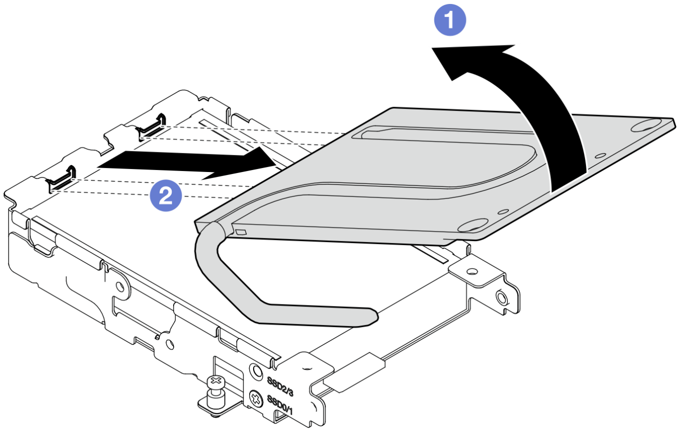


Figure 161. Removing the heat sink

Step 7. Remove the drive from the drive cage.

a. ① Remove four PH1 screws from the drive cage.

b. ② Remove the drive from the drive cage.

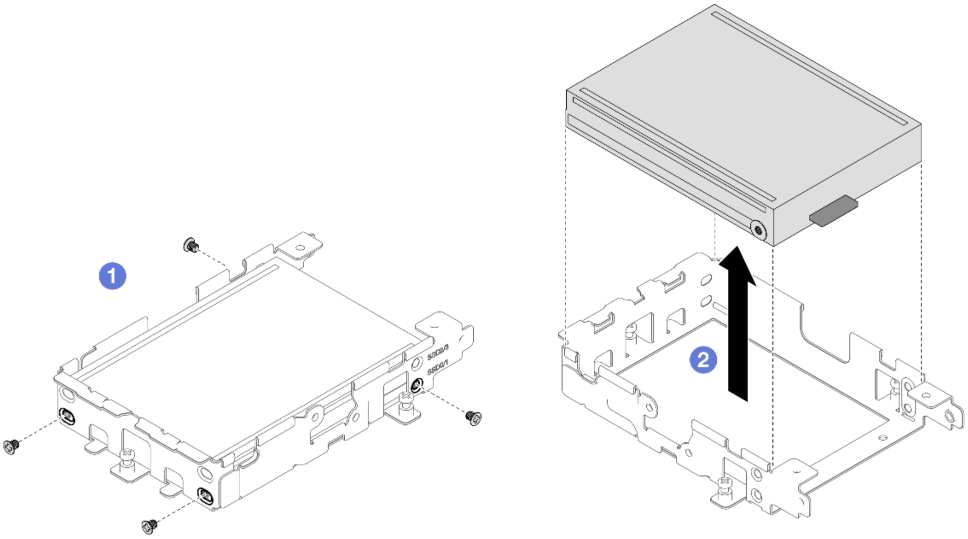


Figure 162. Removing the drive from the drive cage

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an E3.S 2T single front drive

Use this information to install an E3.S 1T single front drive.

About this task

Required tools

- Screwdriver for PH 1 screws
- Storage Gap Pad Kit (SC750 V4)

- Storage Conduction Plate (if installing the E3.S 2T single front drive for the first time)

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install an E3.S 2T drive to the drive cage.

a. ① Keep the drive connector orientation as shown in the illustration below. Then, install the drive into the cage.

b. ② Install four PH1 screws to secure the drive to the drive cage

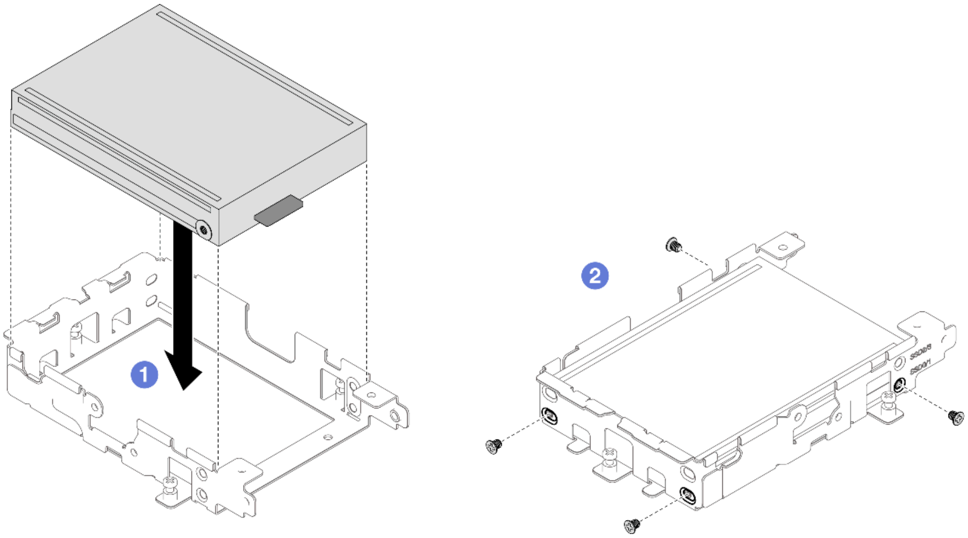


Figure 163. Installing E3.S 2T drive

Step 2. Check the gap pad on heat sink, if it is damaged or detached, replace them with new one.

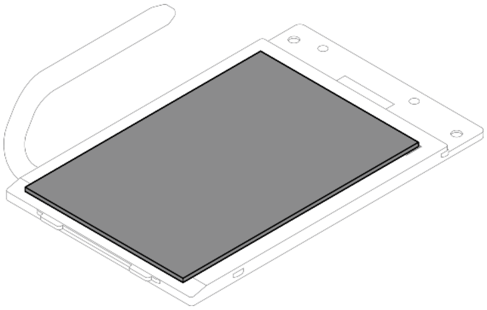


Figure 164. Heat sink gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 3. Install the heat sink to the drive cage.

a. ① Keep the heat sink at an angle, and align the tabs on the heat sink with the slots on drive cage.

b. ② Rotate the heat sink and place it on the drive cage.

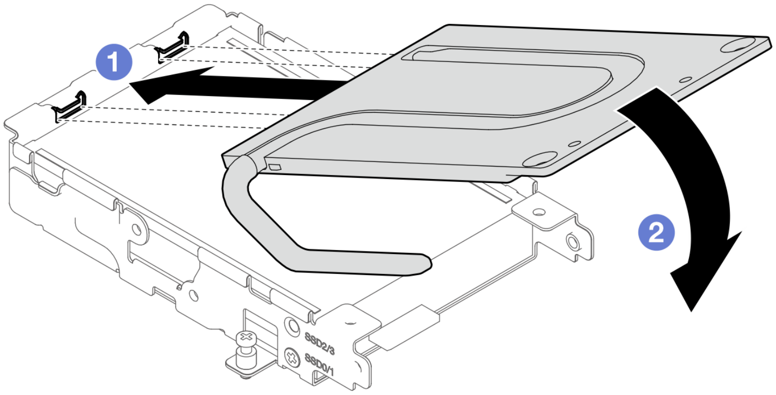


Figure 165. Installing the heat sink

Step 4. Install two PH1 screws to secure the heat sink to the drive cage.

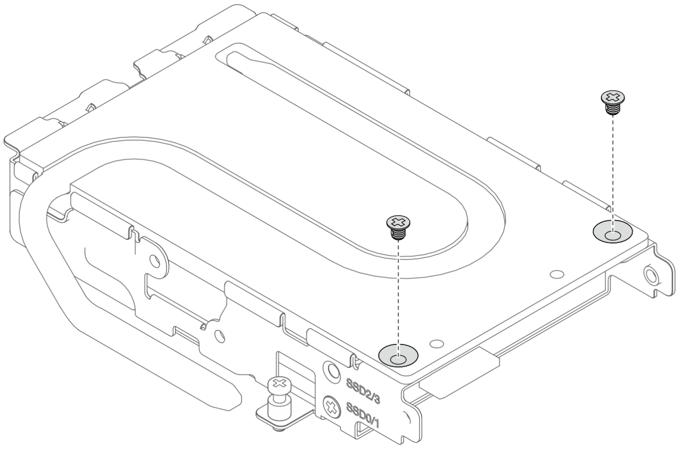


Figure 166. Installing heat sink screws

Step 5. Install two PH1 screws to secure the side holder to the drive cage.

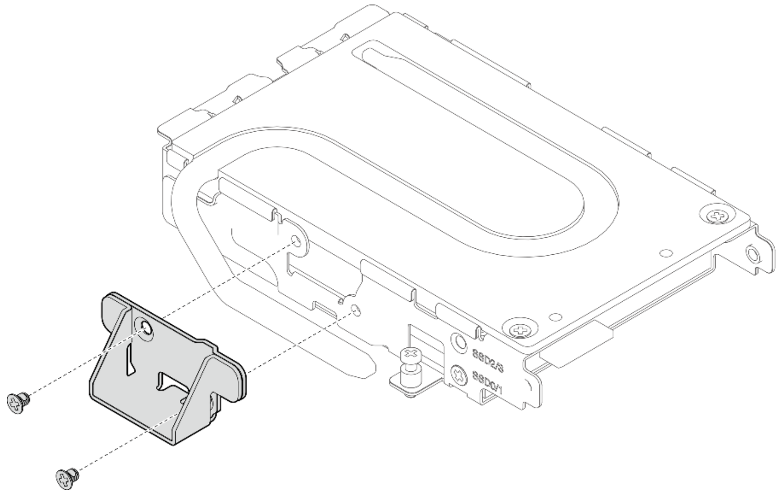


Figure 167. Installing the side holder

Step 6. Connect the cable with plugger marked as **0** or **1** to the drive. Place the other cable plugger under the connected one.

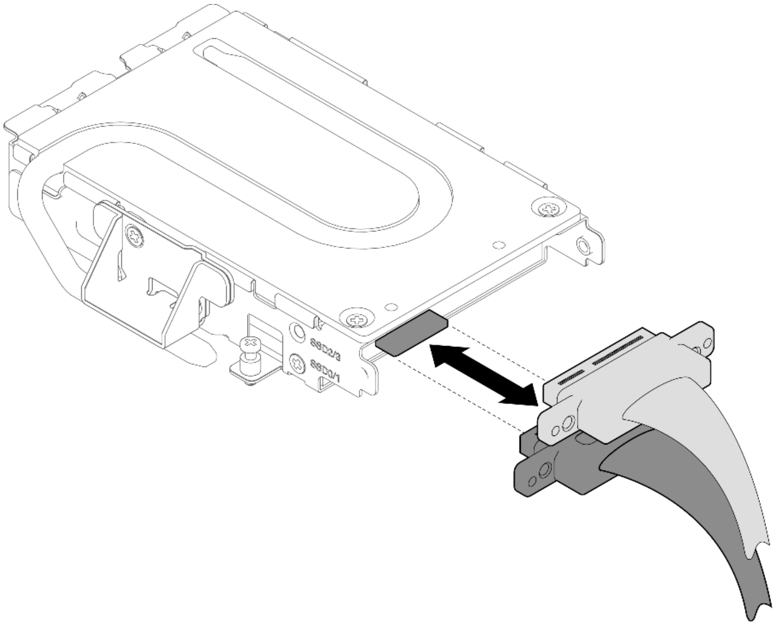


Figure 168. Connecting cable to drive

Step 7. Install the cable retainer to the drive cage.

a. Attach the cable retainer to the drive cage.

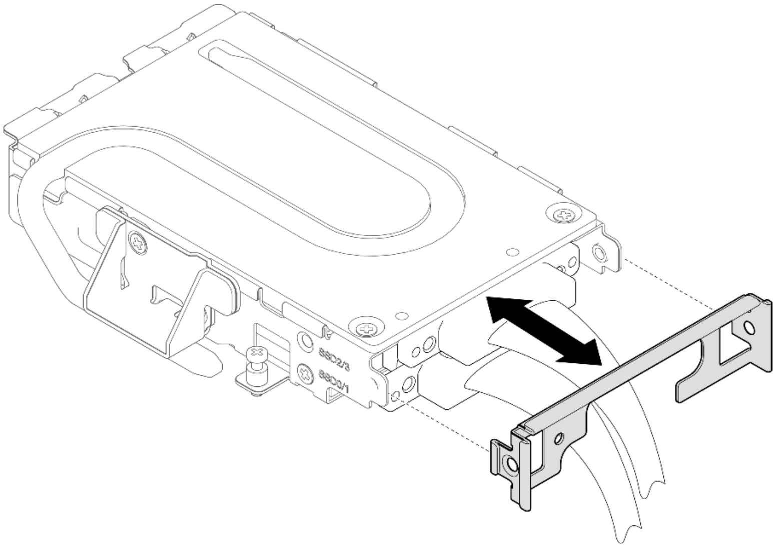


Figure 169. Installing cable retainer to the drive cage

b. Fasten two PH1 screws from the sides to secure the cable retainer to the drive cage.

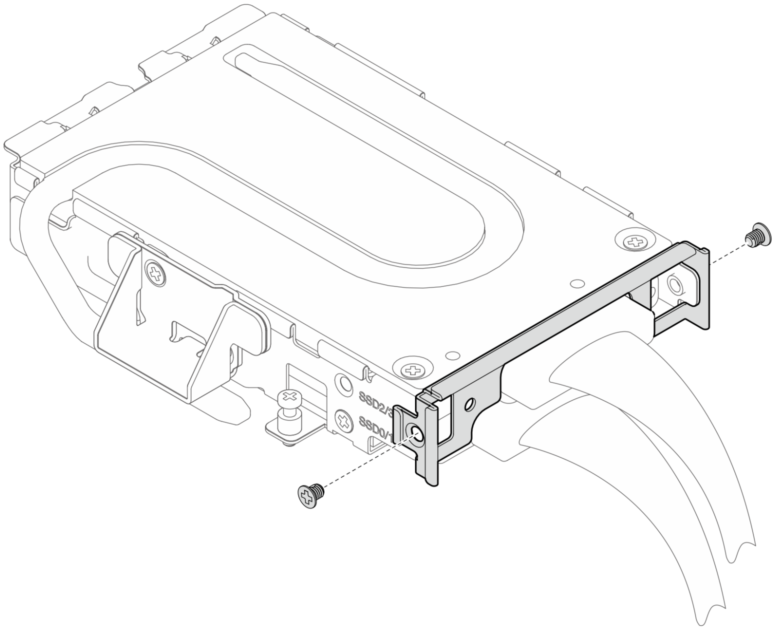


Figure 170. Installing cable retainer to the drive cage

After you finish

1. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

E3.S middle drive cage assembly replacement

Use the following procedures to remove and install an E3.S middle drive cage assembly.

Remove an E3.S middle drive cage assembly

Use this information to remove an E3.S middle drive cage assembly.

About this task

Required tools

- Screwdriver for PH 1 screws
- MID E3.S TOP Gap Pad (SC750 V4)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

  a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

  b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove sixteen (16x) screws to remove the rear cross brace.

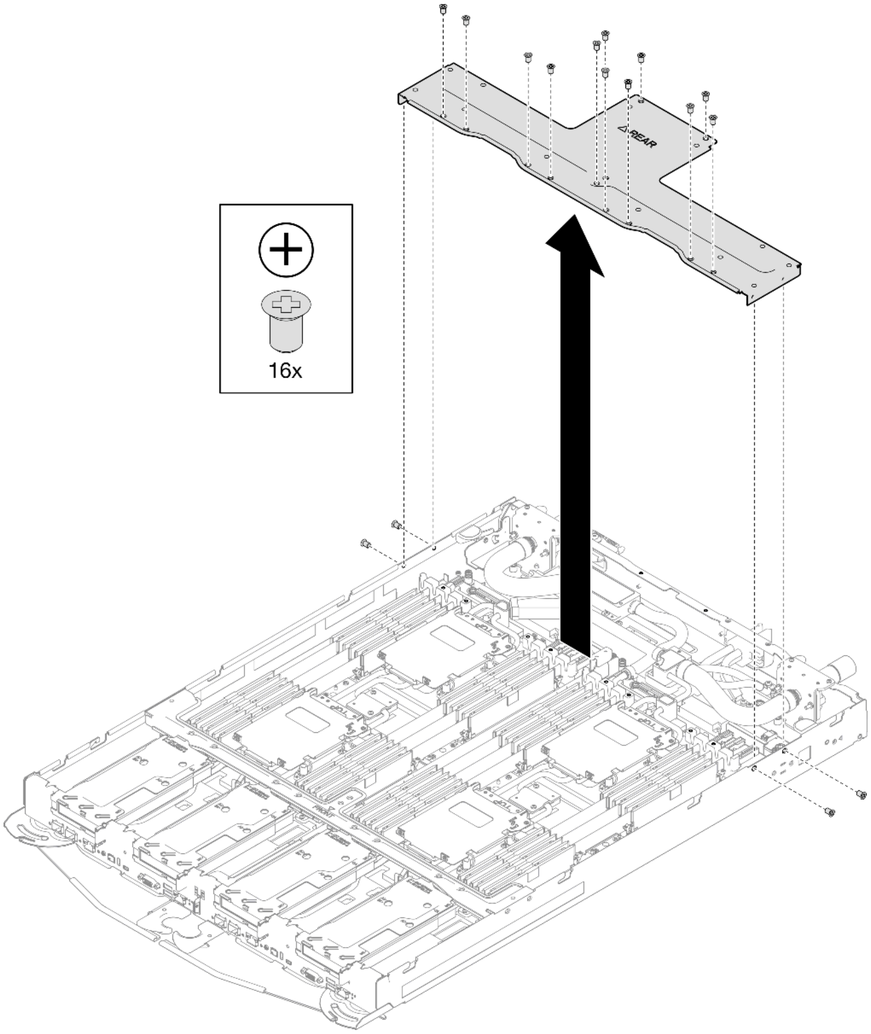


Figure 171. Removing rear cross brace

Step 3. Disconnect the cables from the system board. See ***Internal Cable Routing Guide***.

Step 4. Remove the two PH1 screws on the front of the drive cage.

The screw locations are different for bottom-side cooling drive and top-side cooling drive, see the illustrations below for details.

1 Screw locations for bottom-side cooling drive
2 Screw locations for top-side cooling drive

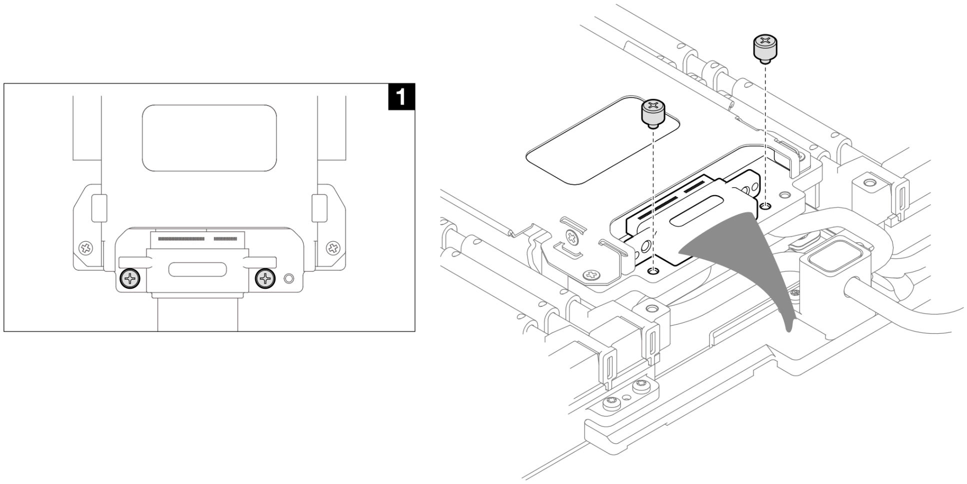


Figure 172. Removing screws for bottom-side cooling drive

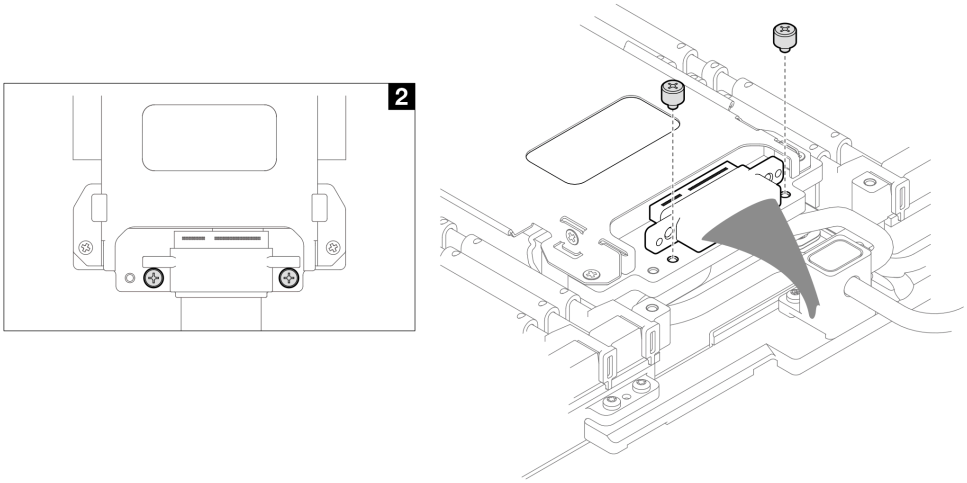


Figure 173. Removing screws for top-side cooling drive

Step 5. Disconnect cable from the drive.

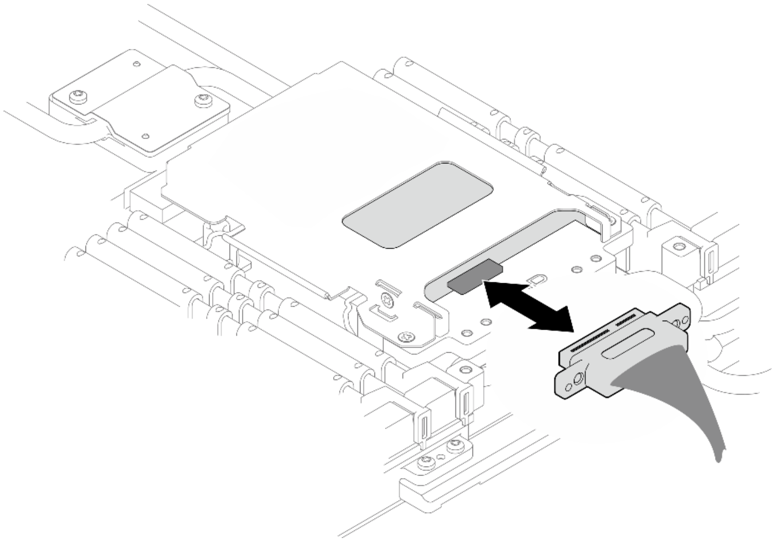


Figure 174. Disconnecting cable from the drive

Step 6. Remove the two PH1 screws on top of the drive cage.

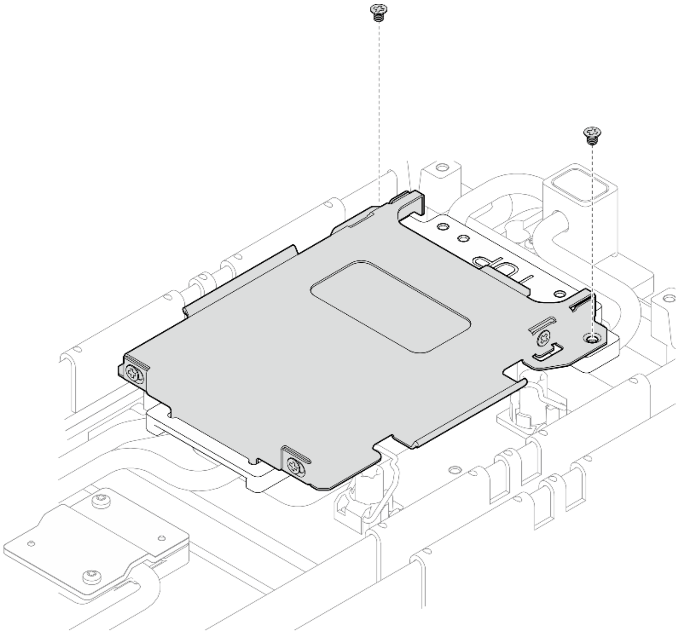


Figure 175. Removing screws on top of the drive cage

Step 7. Remove the drive cage.

a. ① Rotate the drive cage until it is positioned at an angle.

b. ② Disengage the drive cage from cold plate, and remove it from the water loop.

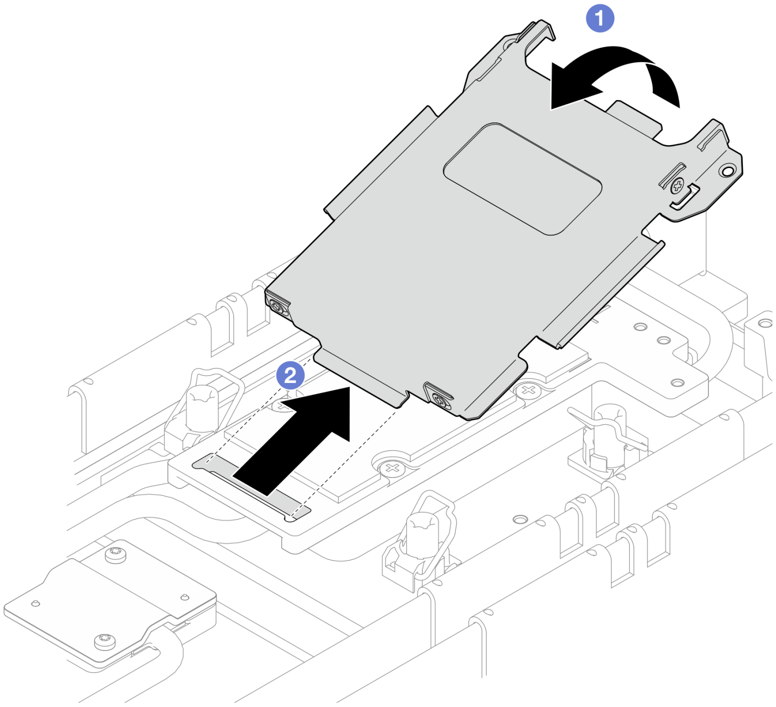


Figure 176. Removing the E3.S middle drive cage

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an E3.S 1T middle drive cage assembly

Use this information to install an E3.S 1T middle drive cage assembly.

About this task

Required tools

- Screwdriver for PH 1 screws
- MID E3.S TOP Gap Pad (SC750 V4)

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Check the gap pad on the top side of the E3.S middle cold plate, if it is damaged or detached, replace them with new one.

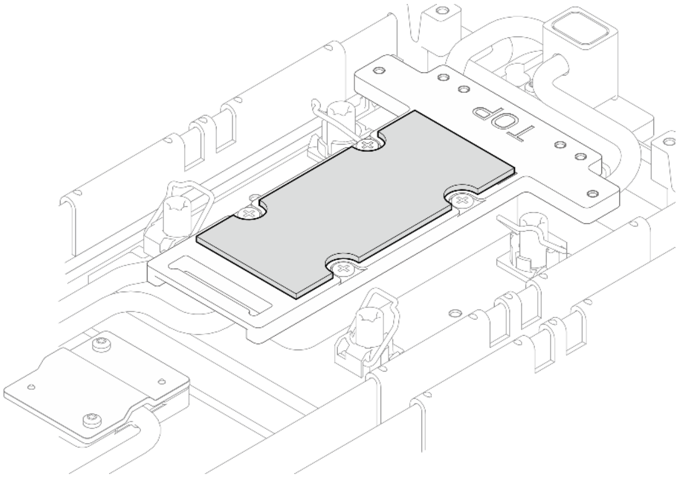


Figure 177. E3.S middle cold plate top side gap pad location

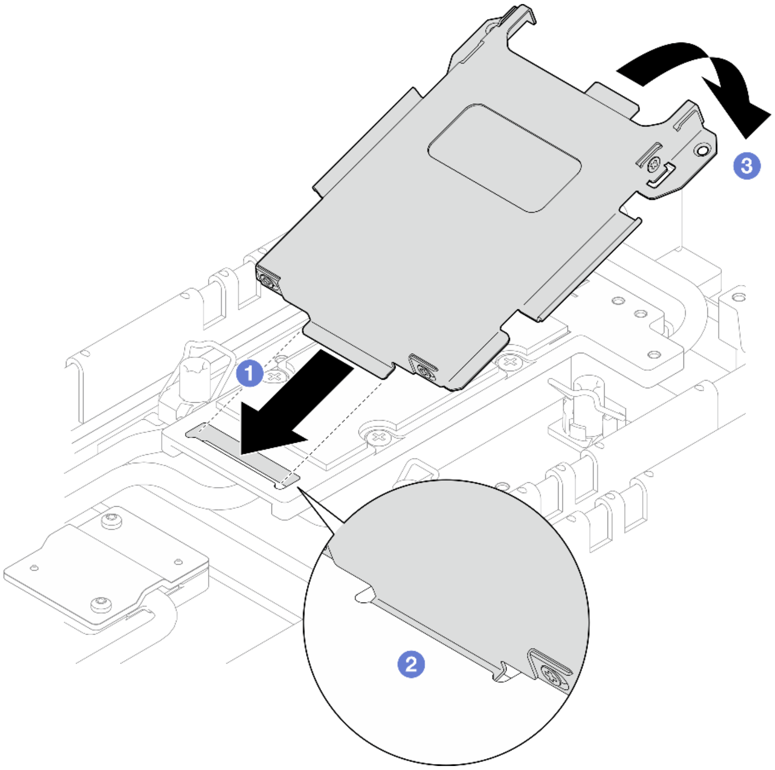
Make sure to follow Gap pad replacement guidelines.

Step 2. Install the E3.S middle drive cage to the cold plate on the water loop.

a. ① Keep the drive cage at an angle, and align the tab on the drive cage with the slot on the E3.S middle drive cold plate.

b. ② Insert the tab into the slot until they are hooked together.

c. ③ Rotate the drive cage and place it on top of the cold plate.



Step 3. Install two PH1 screws on top of the drive cage.

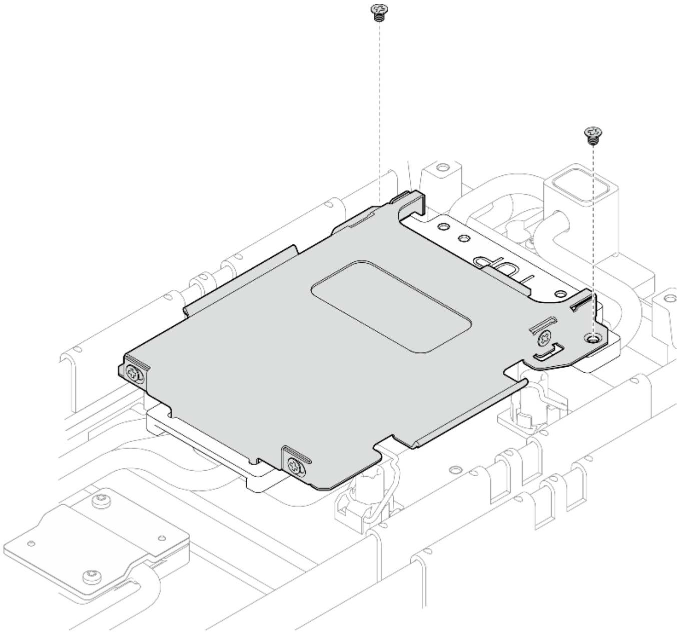


Figure 178. Installing screws on top of the drive cage

Step 4. Connect cable to the drive.

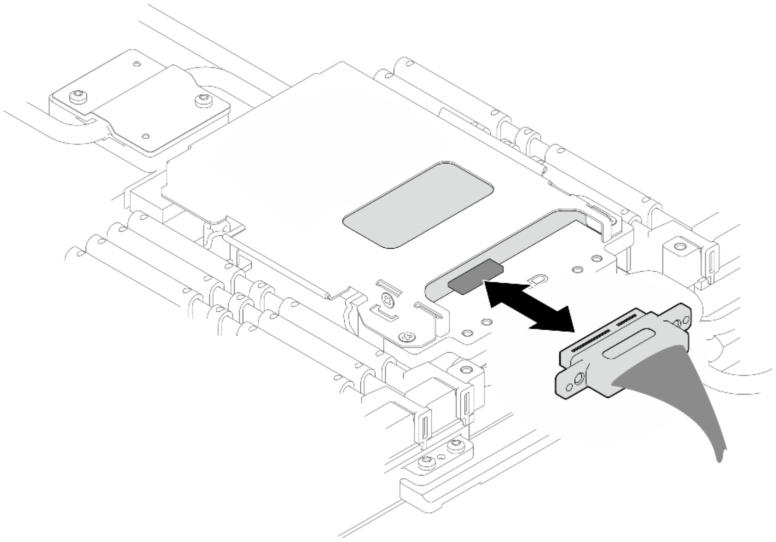


Figure 179. Connecting cable to the drive

Step 5. Installing two PH1 screws on the front of the drive cage.

The screw locations are different for bottom-side cooling drive and top-side cooling drive, see the illustrations below for details.

1 Screw locations for bottom-side cooling drive
2 Screw locations for top-side cooling drive

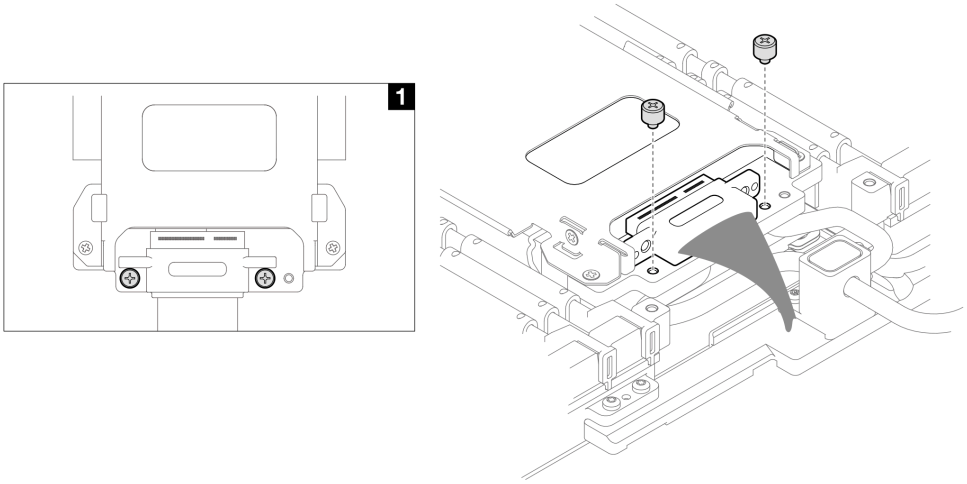


Figure 180. Installing screws for bottom-side cooling drive

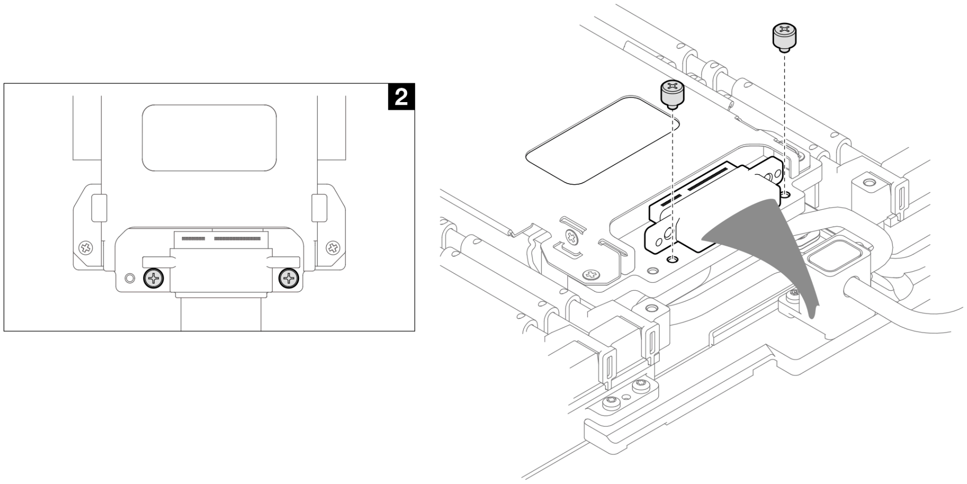


Figure 181. Installing screws for top-side cooling drive

Step 6. Place the rear cross brace on the tray.

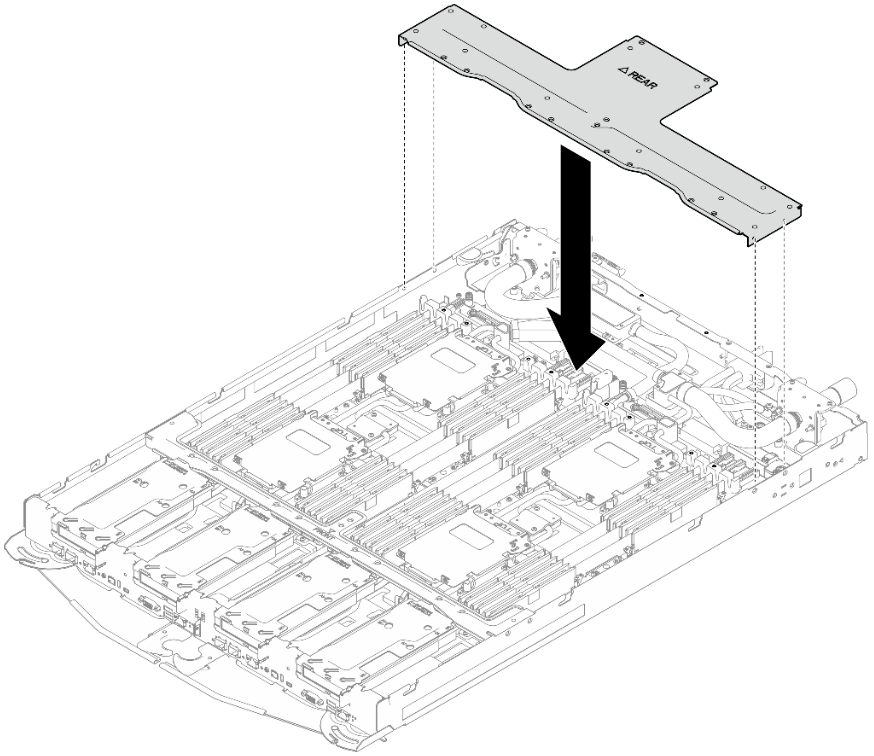


Figure 182. Placing rear cross brace on the tray

Step 7. Install the rear cross braces to the tray.

   a. Install ten (10x) PH1 screws to secure the rear cross brace.

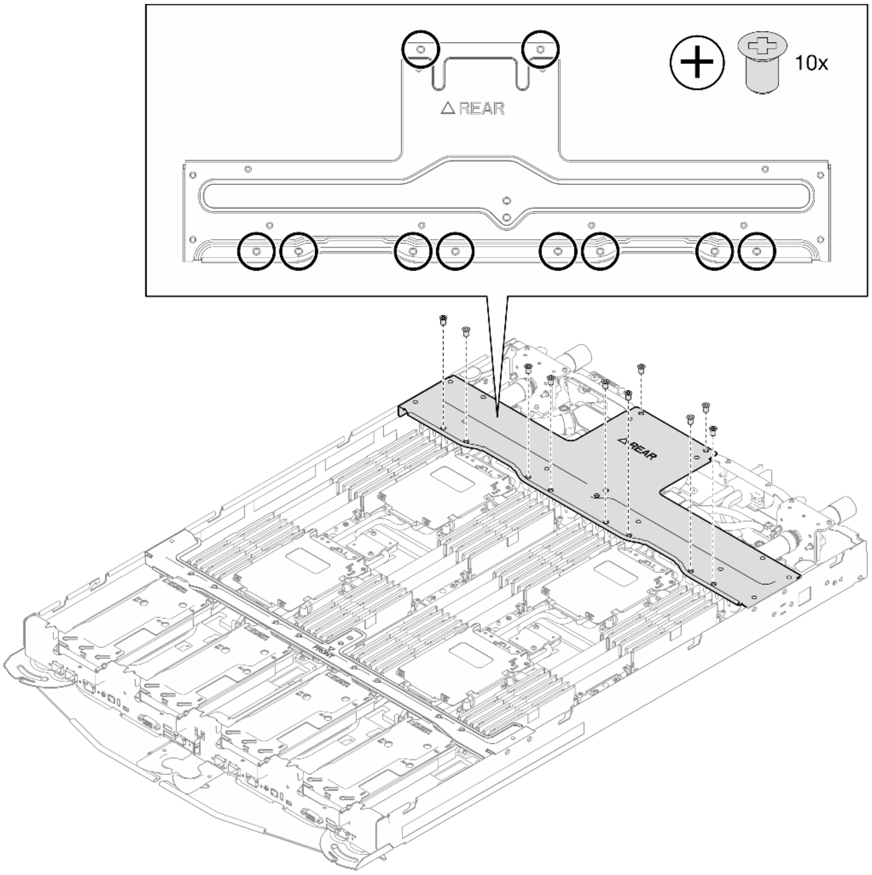


Figure 183. Installing screws to the rear cross brace (10x)

b. Fasten six (6x) PH1 screws to install the cross braces.

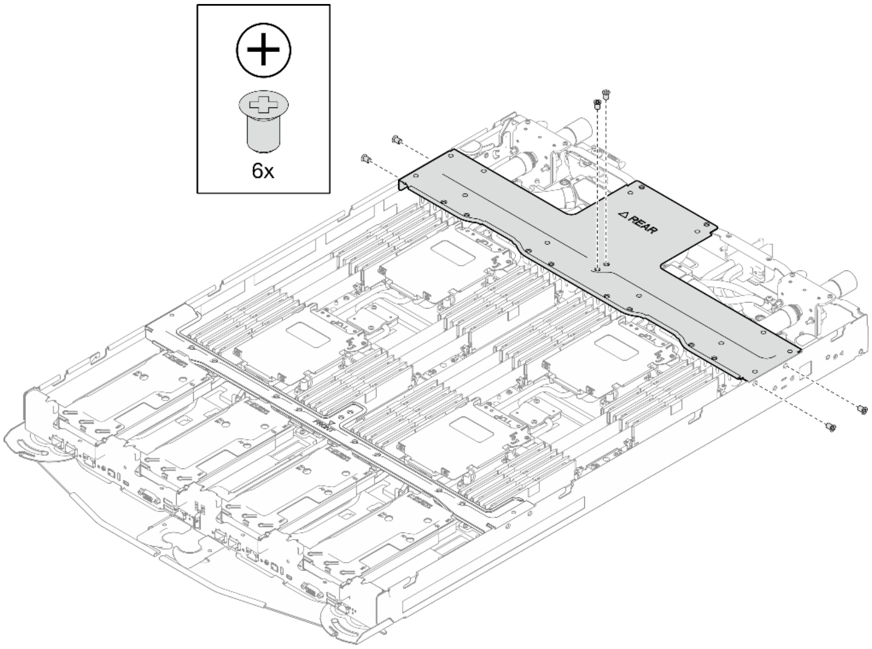


Figure 184. Installing screws to the rear cross brace (6x)

After you finish

1. Connect the cables to the system board. See ***Internal Cable Routing Guide***.
2. Install the tray cover. See "Install the tray cover" on page 373.
3. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
4. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
5. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

E3.S middle drive replacement

Use the following procedures to remove and install an E3.S middle drive.

Remove an E3.S 1T middle drive

Use this information to remove an E3.S 1T middle drive.

About this task

Required tools

- Screwdriver for PH 1 screws
- MID E3.S TOP Gap Pad (SC750 V4)

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.
- b. Remove the tray cover. See "Remove the tray cover" on page 372.
- c. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

Step 2. Remove the four PH 1 screws from the drive cage.

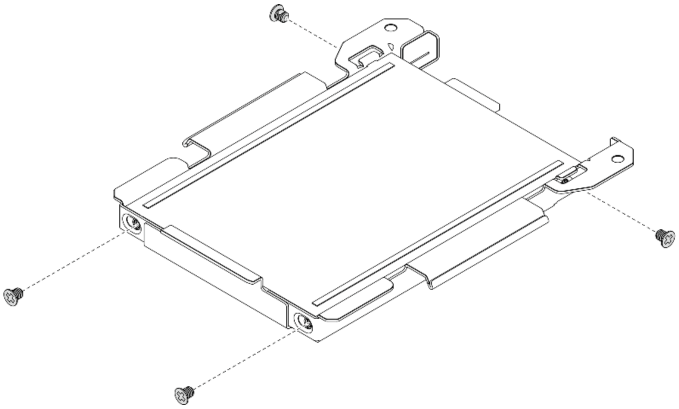


Figure 185. Removing screws from the drive cage

Step 3. Remove the drive from the drive cage. (**1** Top-side cooling drive, **2** Bottom-side cooling drive)

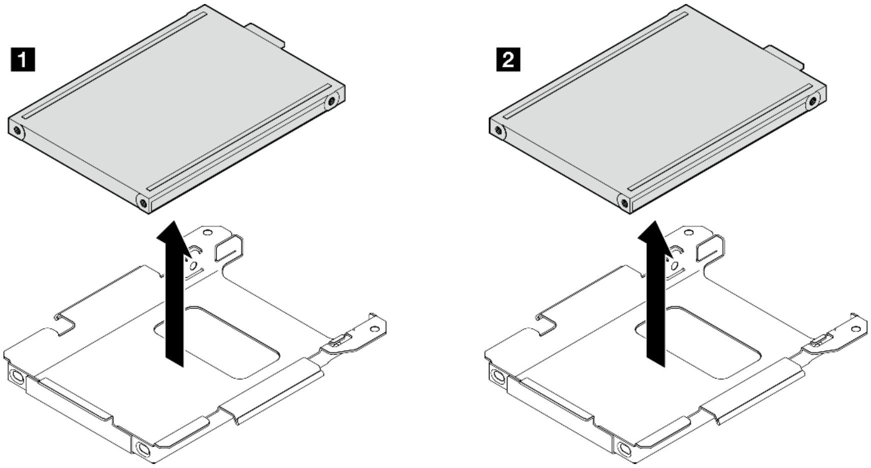


Figure 186. Removing the drive from the drive cage

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an E3.S 1T middle drive

Use this information to install an E3.S 1T middle drive.

About this task

Required tools

- Screwdriver for PH 1 screws
- MID E3.S TOP Gap Pad (SC750 V4)

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.

- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

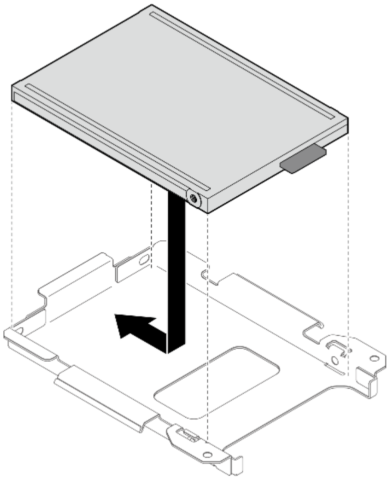
Procedure

Step 1. Install an E3.S 1T drive to the drive cage.

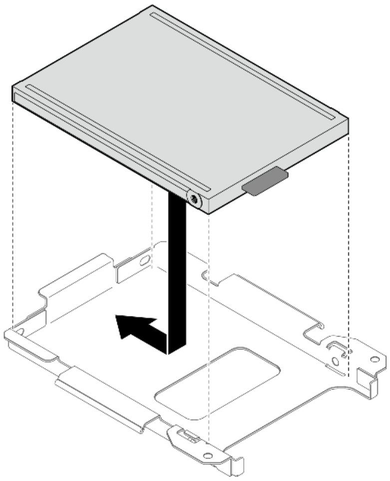
Attention: Drive connector orientation is different for top-side cooling drive and bottom-side cooling drive. Make sure to follow the drive connector orientation guidance specified in the illustrations below.

Drive connector orientation:
1 Bottom-side cooling drive
2 Top-side cooling drive

1

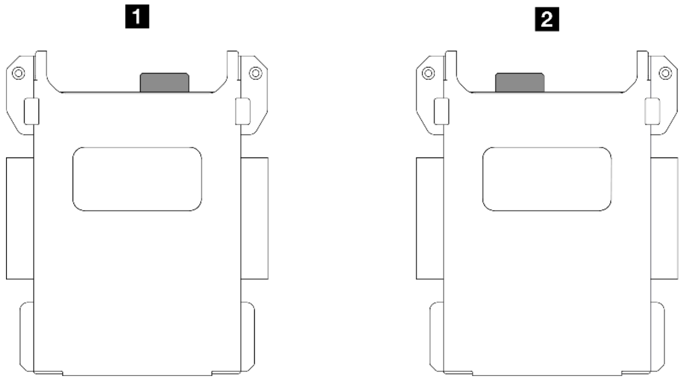


2



Step 2. Make sure the drive connector orientation is correct as specified in the illustrations below.

Drive connector orientation:
1 Bottom-side cooling drive
2 Top-side cooling drive



Step 3. Install the four PH 1 screws to secure the drive to the drive cage.

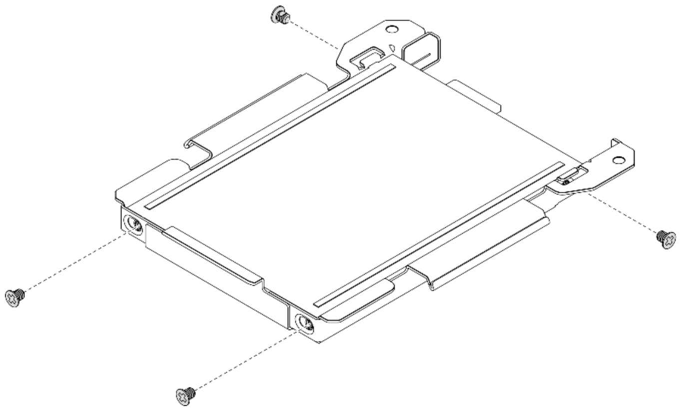


Figure 187. Installing screws to the drive cage

After you finish

1. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
2. Install the tray cover. See "Install the tray cover" on page 373.
3. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
4. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

5. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Ferrite core replacement

Use the following procedures to remove and install the ferrite core.

Remove the ferrite core

Use this information to remove the ferrite core. Depending on the configuration, there may be no ferrite core attached to the sideband cable in the system.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

- a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.
- b. Remove the tray cover. See "Remove the tray cover" on page 372.
- c. Remove the cross braces. See "Remove the cross braces" on page 108.

Step 2. Locate the ferrite core, which is attached to the sideband cable kit. Remove the ferrite core from the sideband cable.

- a. ① Open the ferrite core.
- b. ② Remove the ferrite core from the sideband cable.

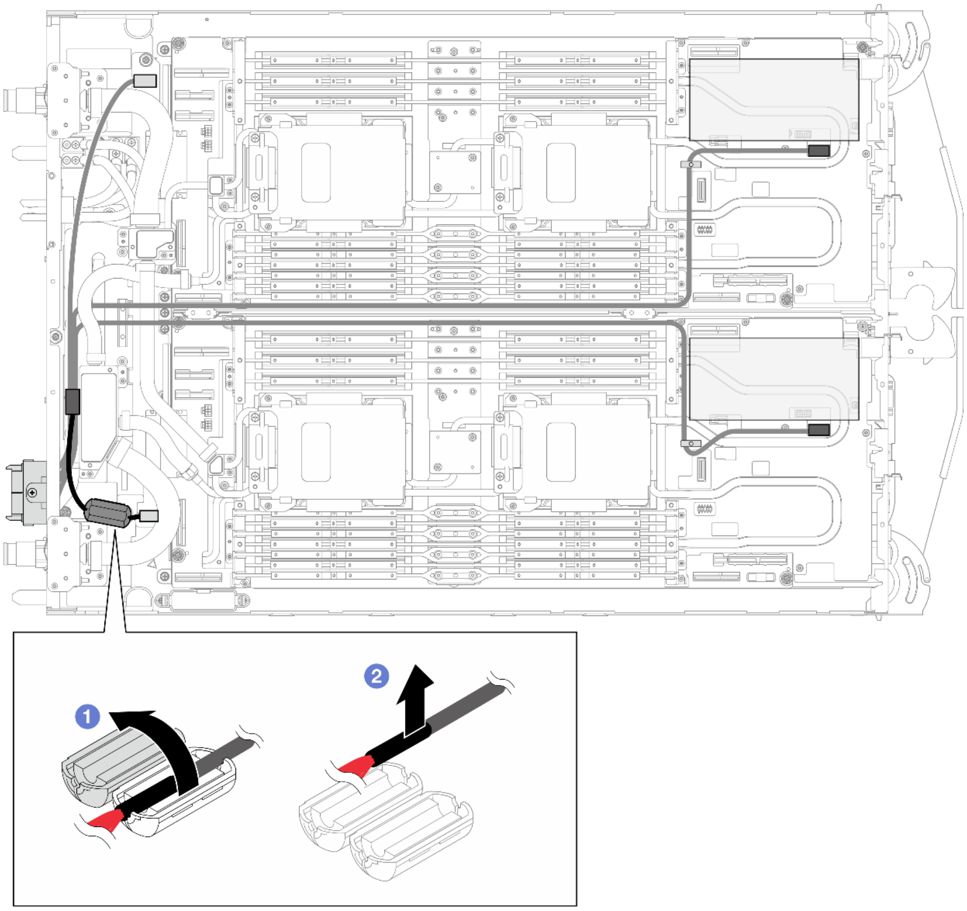


Figure 188. Removing the ferrite core from the sideband cable

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the ferrite core

Use this information to install the ferrite core. Depending on the configuration, there may be no ferrite core attached to the sideband cable in the system.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Attach the ferrite core to the sideband cable.

a. ❶ Open the ferrite core.

b. ❷ Place the sideband cable into the groove inside the ferrite core. Make sure the tape-covered section of the cable is encased in the ferrite core.

c. ❸ Close the ferrite core and lock the clips in place.

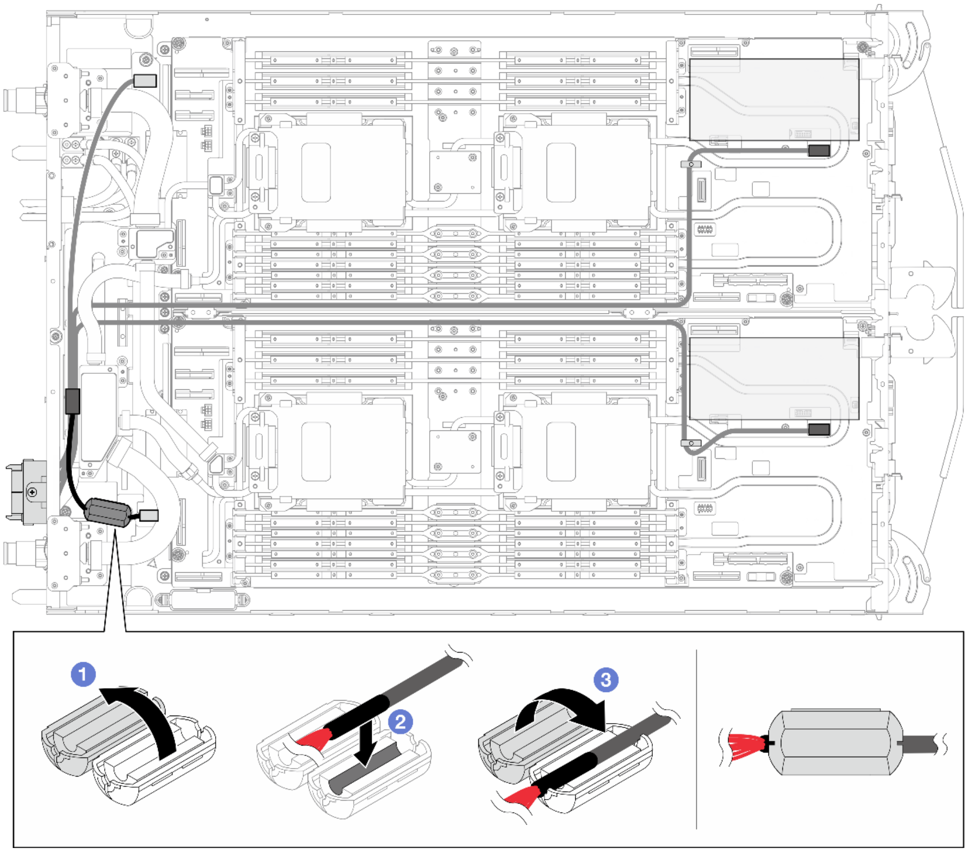


Figure 189. Attaching the ferrite core to the sideband cable

After you finish

1. Install the cross braces. See "Install the cross braces" on page 109.
2. Install the tray cover. See "Install the tray cover" on page 373.
3. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
4. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

5. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Foolproof module replacement

Use the following procedures to remove and install the foolproof module in the tray.

Remove the foolproof module

Use this information to remove the foolproof module.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

  a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

  b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove the rear cross brace.

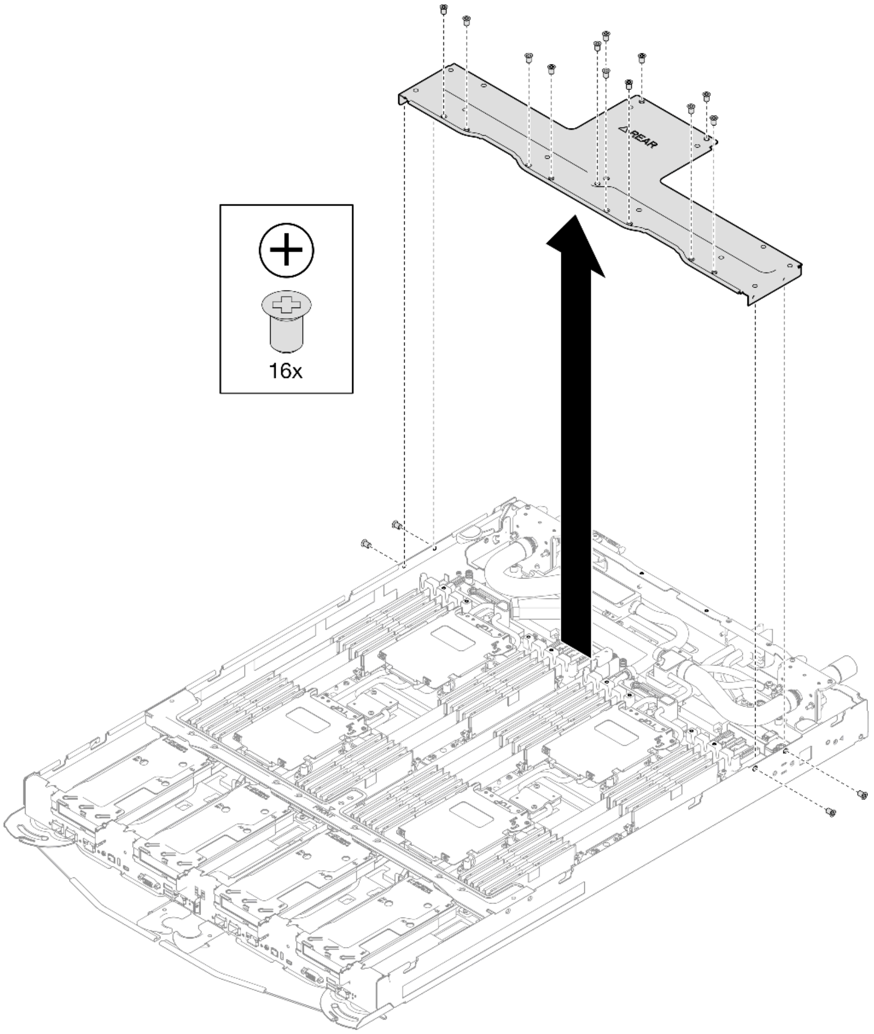


Figure 190. Removing the rear cross brace

Step 3. Place the front drive cable on top of the water loop.

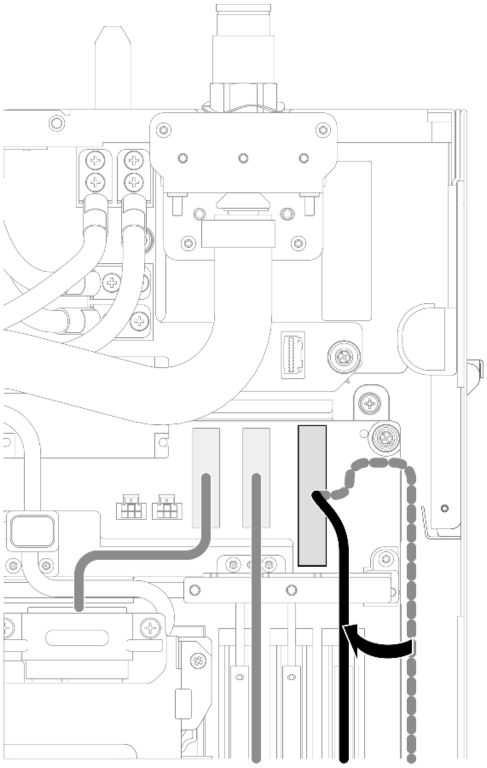


Figure 191. Placing the cable on top of the water loop.

Step 4. Remove the foolproof module from the tray.

a. ① From outside of the tray, remove two screws from the tray.

b. ② Remove the foolproof module from the tray.

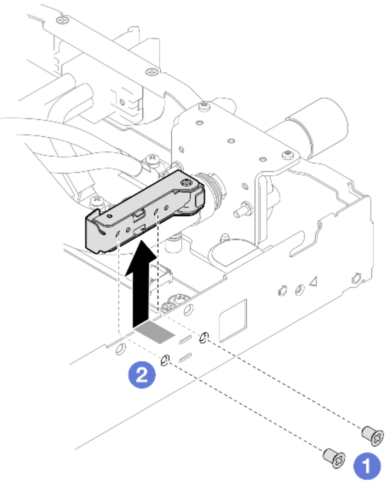


Figure 192. Removing the foolproof module

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the foolproof module

Use this information to install the foolproof module.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install the foolproof module to the tray.

a. ① Install the foolproof module to the tray.

b. ② From outside of the tray, install two screws to secure the foolproof module to the tray.

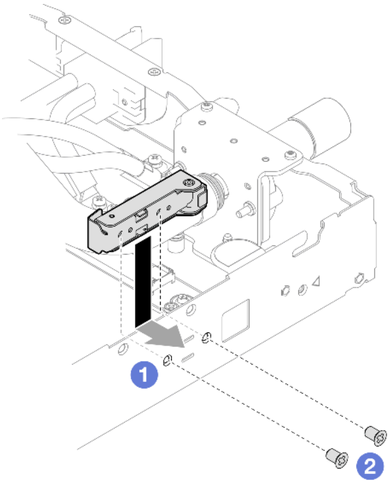


Figure 193. Installing the foolproof module

Step 2. Place the front drive cable beside the water loop.

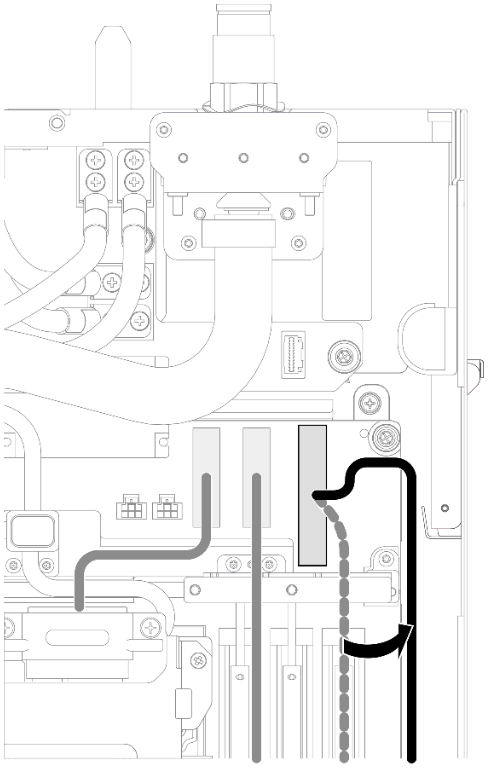


Figure 194. Placing the front drive cable beside the water loop

Step 3. Place the rear cross brace on the tray.

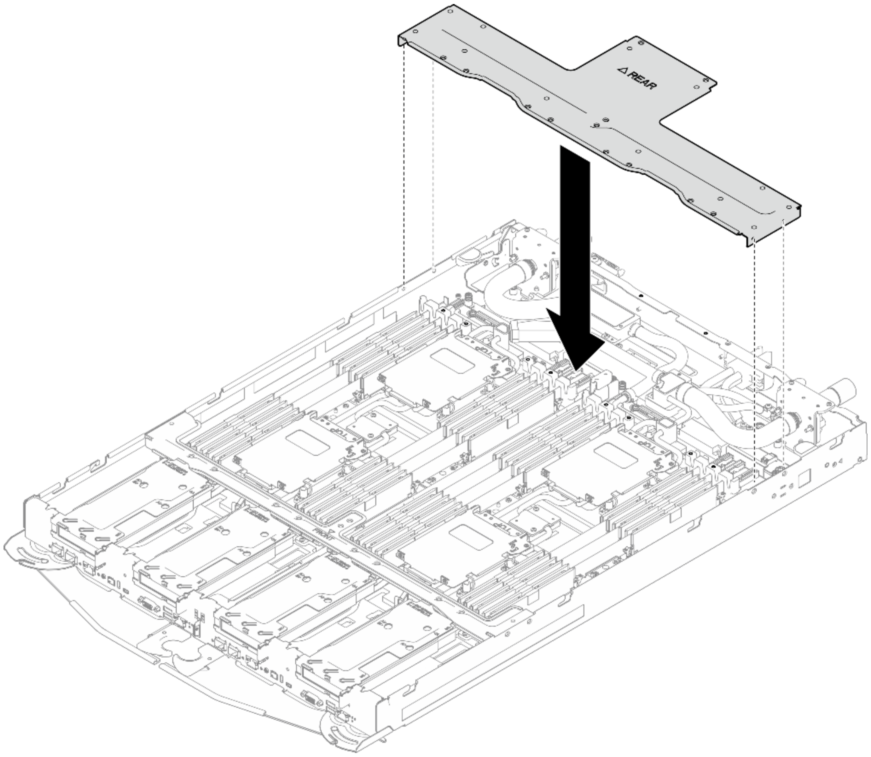


Figure 195. Placing rear cross brace on the tray

Step 4. Install the rear cross braces to the tray.

a. Install ten (10x) PH1 screws to secure the rear cross brace.

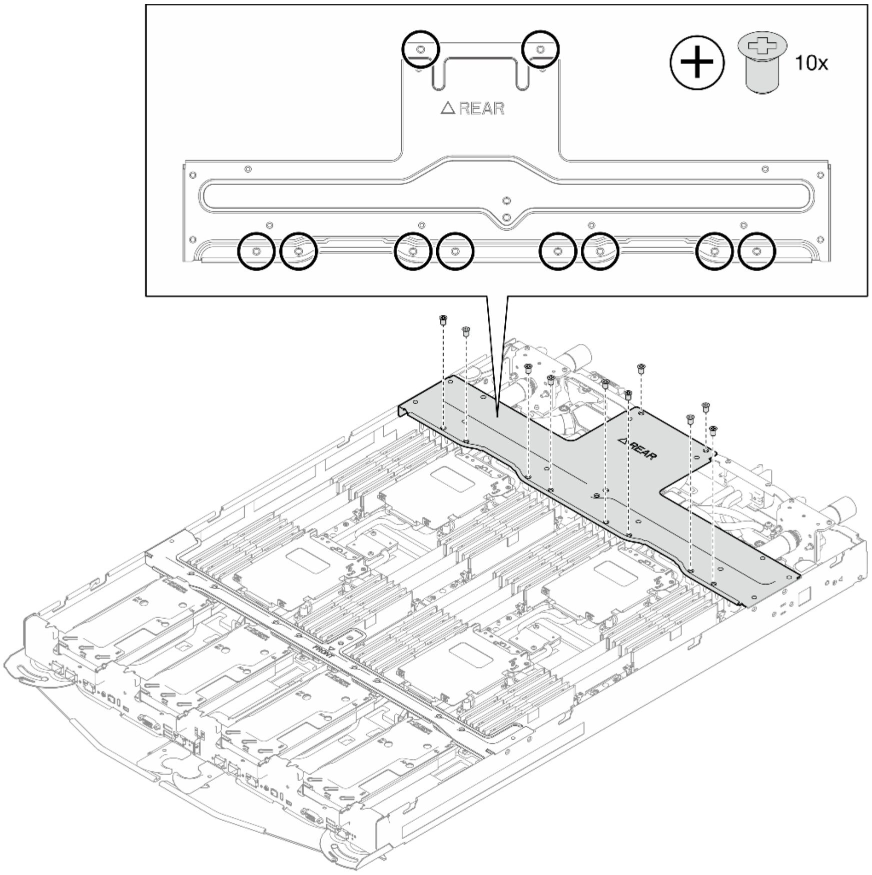


Figure 196. Installing screws to the rear cross brace (10x)

b. Fasten six (6x) PH1 screws to install the cross braces.

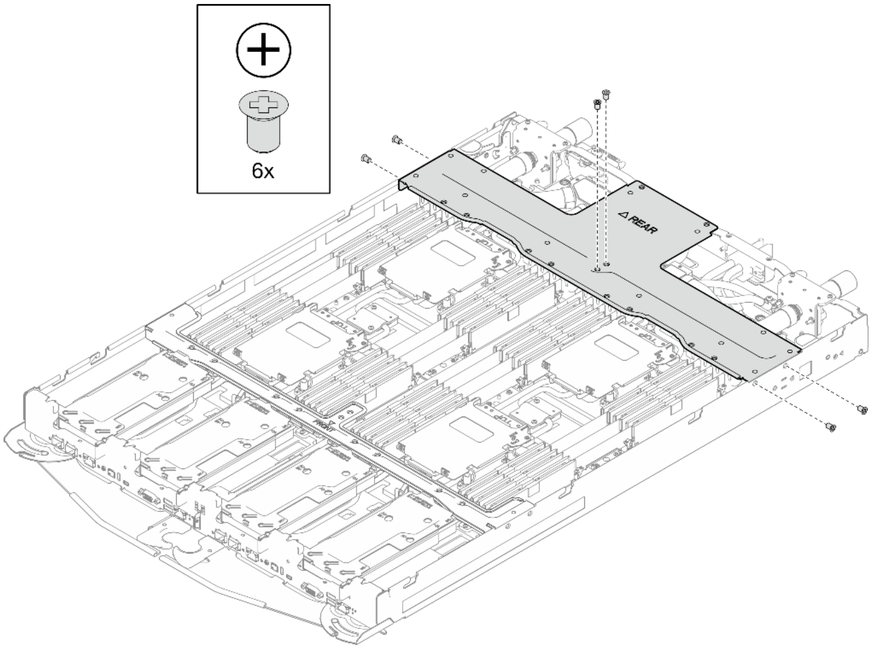


Figure 197. Installing screws to the rear cross brace (6x)

After you finish

1. Install the tray cover. See "Install the tray cover" on page 373.
2. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Front I/O board replacement

Use the following procedures to remove and install the front I/O board.

Remove the front I/O board

Use this information to remove the front I/O board.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.

- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

d. Remove the memory module, perform one of the following.
  - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
  - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

j. Remove the sideband cable kit. See "Remove the system management sideband cable kit" on page 327.

k. Remove the leakage sensor module. See "Remove the leakage sensor" on page 197.

Step 2. Remove the water loop from the tray. See "Remove the water loop" on page 375.

Step 3. Unfasten three PH1 captive screws on the power distribution board tray (PDB tray).

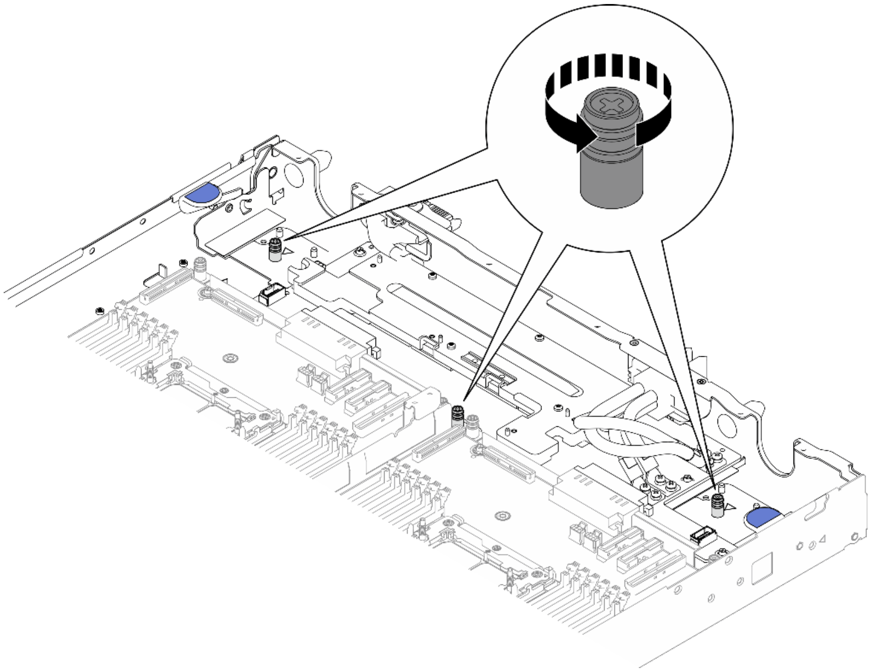


Figure 198. Unfasten three captive screws

Step 4. Remove two PH1 screws from the sides of the tray.

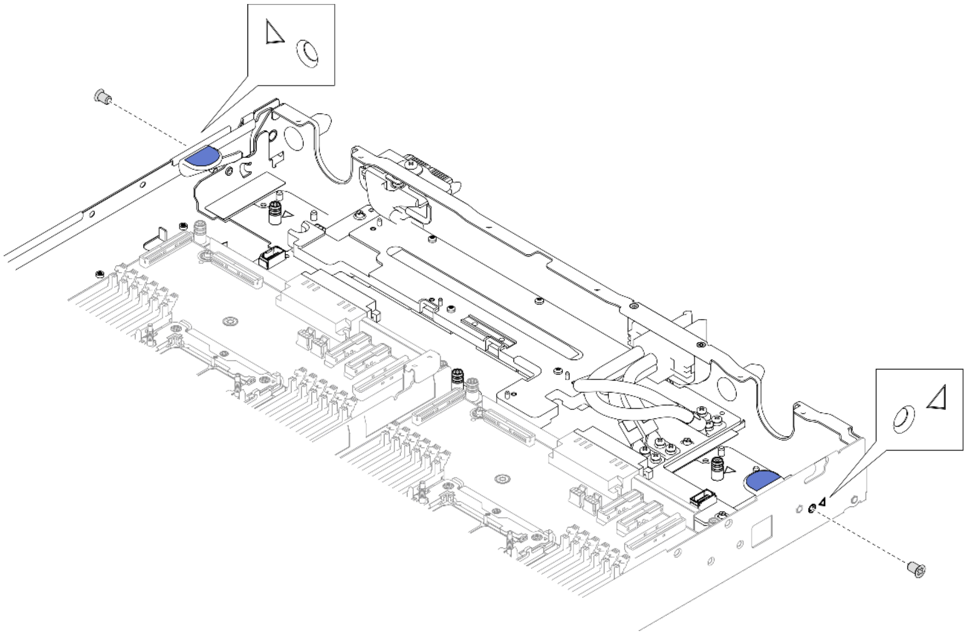
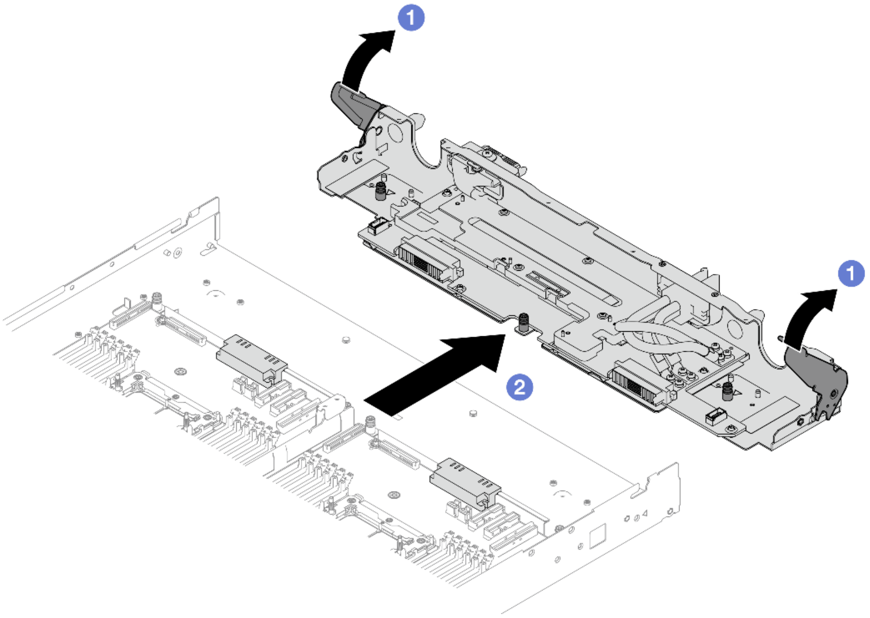


Figure 199. Removing screws from outside of the tray.

Step 5. Remove the power distribution board tray (PDB tray) from the server tray.

a. ❶ Rotate the tray handles to unlock position.

b. ❷ Remove the PDB tray from the server tray.



Step 6. Remove the system-board assembly from the tray.

Note: Hold the system-board assembly by the thumbscrew in the front and the tab beside the power connector.

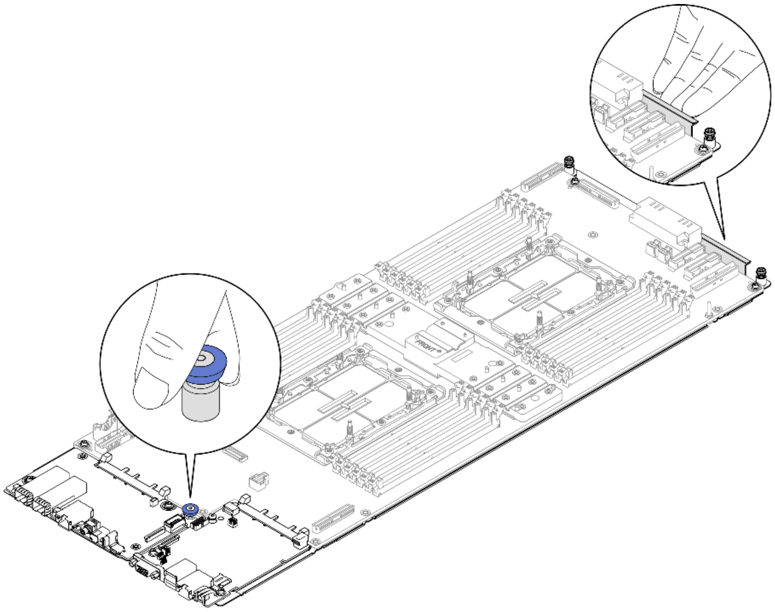


Figure 200. Holding the system-board assembly

a. ① Loosen the two screws in the rear of they system-board assembly.

b. ② Pull up the plunger in the front to release the system-board assembly.

c. ③ Remove the system-board assembly from the tray.

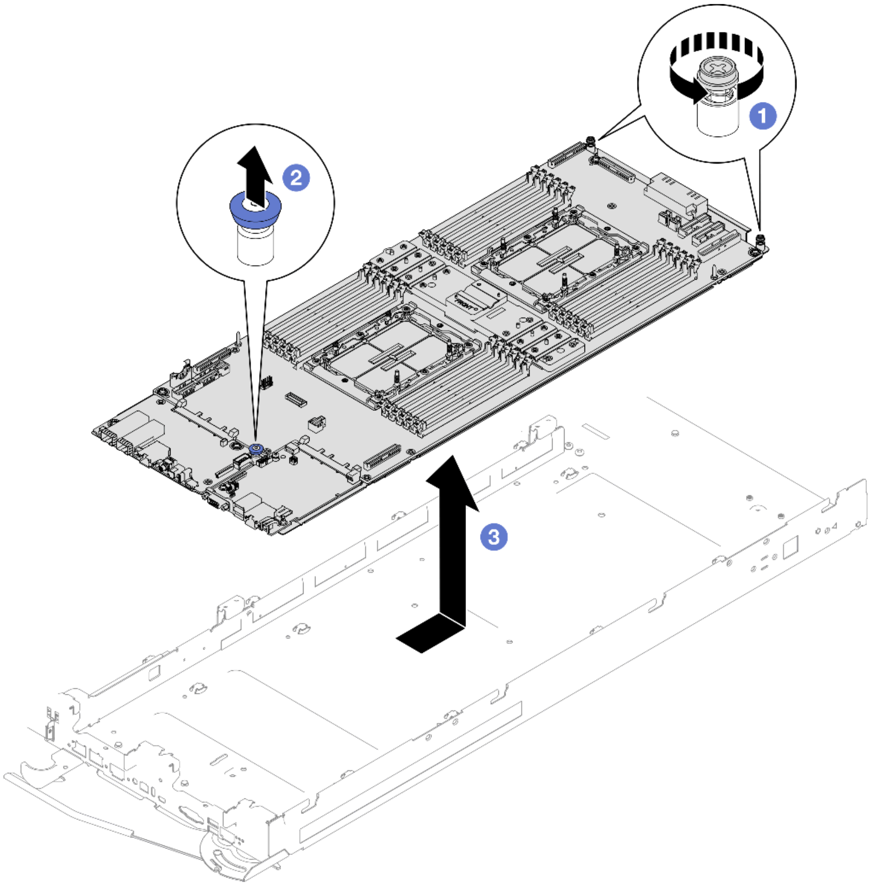


Figure 201. Removing the system-board assembly

Step 7. Disconnect the COM port cable from the front I/O board and the system I/O board.

1 Serial log connector on front I/O board
2 COM port connector on system I/O board

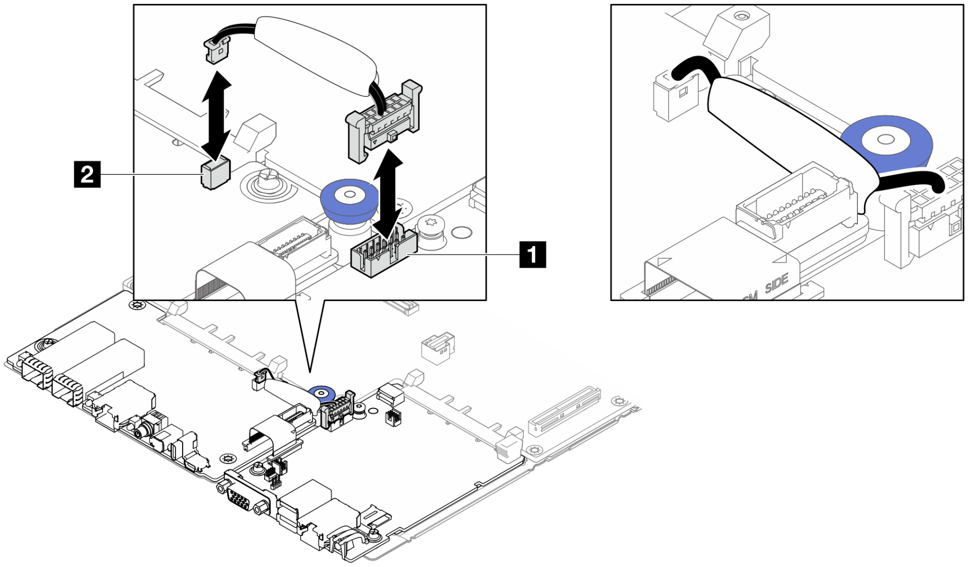


Figure 202. Removing COM port cable

Step 8. Remove the FPC cable.

a. Pull up the latches of the connectors on the front I/O board and the system I/O board.

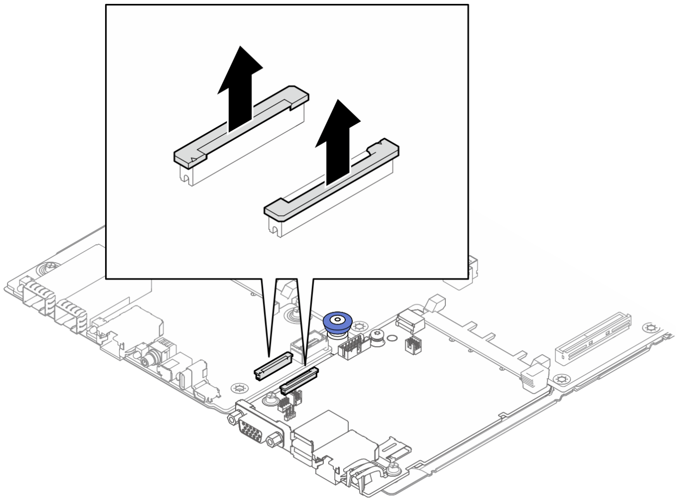


Figure 203. Pulling up connector latches

b. Disconnect the FPC cable from the front I/O board and the system I/O board.

FPC cable connection to FIO board and system I/O board		
From		**To**
FPC cable end marked as FIO SIDE	→	FIO SIDE connector on Front I/O board
FPC cable end marked as SCM SIDE	→	PHY CONN connector on system I/O board

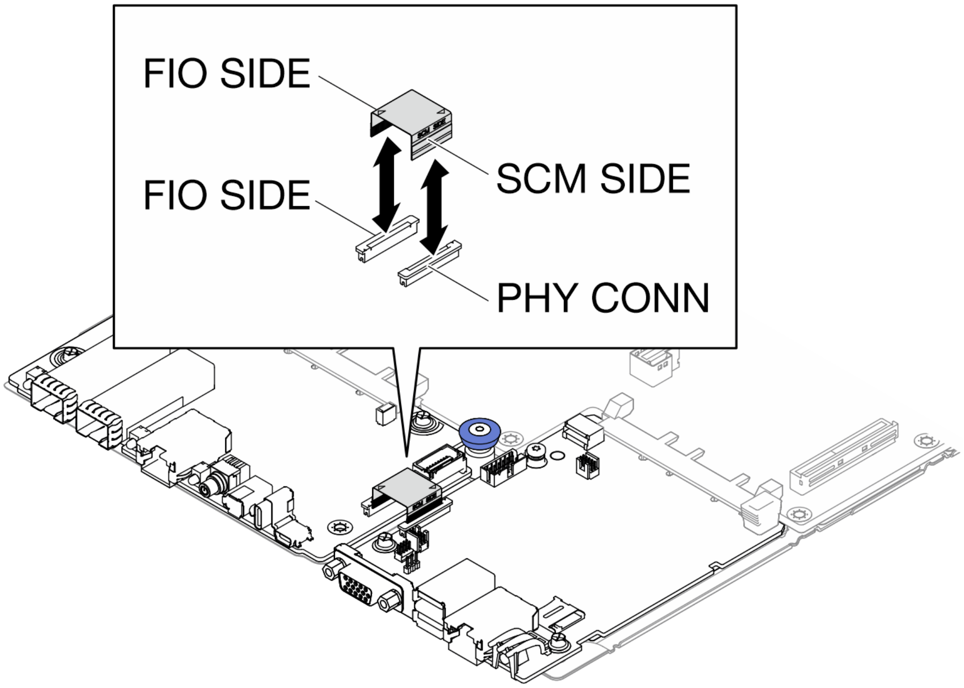


Figure 204. FPC cable connection

Step 9. Remove the front I/O board.

a. ❶ Remove two M3 PH1 screws from the front I/O board.

b. ❶ Remove the front I/O board from the system board assembly.

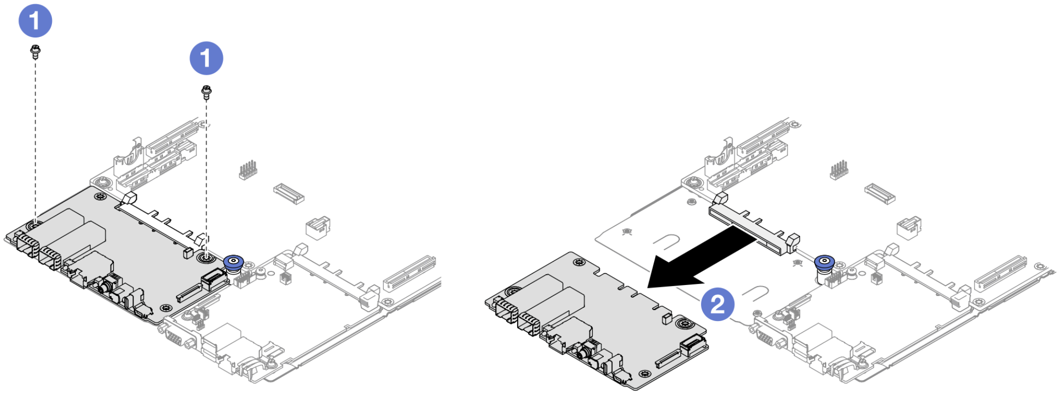


Figure 205. Removing the front I/O board

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the front I/O board

Use this information to install the front I/O board.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install the front I/O board to the system board assembly.

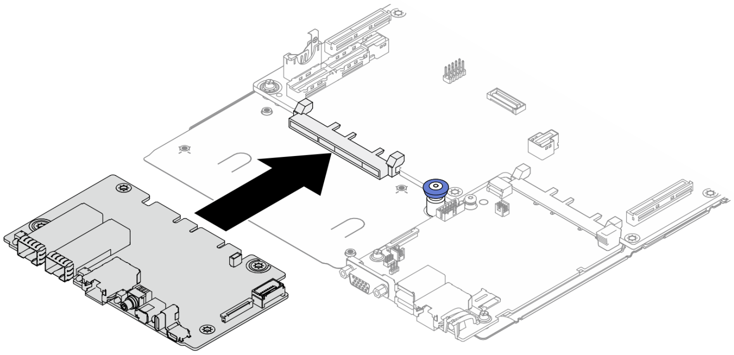


Figure 206. Installing the front I/O board

Step 2. There is a Mylar sheet between the front I/O board and the supporting metal sheet.

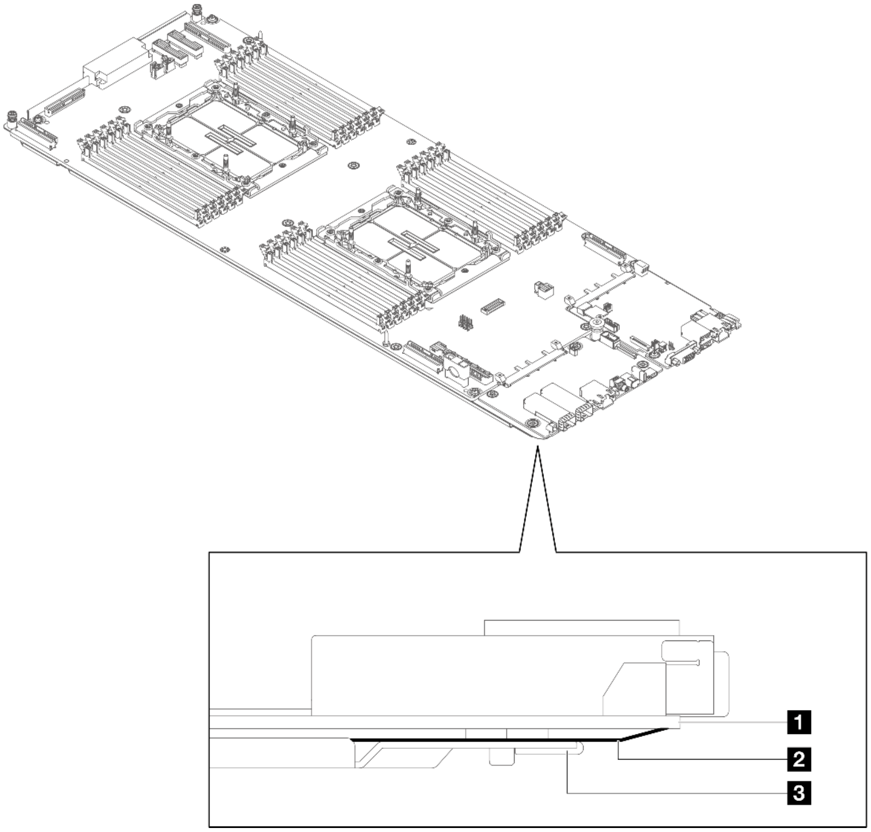


Figure 207. Side view of front I/O board portion of the system-board assembly

1 Front I/O board	**2** Mylar sheet	**3** Supporting sheet metal

a. Insert the tip of the DIMM tool between the front I/O board and the Mylar sheet. Then, use the tip to press down the Mylar sheet to prevent the dip pins on the bottom of the FIO board sticking to the Mylar sheet.

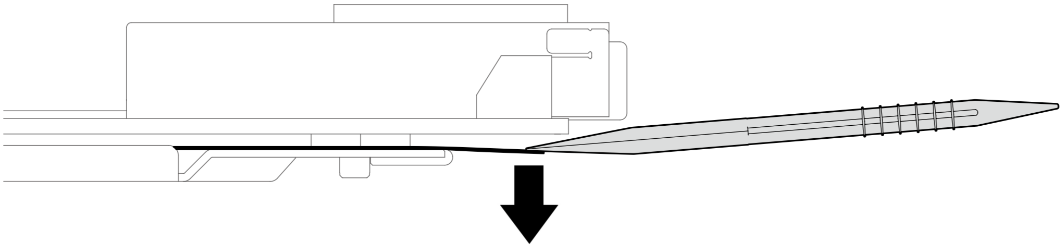


Figure 208. Separating Mylar sheet from front I/O board

Step 3. Install two M3 PH1 screws to secure the front I/O board to the system board assembly.

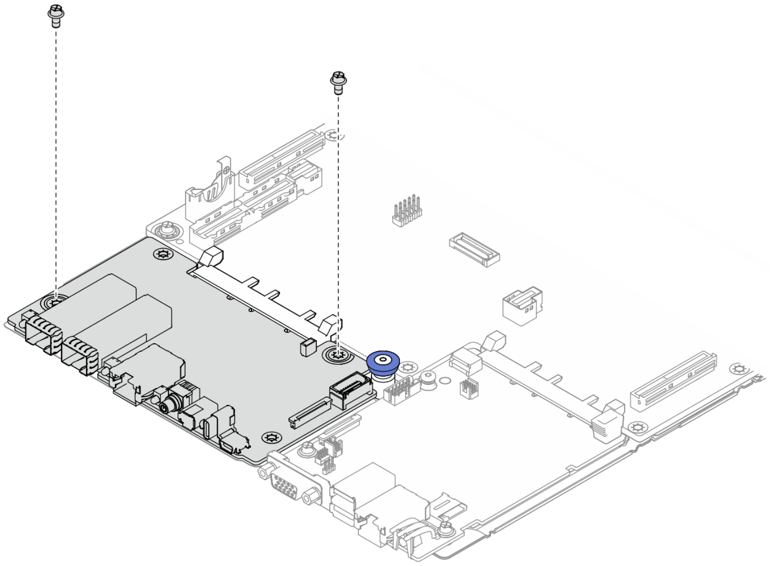


Figure 209. Installing front I/O board screws

Step 4. Install the FPC cable to the front I/O board and the system I/O board.

a. Pull up the latch of the connectors on the front I/O board and the system I/O board.

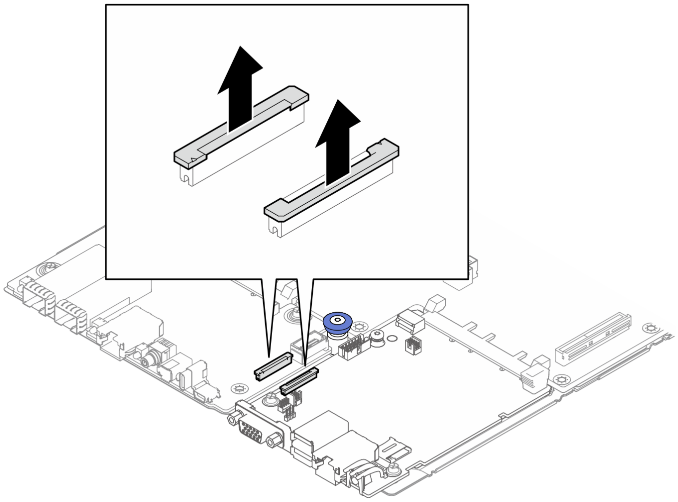


Figure 210. Pulling up connector latches

b. Match the silkscreen on the FPC cable and the connectors. Then, install the FPC cable to the front I/O board and the system I/O board.

FPC cable connection to FIO board and system I/O board		
From		**To**
FPC cable end marked as FIO SIDE	→	FIO SIDE connector on Front I/O board
FPC cable end marked as SCM SIDE	→	PHY CONN connector on system I/O board

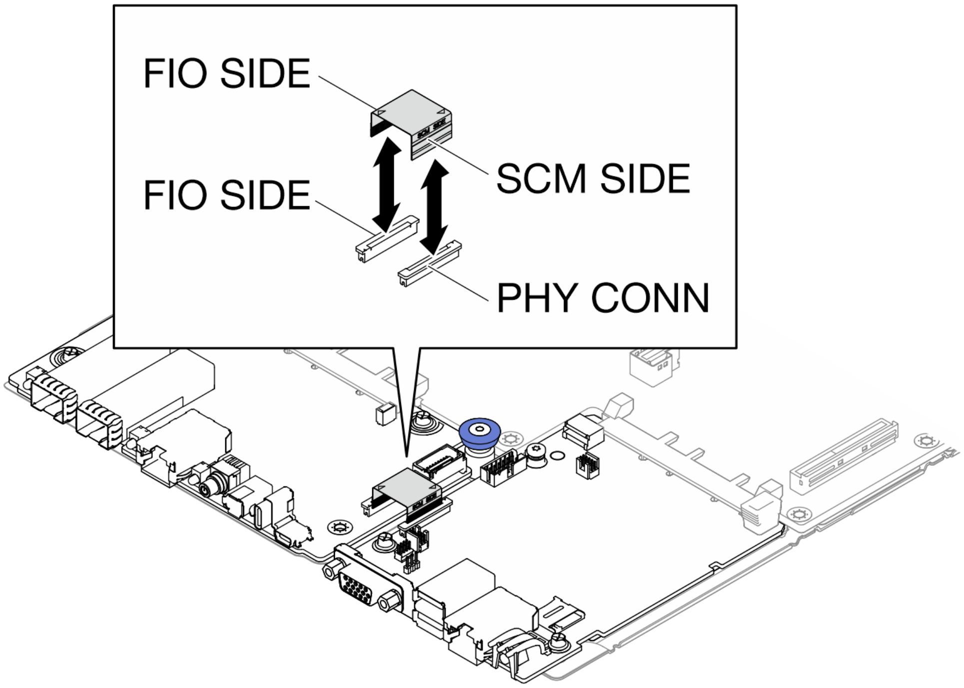


Figure 211. FPC cable connection

c. There is a white line on both ends of the FPC cable. Insert the FPC cable to the connectors until the white lines are invisible. The FPC cable is ***not*** installed correctly if the white lines are visible.

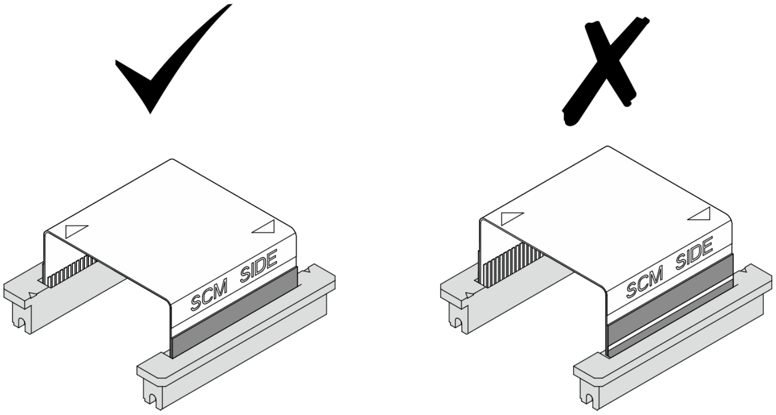


Figure 212. Checking proper FPC cable installation

If the white line is still visible after inserting the FPC cable, check if the connector latches are fully pulled up and loosen.

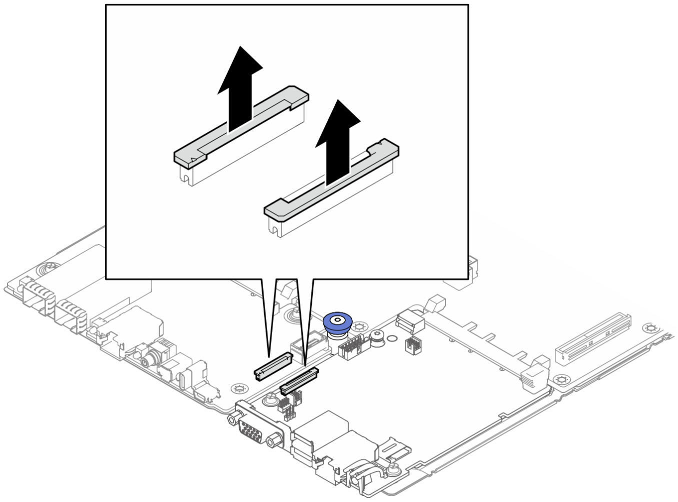


Figure 213. Pulling up connector latches

d. Press the latches to secure the FPC cable to the connectors.

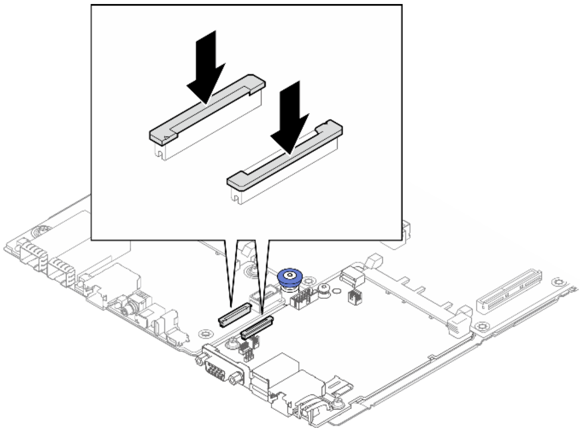


Figure 214. Pressing connector latches

Step 5. A label is attached to the COM port cable. Roll the label around the cable all the way through to prevent label interfering with system connectors and water loop.

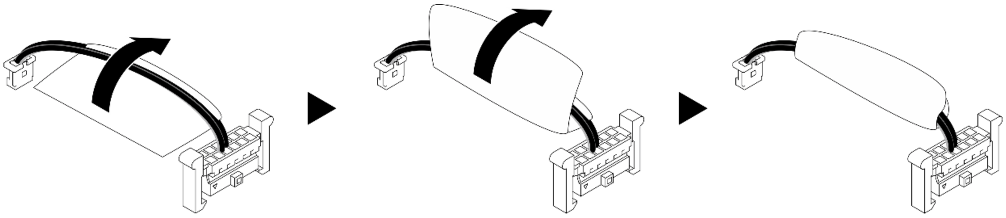


Figure 215. Rolling label around the COM port cable

Step 6. Install the COM port cable to the front I/O board and system I/O board. Place the cable between plunger and serial log connector.

1 Serial log connector on front I/O board
2 COM port connector on system I/O board

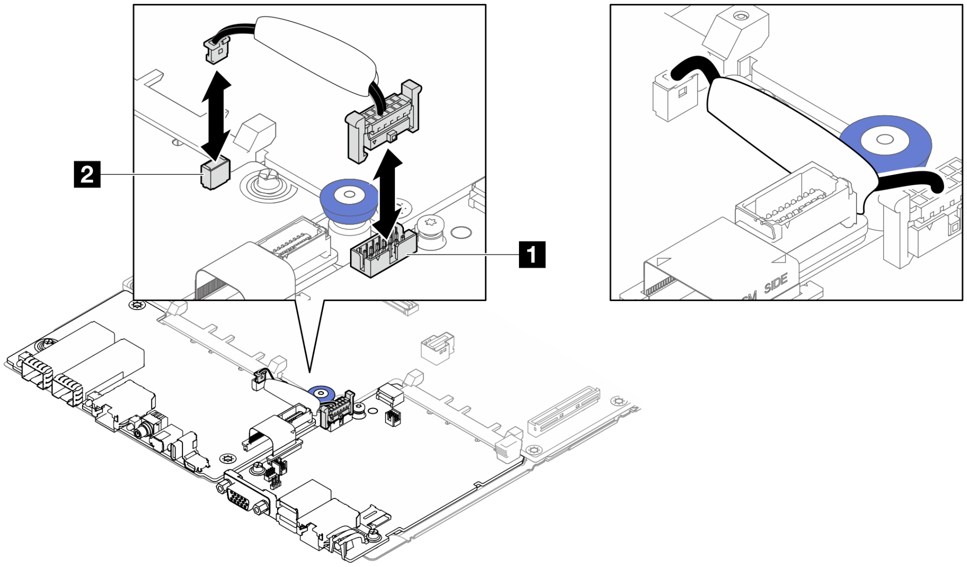


Figure 216. Removing COM port cable

Attention: The COM port cable should be placed between the plunger and the serial log connector.

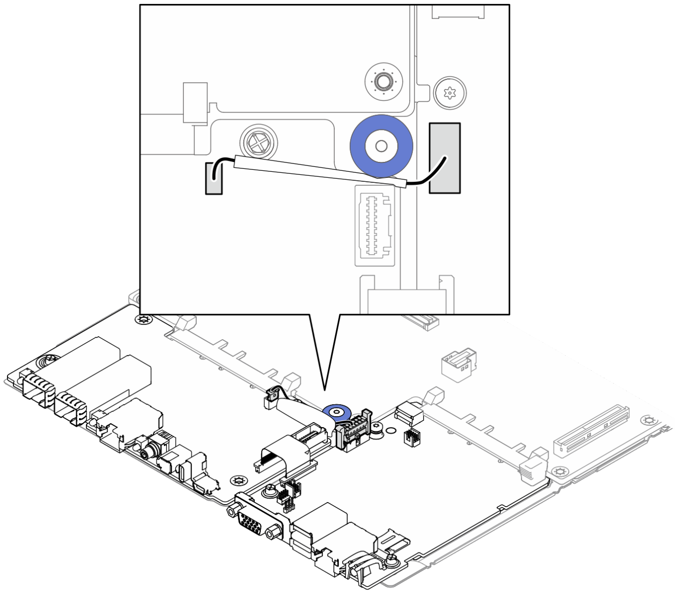


Figure 217. Top view of COM port cable routing

Step 7. Install the system-board assembly to the tray.

Note: Hold the system-board assembly by the thumbscrew in the front and the tab beside the power connector.

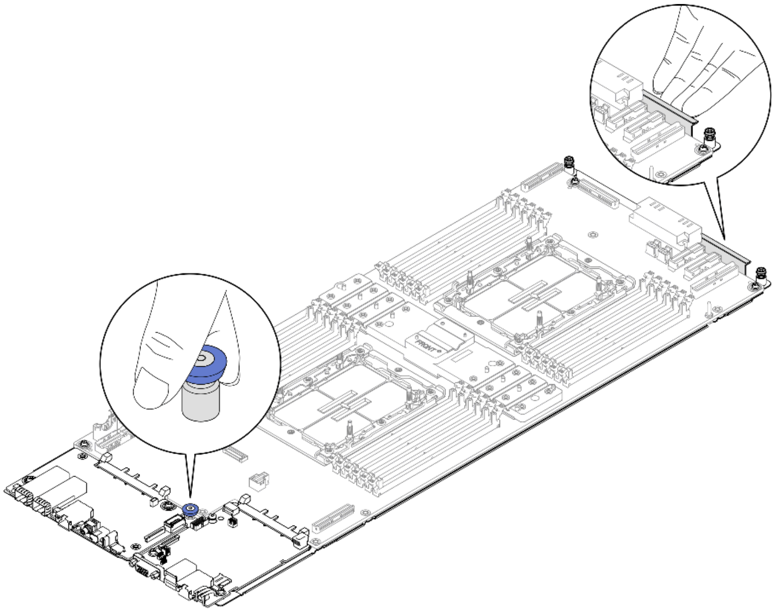


Figure 218. Holding the system-board assembly

a. ① Place the system board assembly into the tray.

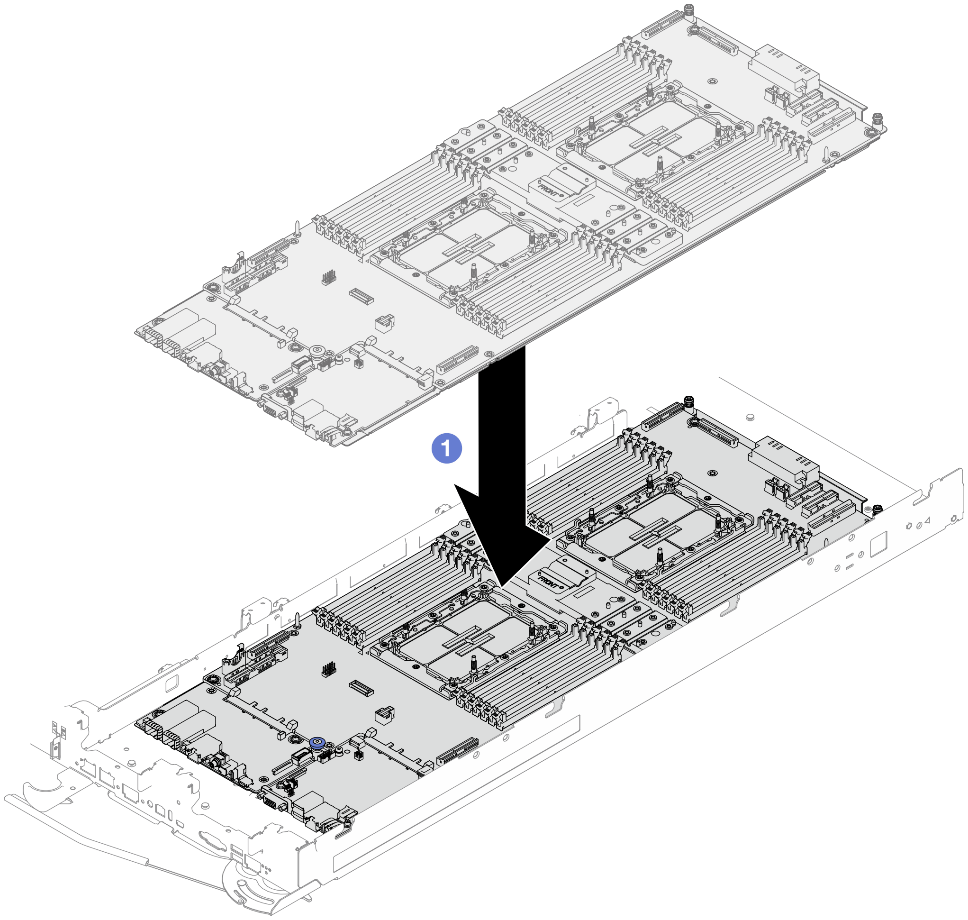


Figure 219. Installing the system-board assembly

b. ② Press the SFP Ethernet ports on the FIO board.

c. ③ While pressing the SFP Ethernet ports, slide the system board assembly forward to secure the front connectors in the corresponding openings on the front bezel.

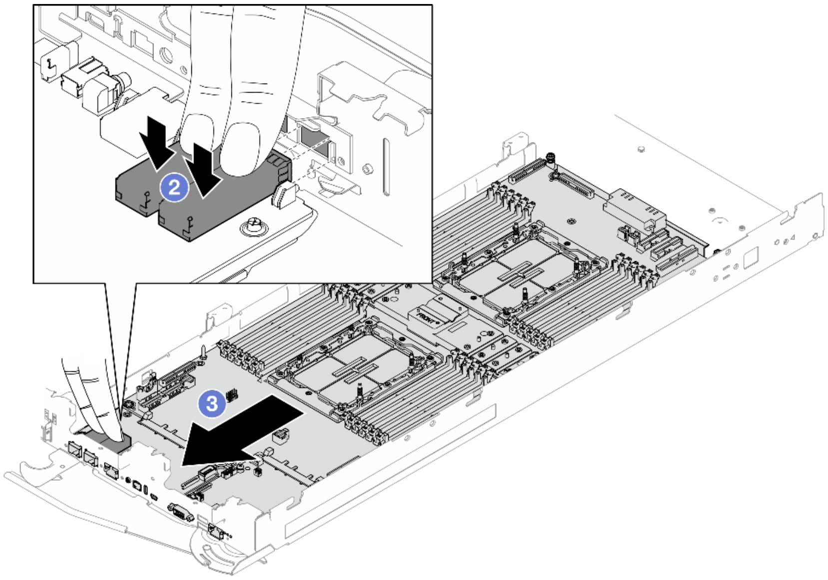


Figure 220. Securing the system board assembly to the tray

Step 8. Make sure the PDB tray handles are rotate to unlock position.

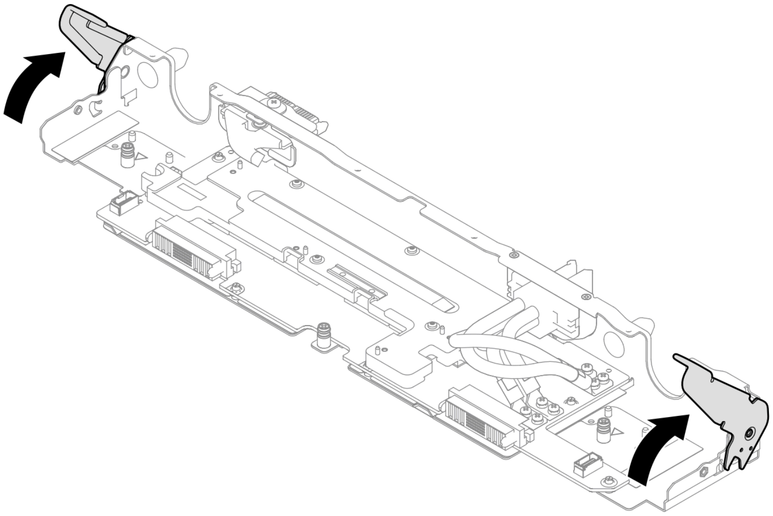


Figure 221. PDB tray handle unlock position

Step 9. Install the PDB tray.

a. ① Align the power connectors on PDB tray to the power connectors to the system boards.

b. ② There are triangle markings on the inside of the right-side and left-side of the tray. Push the PDB tray into the server tray. Stop pushing when the PDB tray meets the triangle markings.

c. ③ Rotate both PDB tray handles **at the same time** to the lock position

Attention: Make sure to rotate both handles at the same time.

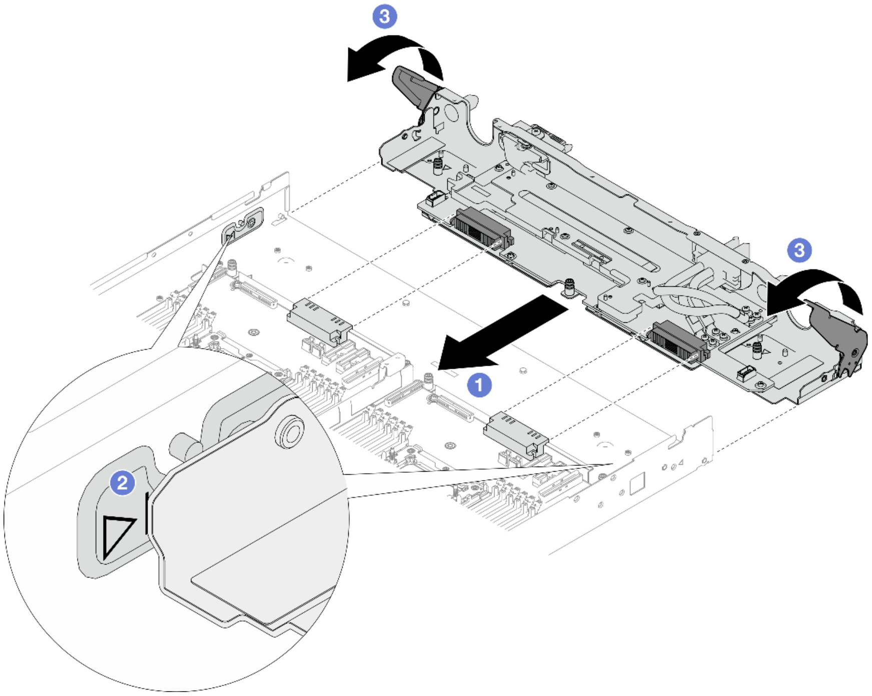


Figure 222. Installing the PDB tray

Step 10. Install two PH1 screws from the outside of the tray.

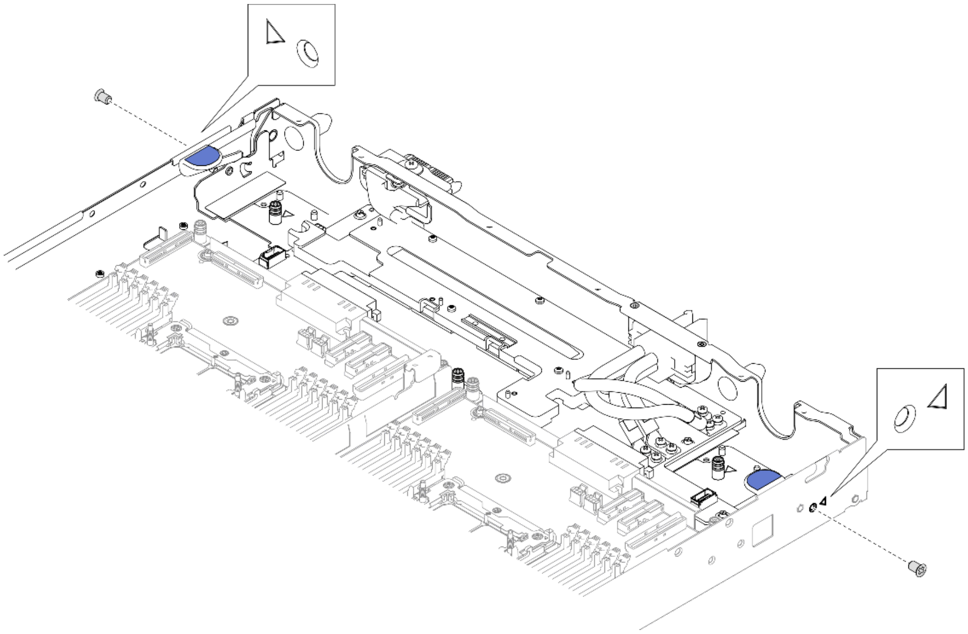


Figure 223. Installing screws from the outside of the tray.

Step 11. Fasten the three PH1 captive screws to install the PDB tray to the server tray.

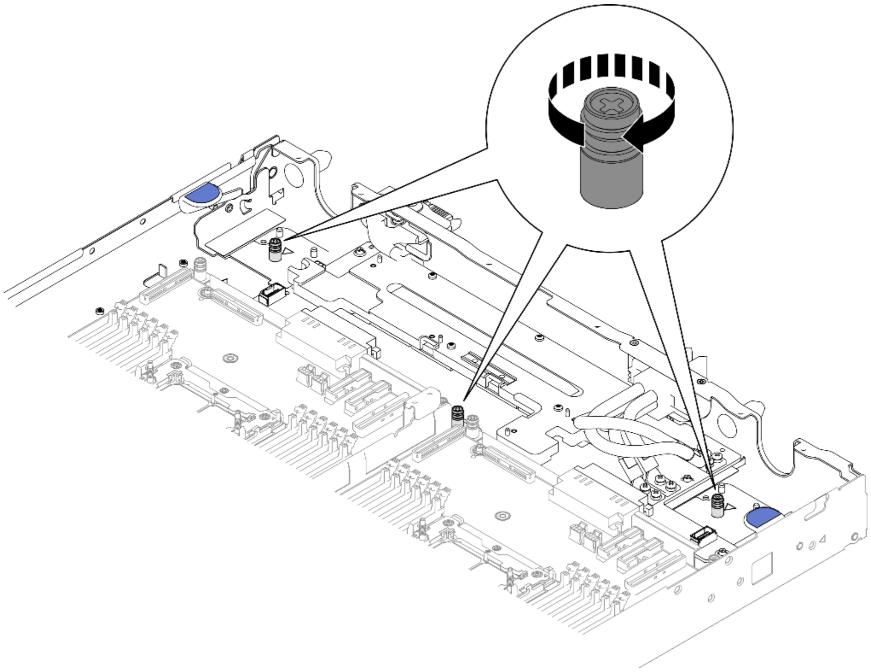


Figure 224. Fastening captive screws

Step 12. Fasten two PH1 captive screws to secure the system-board assembly to the tray.

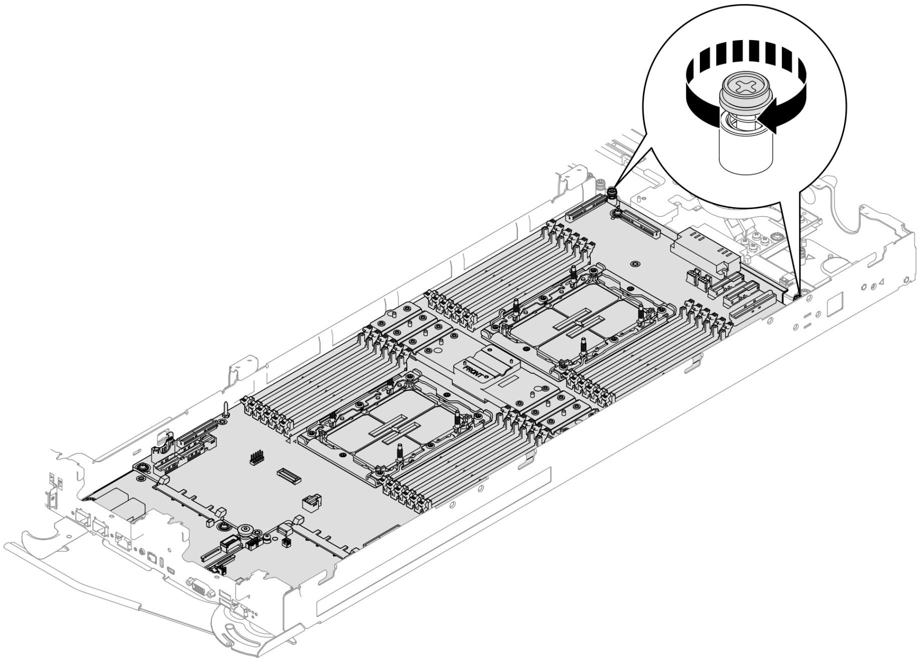


Figure 225. Fastening captive screws on system-board assembly

After you finish

1. Install the water loop. See "Install the water loop" on page 395.
2. Install the leakage sensor. See "Install the leakage sensor" on page 200.
3. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.

4. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
5. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
6. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
7. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
8. Install the cross braces. See "Install the cross braces" on page 109.
9. Install the memory module, perform one of the following.
   - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
   - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
10. Install the DIMM comb. See "Install a DIMM comb" on page 114.
11. Install the tray cover. See "Install the tray cover" on page 373.
12. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
13. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.
14. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Leakage sensor module replacement

Use the following procedures to remove and install a leakage sensor module.

Remove the leakage sensor

Use this information to remove the leakage sensor.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

Step 2. Disconnect the leakage sensor from the power distribution board.

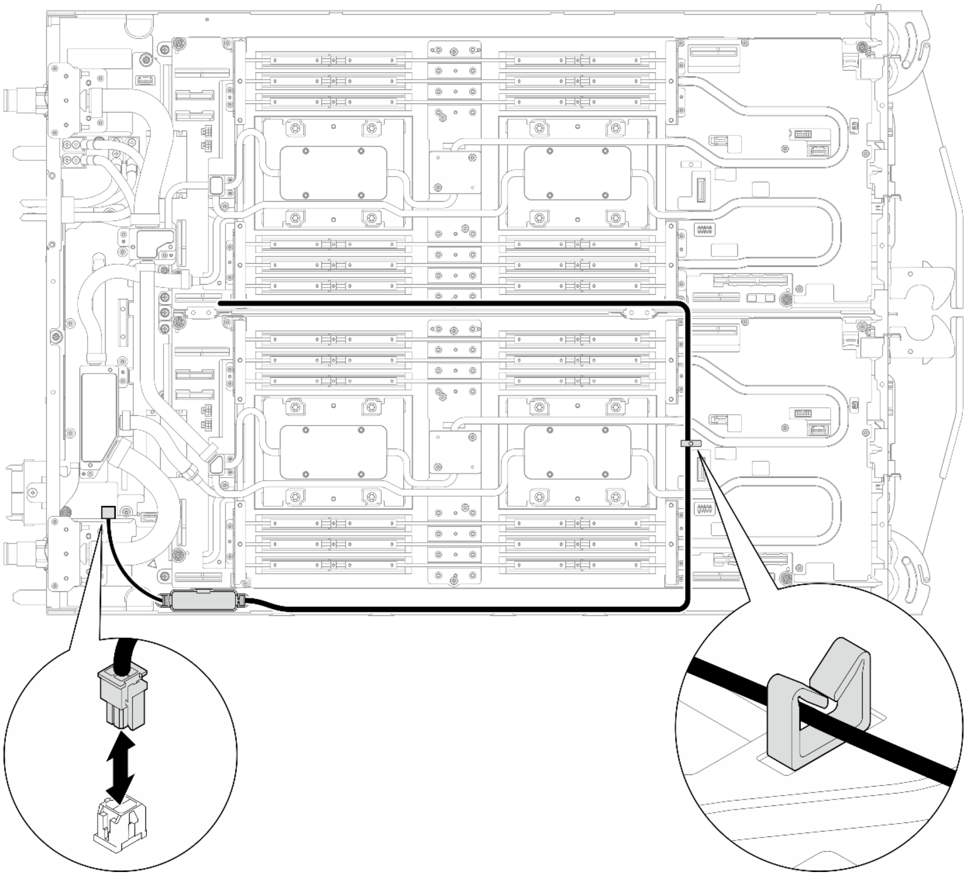


Figure 226. Disconnecting leakage sensor from the PDB

Step 3. Cable-retaining tabs made of Mylar are attached to the middle and bottom wall of the tray. Insert the DIMM tool into each cable-retaining tab to open it; then, remove the leakage sensor cable.

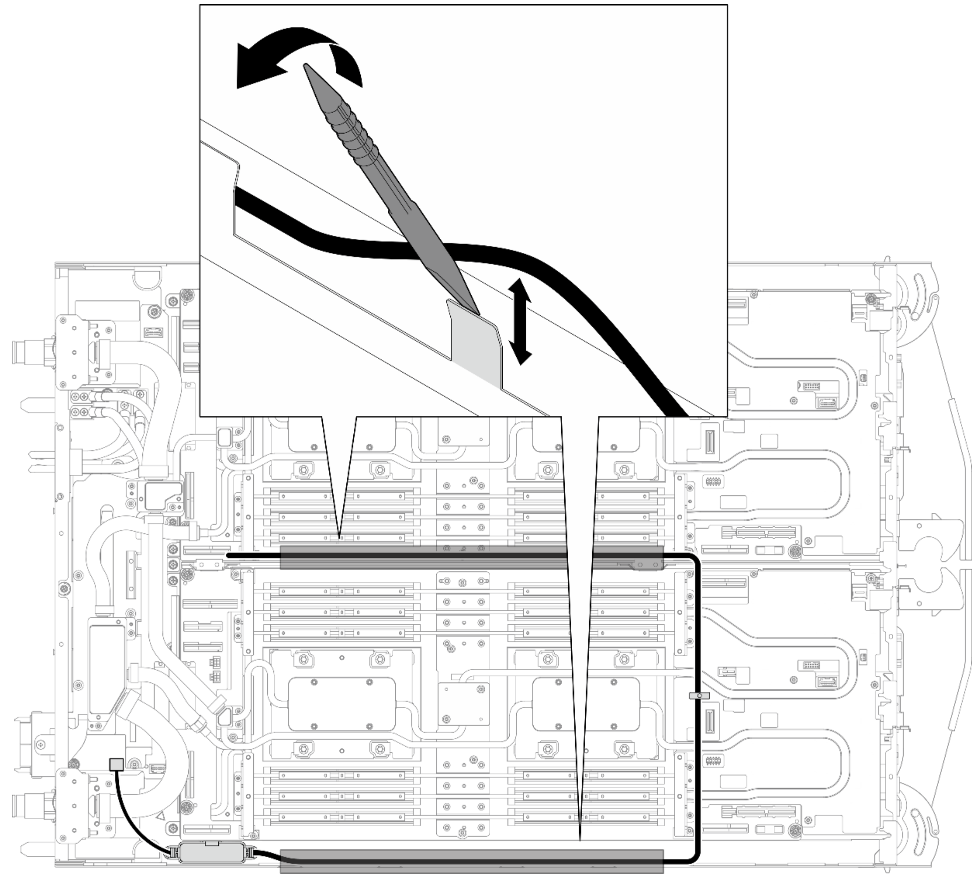


Figure 227. Removing leakage sensor cable from the cable-retaining tabs

Step 4. Remove the leakage sensor from the tray.

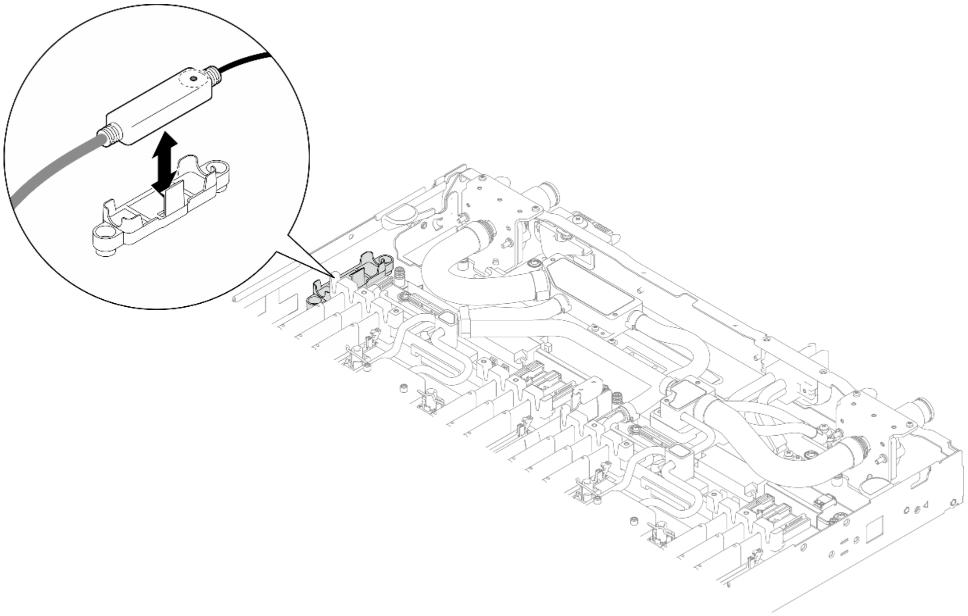


Figure 228. Leakage sensor removal

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the leakage sensor

Use this information to install the leakage sensor.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Install the leakage sensor to the tray.

Note: Keep the side with LED light facing up.

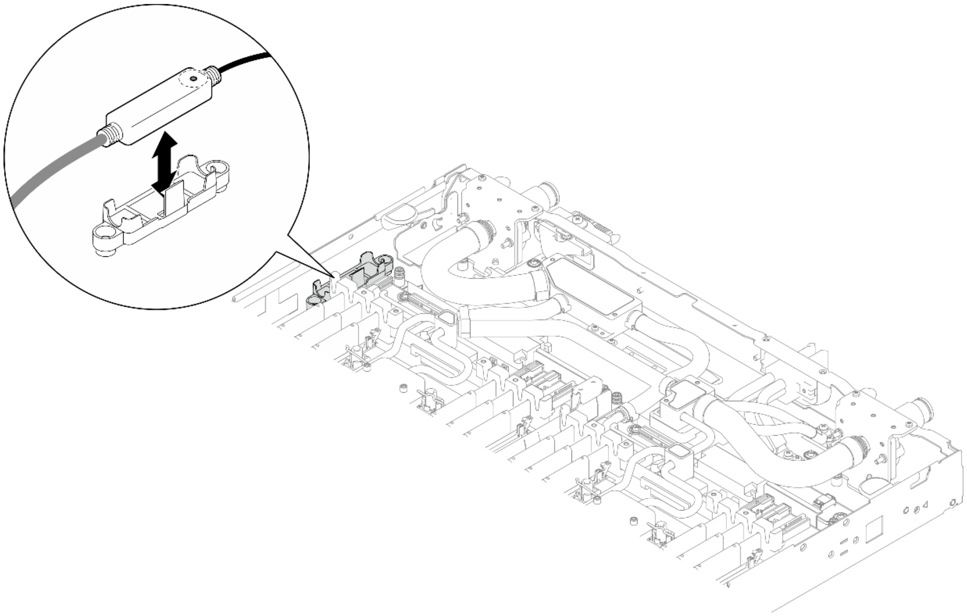


Figure 229. Installing leakage sensor

Step 2. Connect the leakage sensor to the power distribution board. Insert the leakage sensor cable to the cable clip.

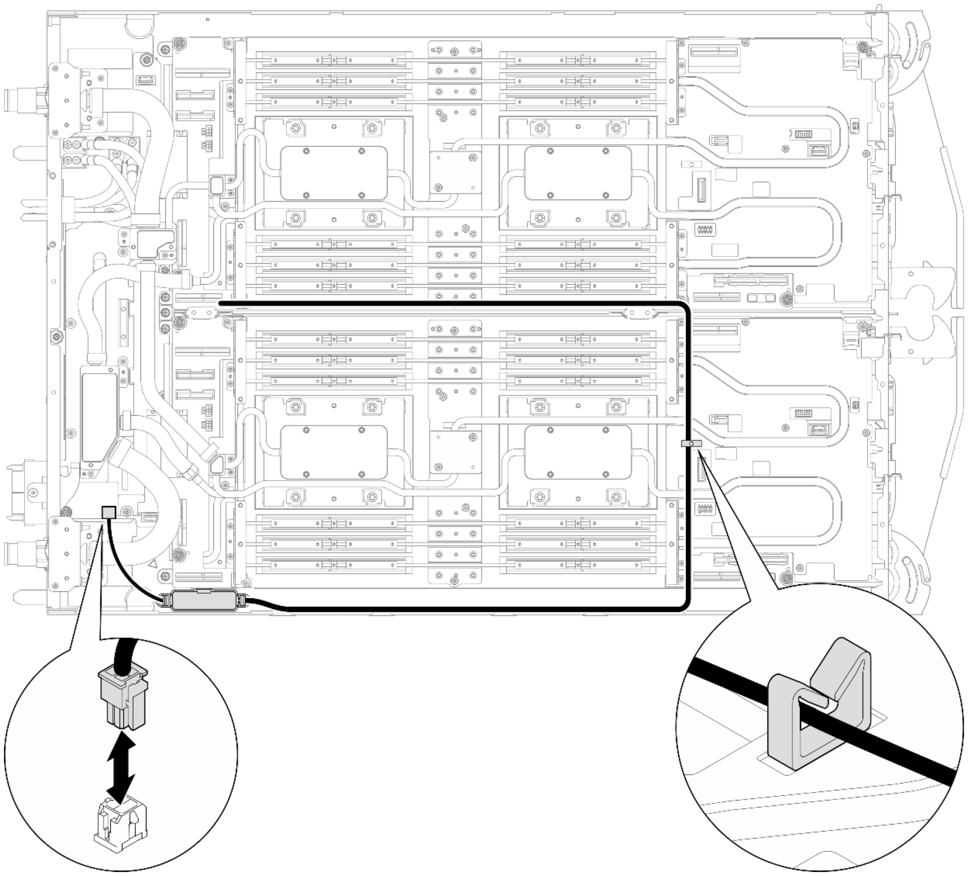


Figure 230. Connecting leakage sensor to the PDB

Step 3. Route the leakage sensor cable as shown in the illustration below. Place the end of the cable next to the PCIe x16 MCIO 4 connector on the system board in Node B. Cable-retaining tabs made of Mylar are attached to the middle and bottom wall of the tray. Insert the DIMM tool into each cable-retaining tab to open it; then, insert the leakage sensor cable into the tab.

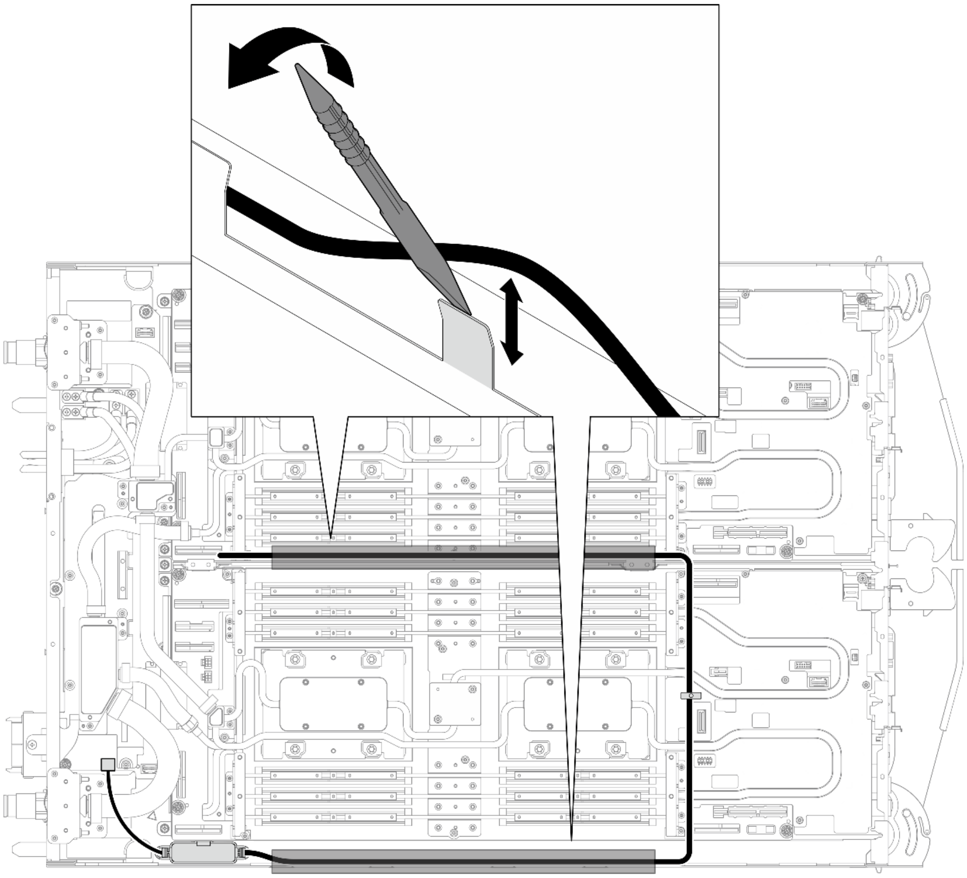


Figure 231. Inserting leakage sensor cable to the cable-retaining tabs

Note: The leakage sensor cable should be inserted into each cable-retaining tab as shown in the illustration below.

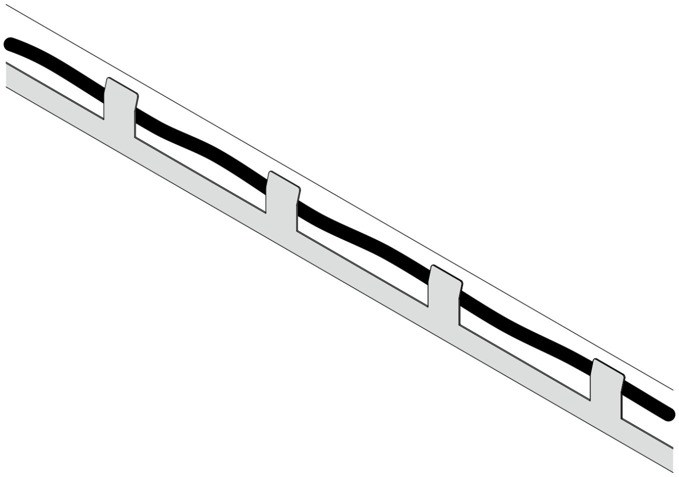


Figure 232. Leakage sensor module inserted into the cable-retaining tabs

After you finish

1. Install the cross braces. See "Install the cross braces" on page 109.
2. Install the tray cover. See "Install the tray cover" on page 373.

3. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
4. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
5. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Memory module (dual-side cooling) replacement

Use the following procedures to remove and install a memory module that requires dual-side cooling.

Important: 128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling. (32GB, 64GB, and 96GB RDIMM require single-side cooling, refer to "Memory module (single-side cooling) replacement" on page 218.)

Remove a memory module (dual-side cooling)

Use this information to remove a memory module that requires dual-side cooling.

Important: 128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling. (32GB, 64GB, and 96GB RDIMM require single-side cooling, refer to "Memory module (single-side cooling) replacement" on page 218.)

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for "Handling static-sensitive devices" on page 36:
  - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
  - Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
  - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
  - Handle memory modules with care: never bend, twist, or drop a memory module.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

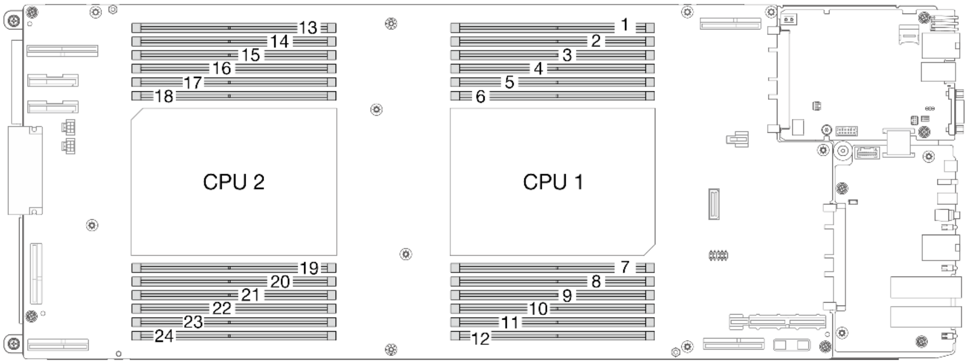


Figure 233. Processor socket and memory module connector location

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Make preparations for this task.

  a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

  b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove the enclosure filler in the enclosure rear.

  a. ① From the enclosure rear, loosen five thumbscrews that secures the filler to the enclosure.

  b. ② Pull out the filler from the enclosure.

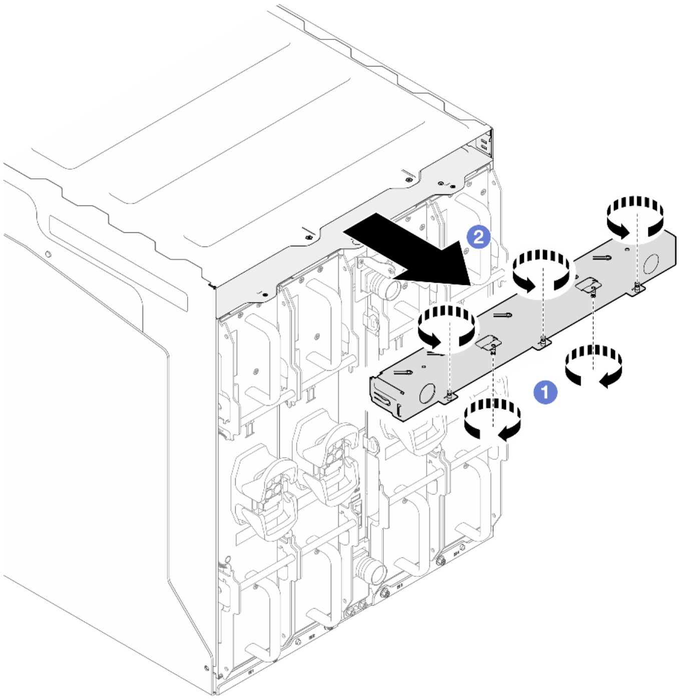


Figure 234. Removing the enclosure filler

Step 3. The DIMM removal tool is magnetically attached to the inside of the filler. Remove the tool from the filler.

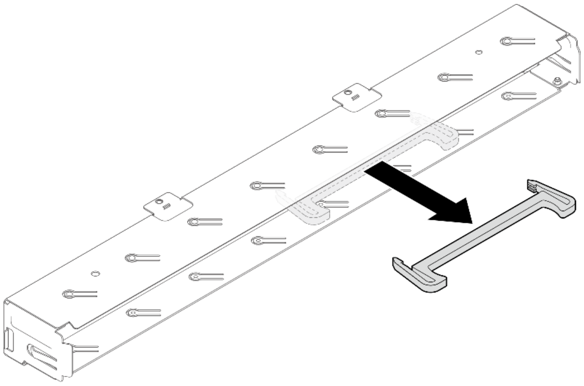


Figure 235. Acquiring the DIMM removal tool

Step 4. Remove the memory module tool attached to the DIMM comb.

Note: Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

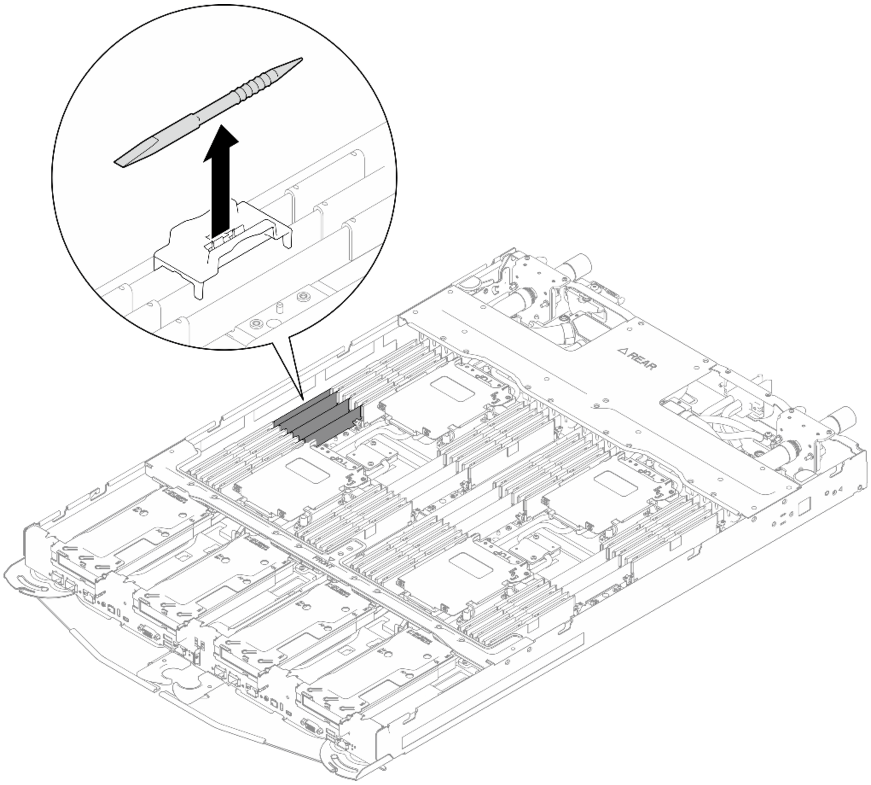


Figure 236. Memory module tool removal

Step 5. Unlock the retaining clips on each end of the memory module connector with the memory module tool.

a. ❶ Place the tip of the tool on the top of the retaining clip.

b. ❷ Press the tool to rotate and unlock the retaining clip.

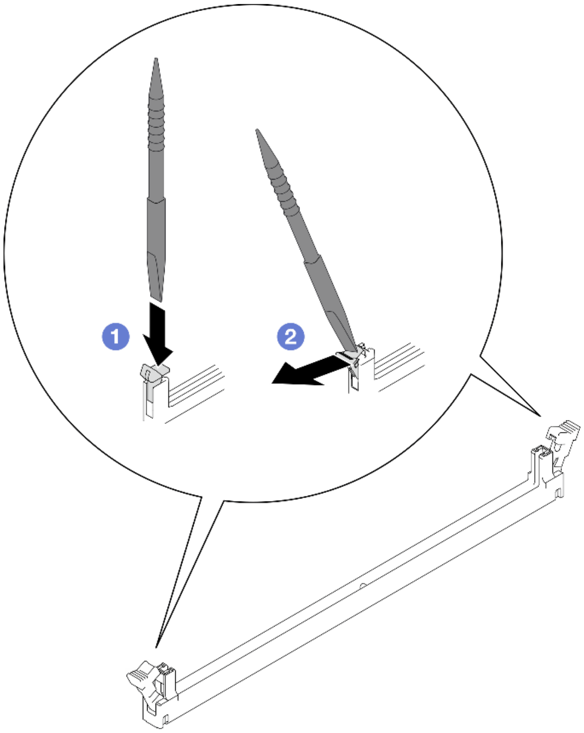


Figure 237. Pressing retaining clips on memory module connector

Attention:

- Memory modules are static-sensitive devices. The package must be grounded before it is opened.
- To avoid breaking the retaining clips or damaging the memory module connectors, open and close the clips gently.

Step 6. Install the DIMM removal tool to the memory module.

a. ❶ Slightly pull out the sides of the tool.

b. ❷ There are slots on the inside of both ends of the tool. Align the slots with the memory module.

c. ❸ Press the tool to the memory module until the tool is attached to the memory module.

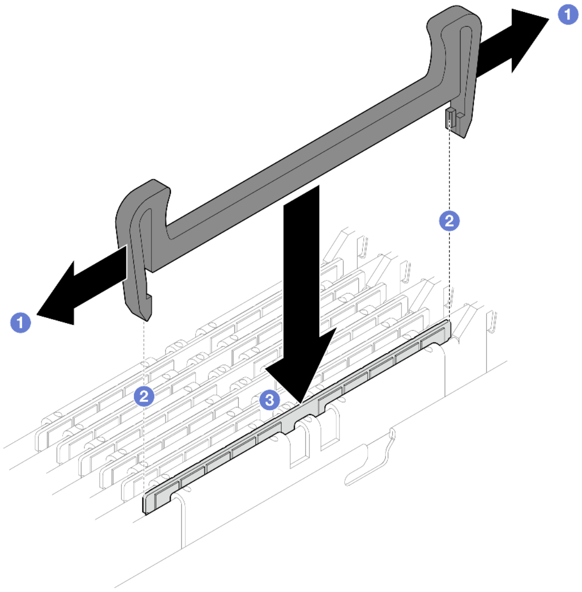


Figure 238. Installing DIMM removal tool to memory module

d. Release the sides of the tool so that the DIMM is fitted to the tool.

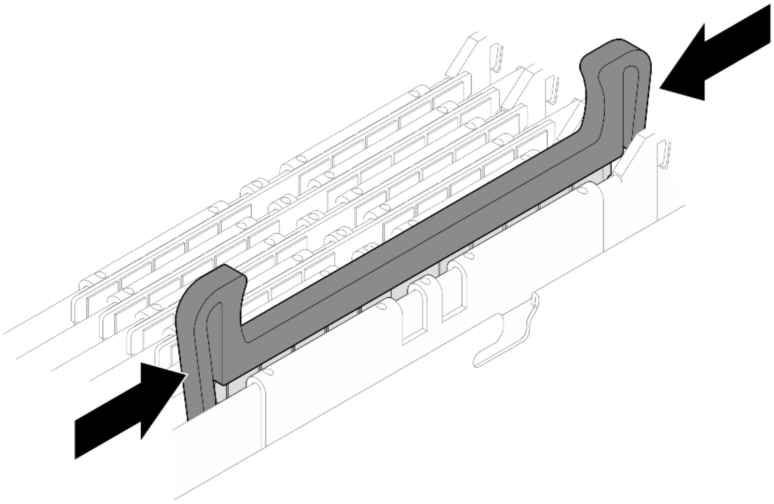


Figure 239. Releasing the sides of the tool

Step 7. Hold the right end and left end of the DIMM removal tool with thumbs and index fingers.

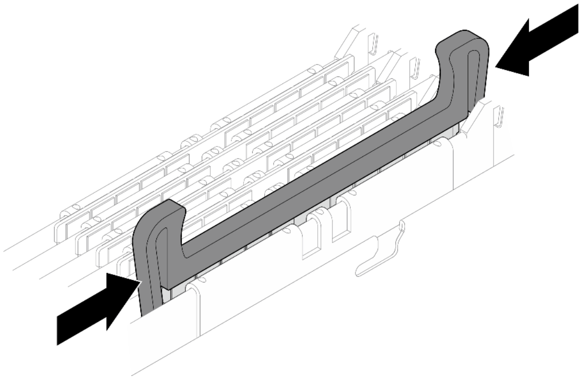


Figure 240. Holding the DIMM removal tools with thumbs and index fingers

Step 8. While holding the DIMM removal tool, remove the DIMM from the DIMM slots. Keep the memory module in parallel with the memory module slots.

Note: Memory module should be in horizontal position during removal.

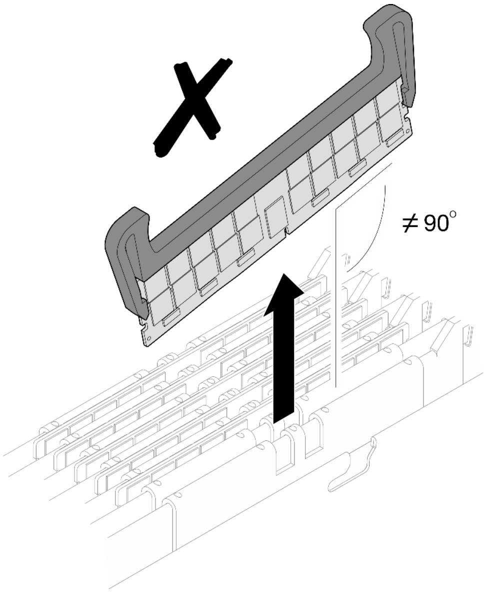


Figure 241. Holding the DIMM removal tools with thumbs and index fingers

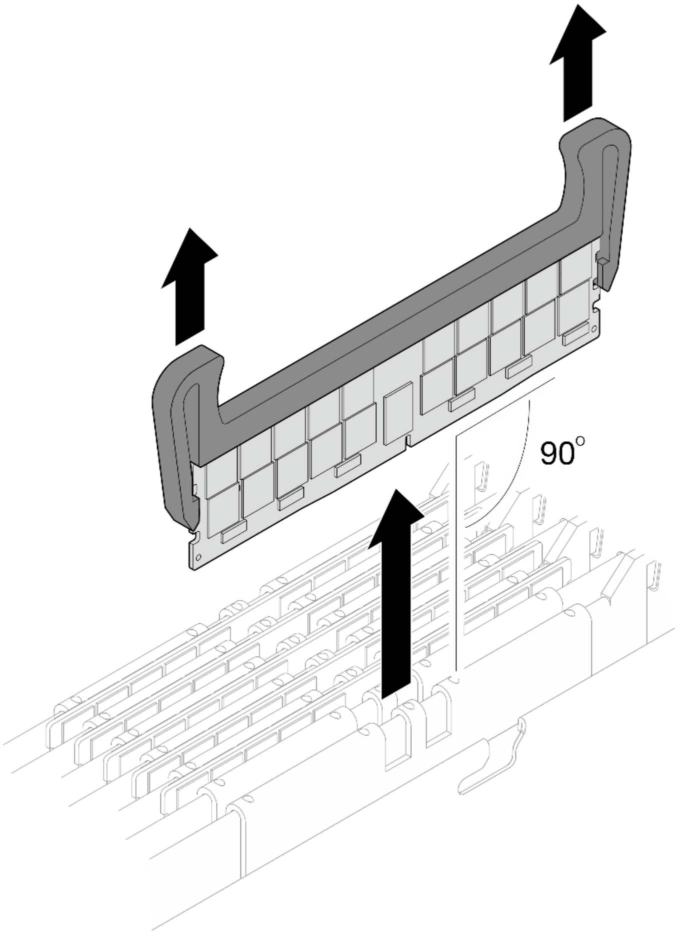


Figure 242. Removing the DIMM

Step 9. Release the tool and remove it from the DIMM.

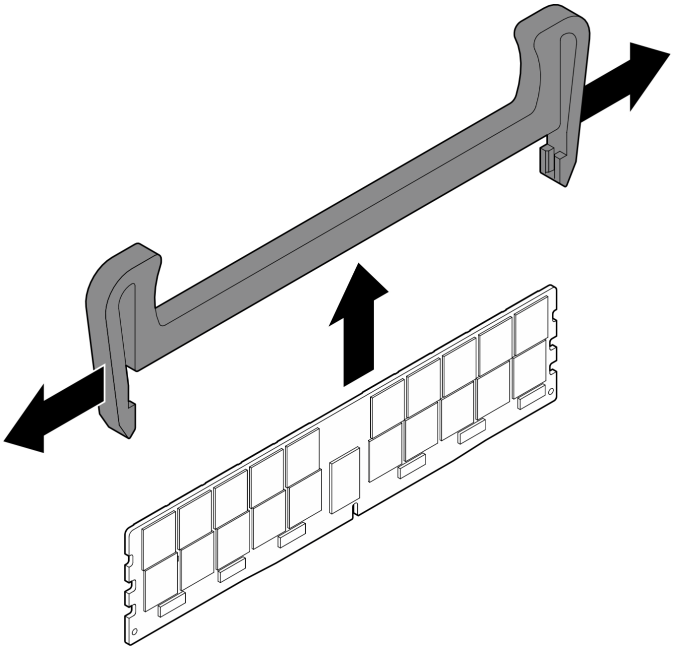


Figure 243. Remove the DIMM removal tool from the DIMM

Step 10. Install the memory module tool to the DIMM comb.

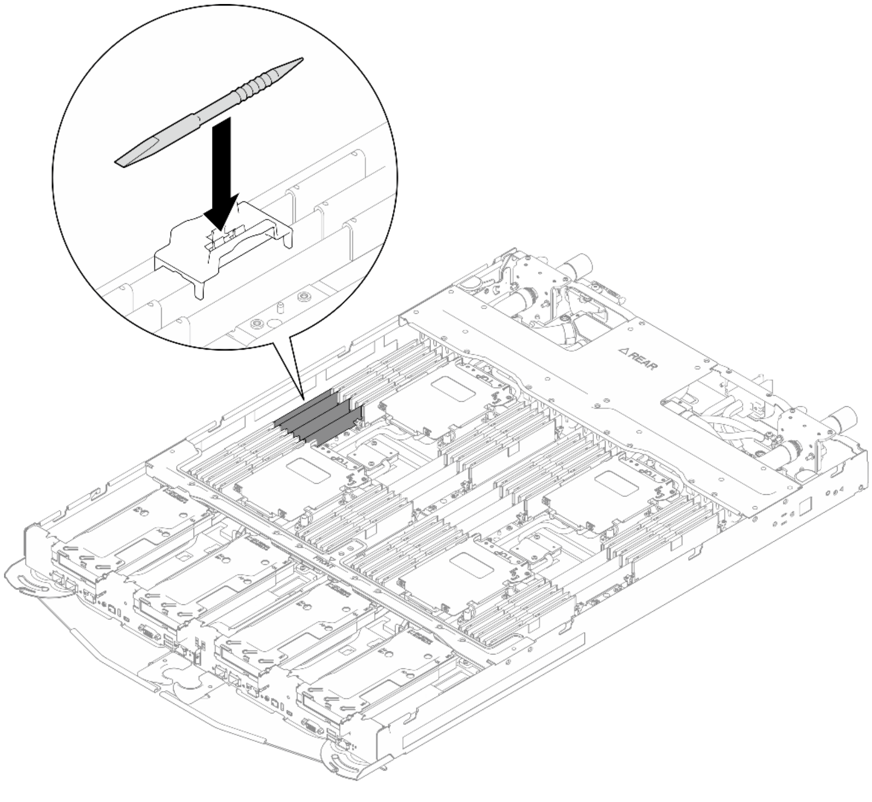


Figure 244. Memory module tool installation

Step 11. Attach the magnetic side of the DIMM removal tool to the inside of the enclosure filler.

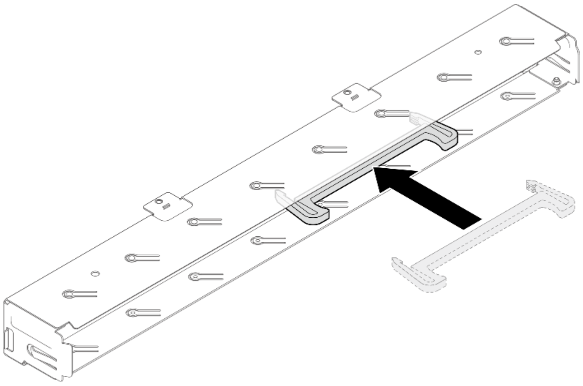


Figure 245. Attaching tool magnetic side to the enclosure inside

Step 12. Install the enclosure filler in the enclosure rear.

a. ① From the enclosure rear, insert the enclosure filler into the enclosure.

b. ② Fasten five thumbscrews to secures the filler to the enclosure.

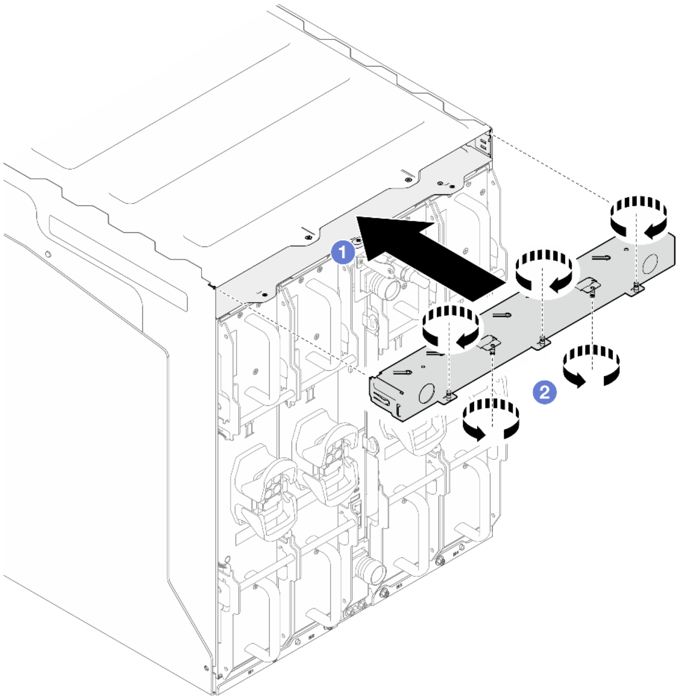


Figure 246. Installing the enclosure filler

After you finish

- Install memory module, see:
  - "Install a memory module (single-side cooling) " on page 226, or
  - "Install a memory module (dual-side cooling) " on page 212
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a memory module (dual-side cooling)

Use this information to install a memory module that require dual-side cooling.

Important: 128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling. (32GB, 64GB, and 96GB RDIMM require single-side cooling, refer to "Memory module (single-side cooling) replacement" on page 218.)

About this task

See "Memory module installation rules and order" on page 36 for detailed information about memory configuration and setup.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for "Handling static-sensitive devices" on page 36:
  - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
  - Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
  - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
  - Handle memory modules with care: never bend, twist, or drop a memory module.
  - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
  - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.
  - DIMM fillers must be installed in unused slots for proper cooling.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

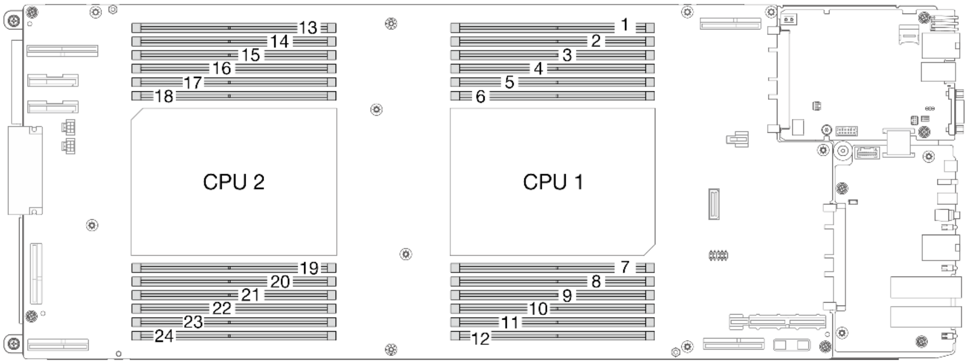


Figure 247. Processor socket and memory module connector location

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. When installing memory module that requires dual-side cooling, DIMM cooling bars must be installed in the tray. **Make sure** that there are sixteen (16x) DIMM cooling bars installed in the water loop (8x per node). See "Install a DIMM cooling bar" on page 118.

Step 2. Remove the memory module tool attached to the DIMM comb.

Note: Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

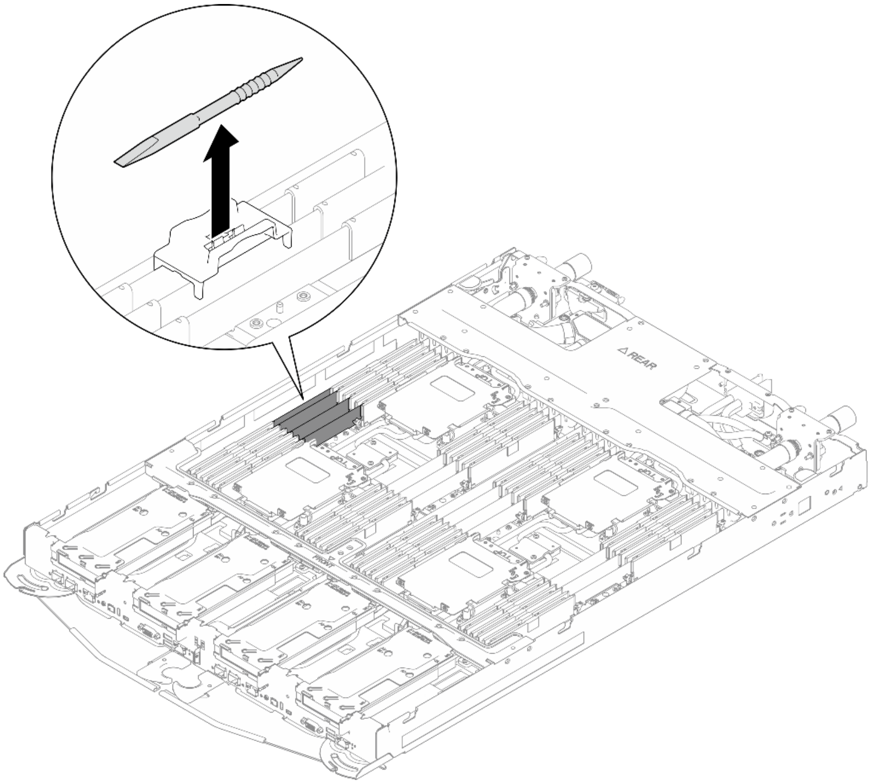


Figure 248. Memory module tool removal

Step 3. Unlock the retaining clips on each end of the memory module connector with the memory module tool.

a. ❶ Place the tip of the tool on the top of the retaining clip.

b. ❷ Press the tool to rotate and unlock the retaining clip.

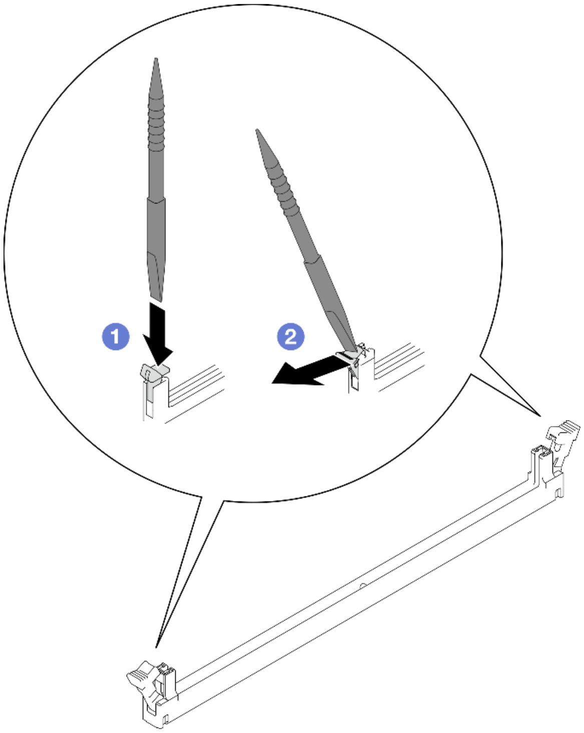


Figure 249. Pressing retaining clips on memory module connector

Attention:

- Memory modules are static-sensitive devices. The package must be grounded before it is opened.
- To avoid breaking the retaining clips or damaging the memory module connectors, open and close the clips gently.

Step 4. Touch the static-protective package that contains the memory module to any unpainted metal surface on the outside of the node; then, remove the memory module from the package.

Step 5. Align the memory module with the slot, and gently place the memory module on the slot with both hands.

Step 6. Install the memory module.

a. Hold the right end and left end of the memory module at the same time and keep it in parallel with the connector.

b. Align the memory module with the connector while gently placing it onto the connector. Then, firmly press both ends of the memory module straight down into the connector until the retaining clips snap into the locked position.

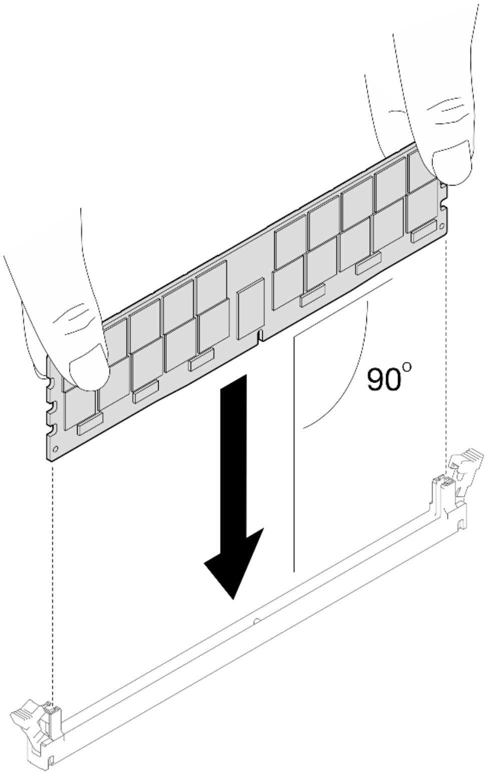
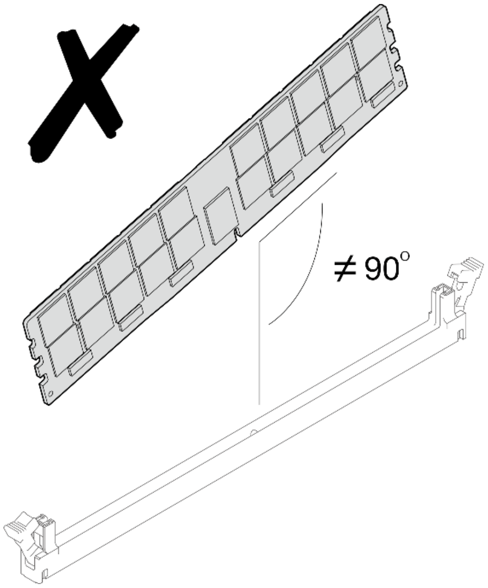


Figure 250. Memory module installation

Note: Memory module should be in horizontal position during installation.



Step 7. Make sure the retaining clips are properly locked. If the retaining clips are open, firmly press right and left ends of the memory module until the clips are locked.

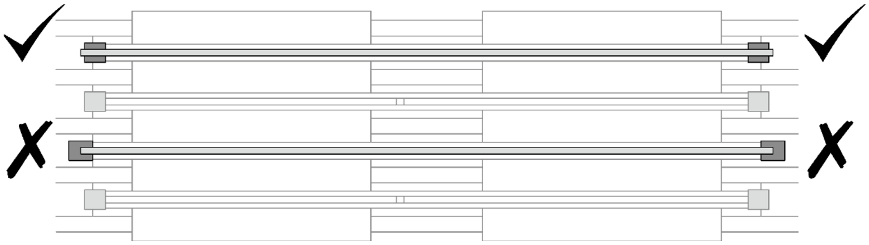


Figure 251. Open and locked retaining clips on memory module connector

Step 8. Install the memory module tool to the DIMM comb.

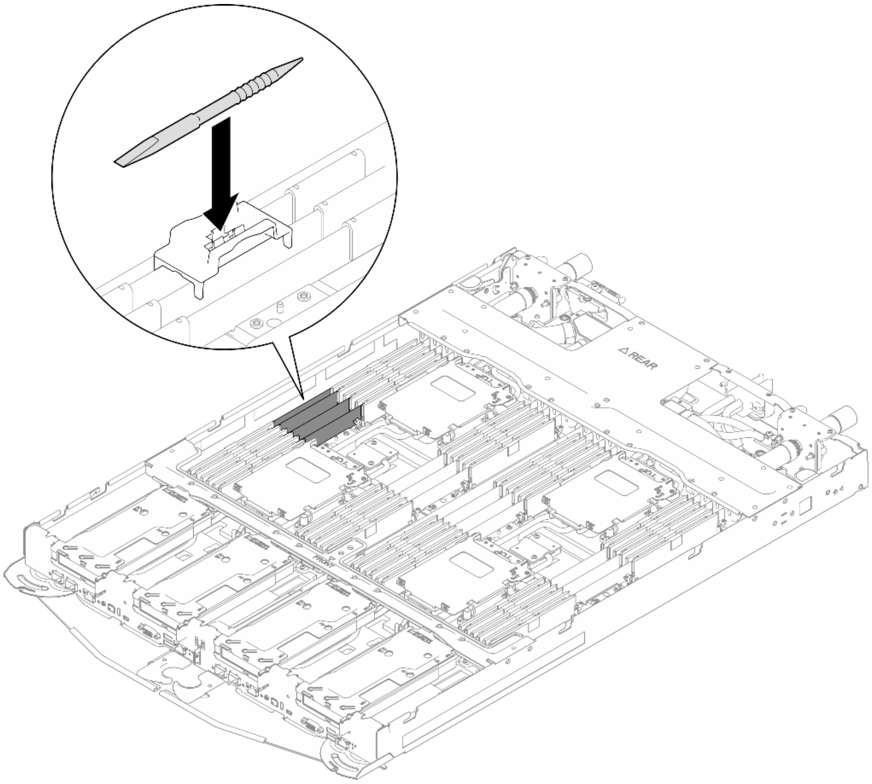


Figure 252. Memory module tool installation

After you finish

1. Install the tray cover. See "Install the tray cover" on page 373.
2. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Memory module (single-side cooling) replacement

Use the following procedures to remove and install a memory module that requires single-side cooling.

Important: 32GB, 64GB, and 96GB RDIMM require single-side cooling. (128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling, refer to "Memory module (dual-side cooling) replacement" on page 203.)

Remove a memory module (single-side cooling)

Use this information to remove a memory module that requires single-side cooling.

Important: 32GB, 64GB, and 96GB RDIMM require single-side cooling. (128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling, refer to "Memory module (dual-side cooling) replacement" on page 203.)

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for "Handling static-sensitive devices" on page 36:
  - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
  - Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
  - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
  - Handle memory modules with care: never bend, twist, or drop a memory module.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

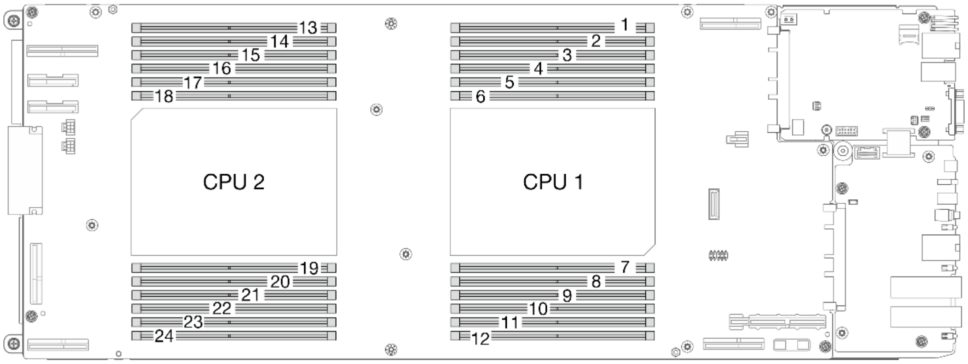


Figure 253. Processor socket and memory module connector location

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

Step 2. Remove the memory module tool attached to the DIMM comb.

Note: Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

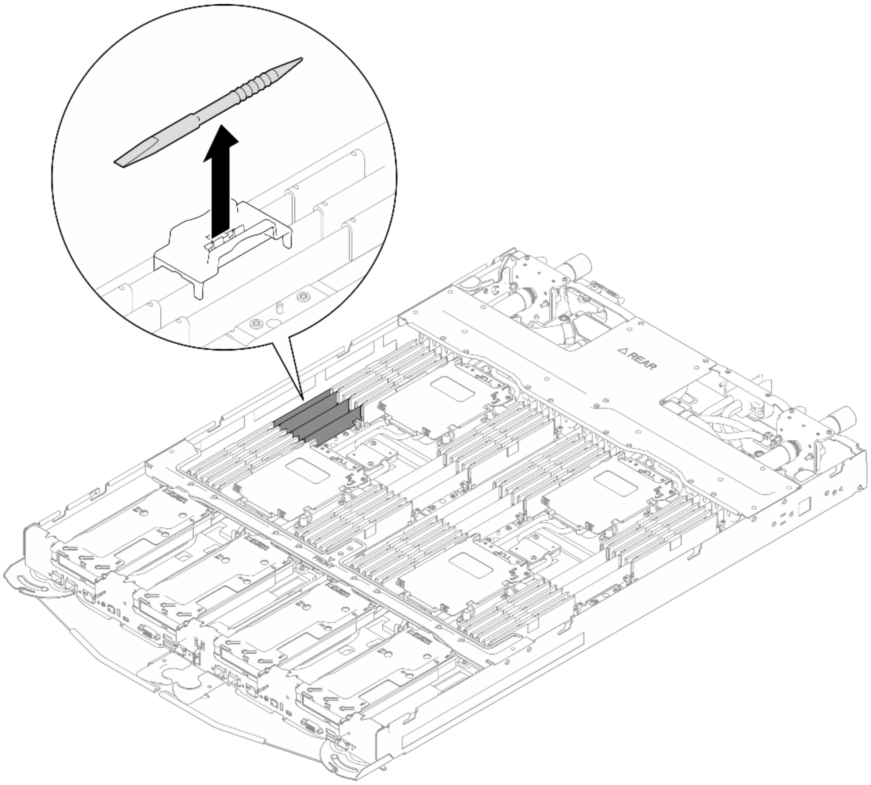


Figure 254. Memory module tool removal

Step 3. Remove the DIMM cover.

Note: Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.

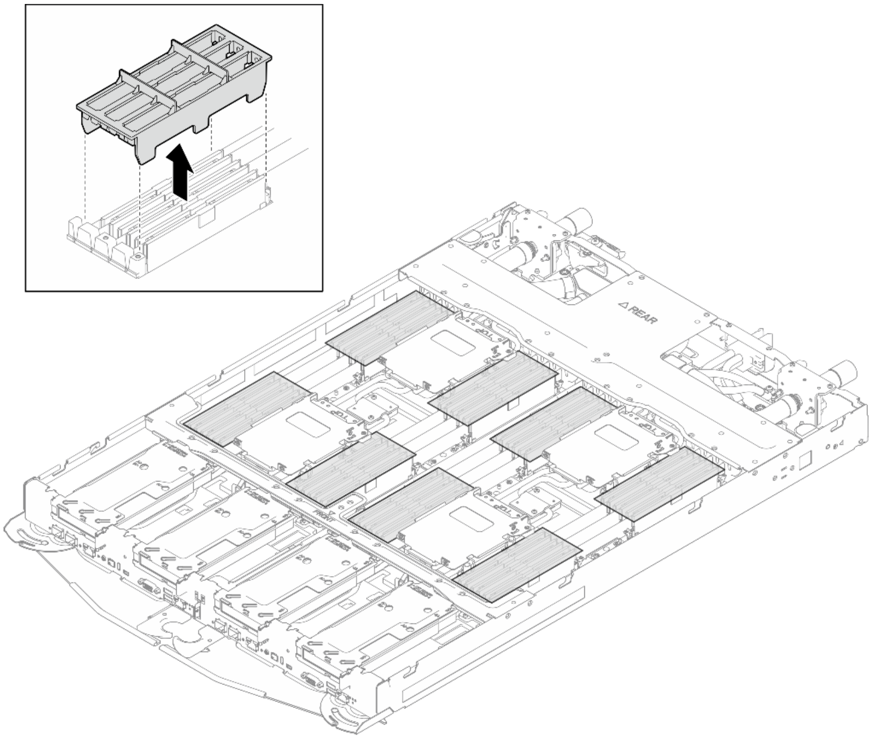


Figure 255. DIMM cover removal

Step 4. Unlock the retaining clips on each end of the memory module connector with the memory module tool.

a. ① Place the tip of the tool on the top of the retaining clip.

b. ② Press the tool to rotate and unlock the retaining clip.

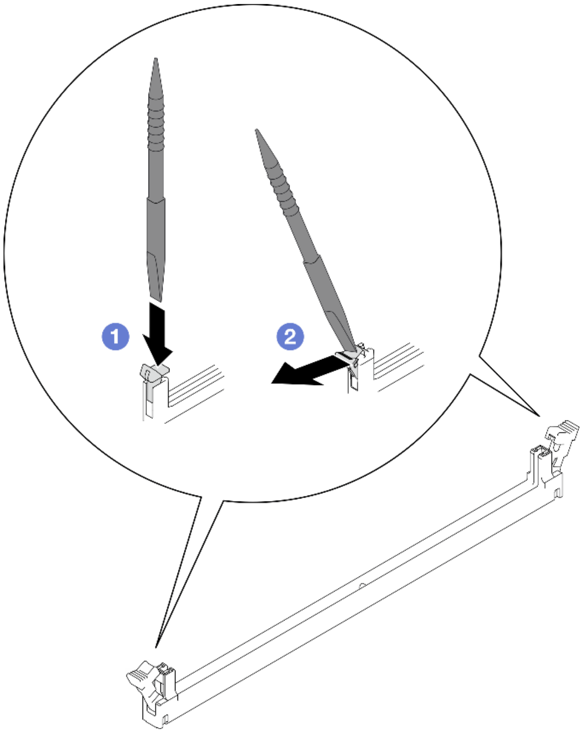


Figure 256. Pressing retaining clips on memory module connector

Attention:

- Memory modules are static-sensitive devices. The package must be grounded before it is opened.
- To avoid breaking the retaining clips or damaging the memory module connectors, open and close the clips gently.

Step 5. Hold the right end and left end of the memory module at the same time. Keep the memory module in parallel with the connector; then, carefully remove the memory module.

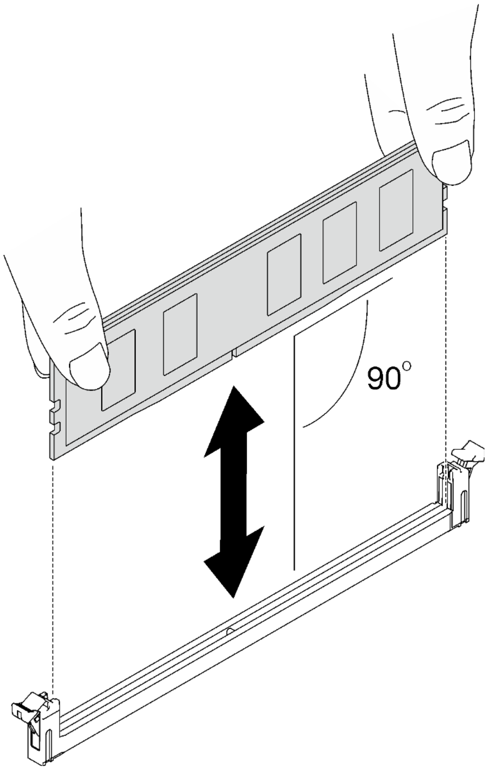
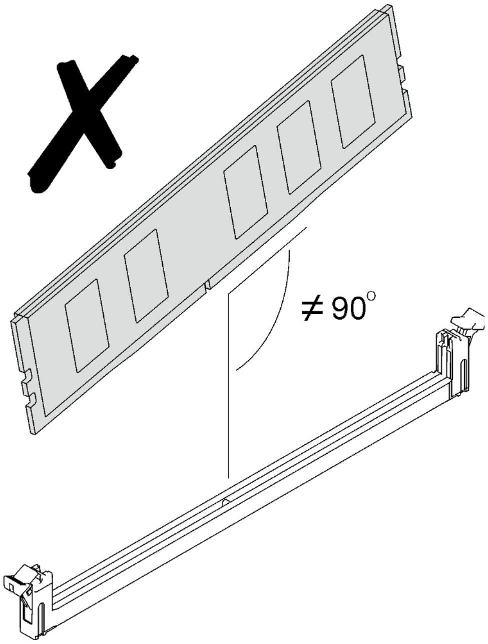


Figure 257. Memory module removal

Note: Memory module should be in horizontal position during removal.



Step 6. Install the DIMM cover.

Note: When installing the DIMM cover (1), the center of the DIMM cover should be aligned with the center of the DIMMs (2).

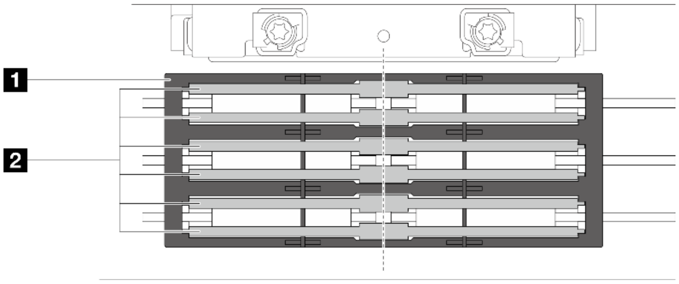


Figure 258. Aligning center of DIMM cover and DIMMs

Note: Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.

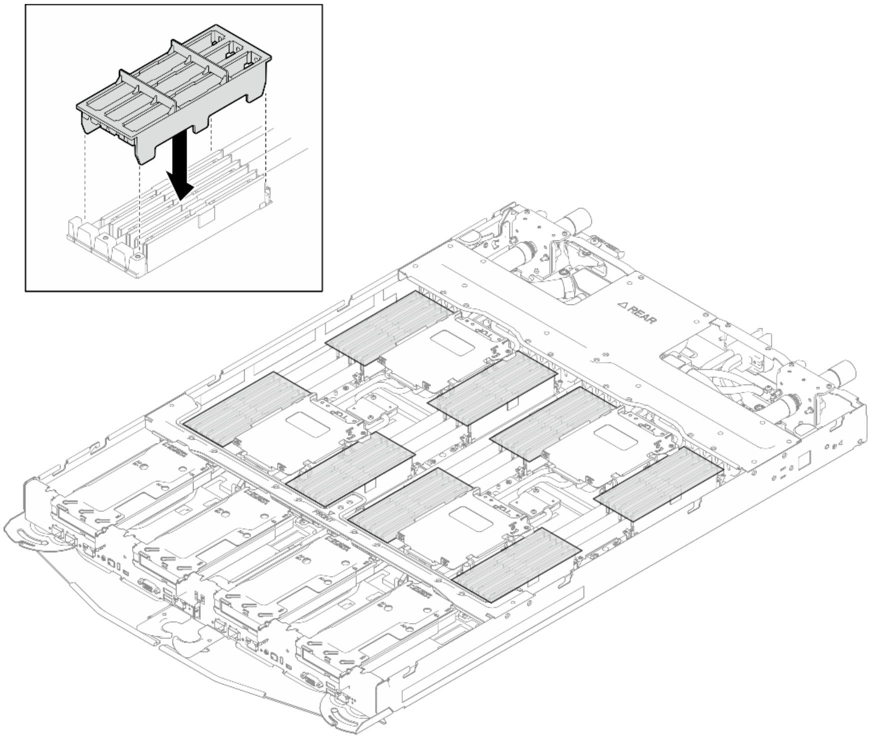


Figure 259. DIMM cover installation

Note: Check the side view of the DIMM slots and DIMM cover. Make sure the top of the DIMM cover is aligned with the top of the DIMMs. If the top of the DIMM cover is higher than the DIMMs, the DIMM cover is not correctly installed.

1 DIMM cover
2 DIMM

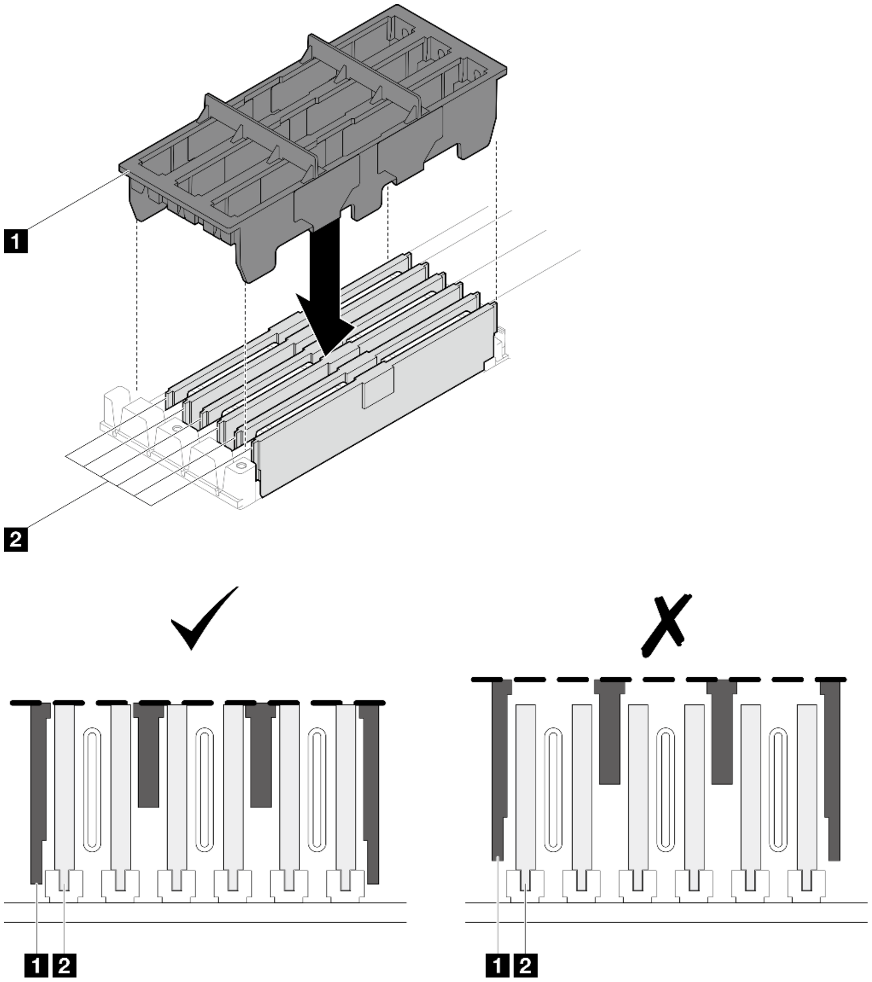


Figure 260. Check DIMM cover installation from DIMM slot side view

Step 7. Install the memory module tool to the DIMM comb.

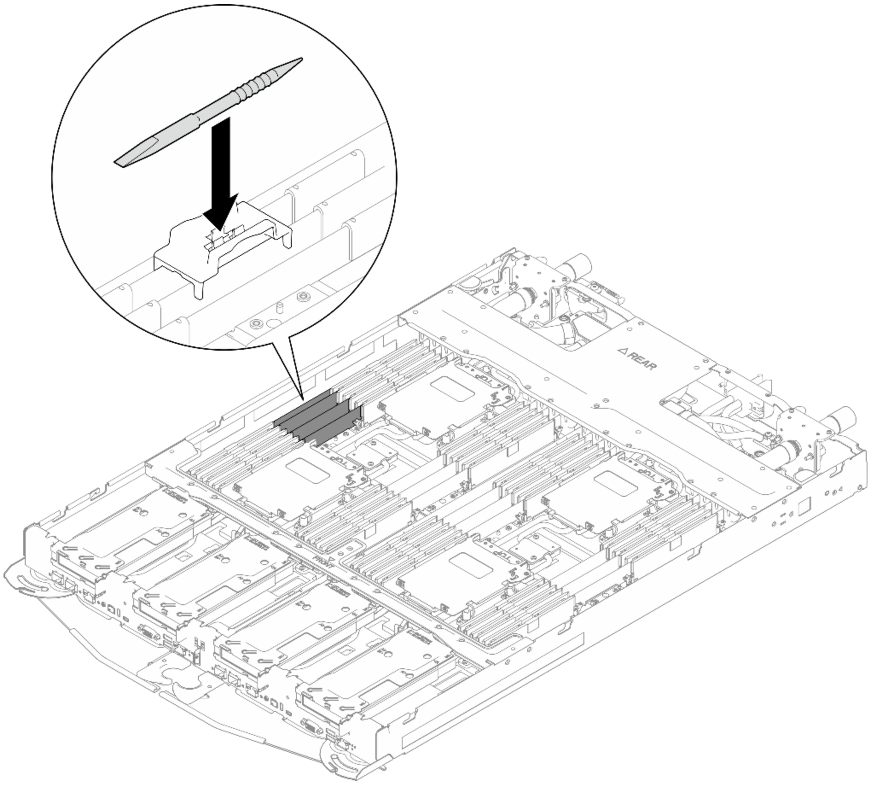


Figure 261. Memory module tool installation

After you finish

- Install a memory module, see:
  - "Install a memory module (single-side cooling) " on page 226, or
  - "Install a memory module (dual-side cooling) " on page 212
- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a memory module (single-side cooling)

Use this information to install a memory module that requires single-side cooling.

Important: 32GB, 64GB, and 96GB RDIMM require single-side cooling. (128GB RDIMM, 32GB MRDIMM, 64GB MRDIMM require dual-side cooling, refer to "Memory module (dual-side cooling) replacement" on page 203.)

About this task

See "Memory module installation rules and order" on page 36 for detailed information about memory configuration and setup.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

- Memory modules are sensitive to static discharge and require special handling. In addition to the standard guidelines for “Handling static-sensitive devices” on page 36:
  - Always wear an electrostatic-discharge strap when removing or installing memory modules. Electrostatic-discharge gloves can also be used.
  - Never hold two or more memory modules together so that they touch. Do not stack memory modules directly on top of each other during storage.
  - Never touch the gold memory module connector contacts or allow these contacts to touch the outside of the memory-module connector housing.
  - Handle memory modules with care: never bend, twist, or drop a memory module.
  - Do not use any metal tools (such as jigs or clamps) to handle the memory modules, because the rigid metals may damage the memory modules.
  - Do not insert memory modules while holding packages or passive components, which can cause package cracks or detachment of passive components by the high insertion force.
  - DIMM fillers must be installed in unused slots for proper cooling.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

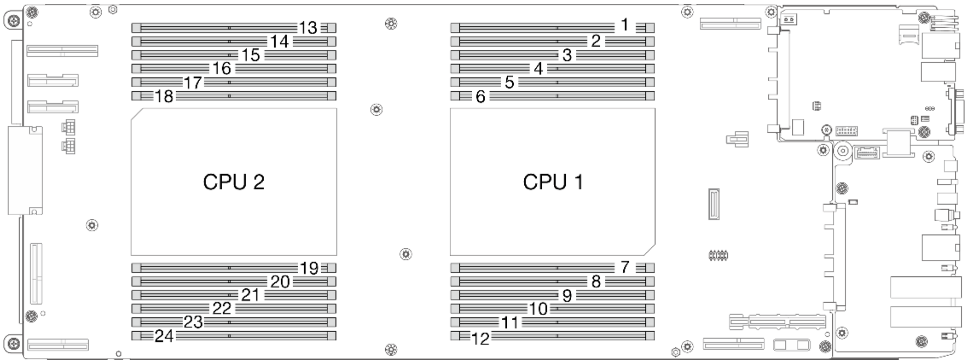


Figure 262. Processor socket and memory module connector location

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: Make sure to remove or install memory module 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity and safe for handling memory module.

Step 1. Memory module that requires single-side cooling is not compatible with DIMM cooling bars. Make sure there is no DIMM cooling bars installed in the tray. To remove DIMM cooling bar, see “Remove a DIMM cooling bar” on page 116.

Step 2. Remove the memory module tool attached to the DIMM comb.

Note: Memory module tool is recommended due to space limitations caused by location of water loop tubes through the memory section.

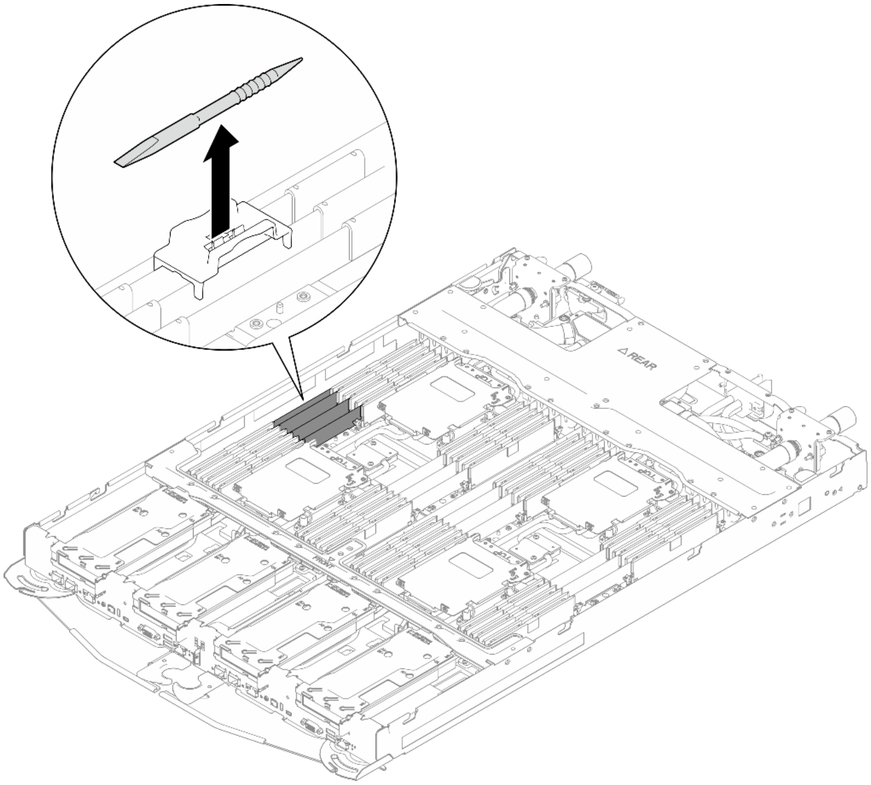


Figure 263. Memory module tool removal

Step 3. Remove the DIMM cover.

Note: Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.

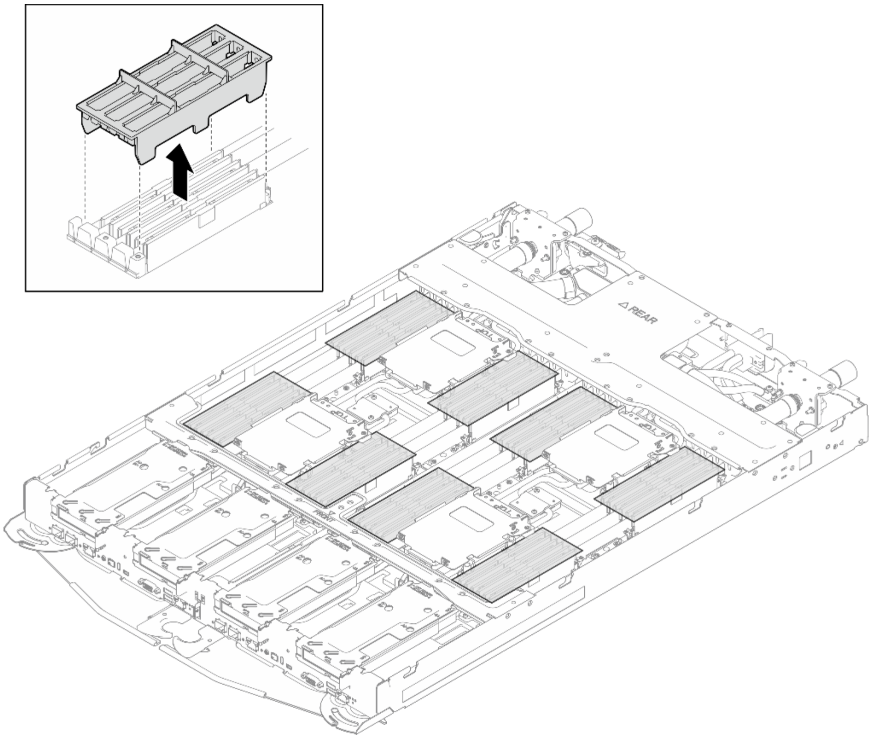


Figure 264. DIMM cover removal

Step 4. Unlock the retaining clips on each end of the memory module connector with the memory module tool.

a. ❶ Place the tip of the tool on the top of the retaining clip.

b. ❷ Press the tool to rotate and unlock the retaining clip.

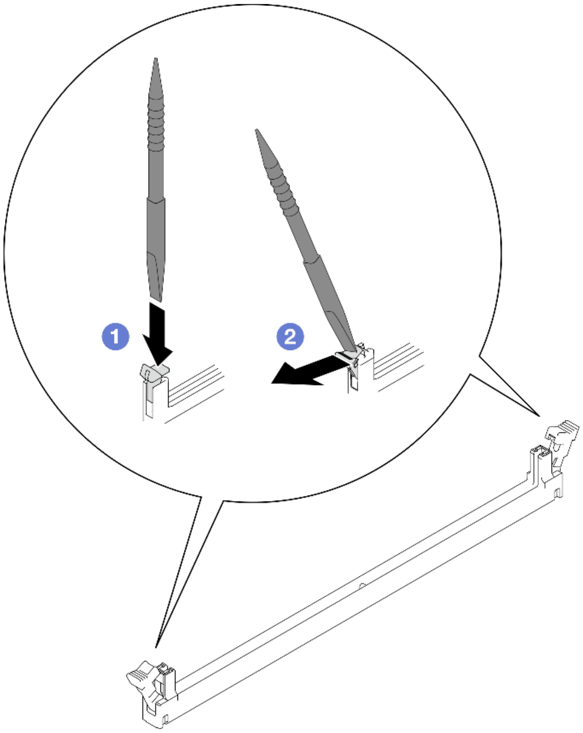


Figure 265. Pressing retaining clips on memory module connector

Attention:

- Memory modules are static-sensitive devices. The package must be grounded before it is opened.
- To avoid breaking the retaining clips or damaging the memory module connectors, open and close the clips gently.

Step 5. Touch the static-protective package that contains the memory module to any unpainted metal surface on the outside of the node; then, remove the memory module from the package.

Step 6. Align the memory module with the slot, and gently place the memory module on the slot with both hands.

Step 7. Install the memory module.

a. Hold the right end and left end of the memory module at the same time and keep it in parallel with the connector.

b. Align the memory module with the connector while gently placing it onto the connector. Then, firmly press both ends of the memory module straight down into the connector until the retaining clips snap into the locked position.

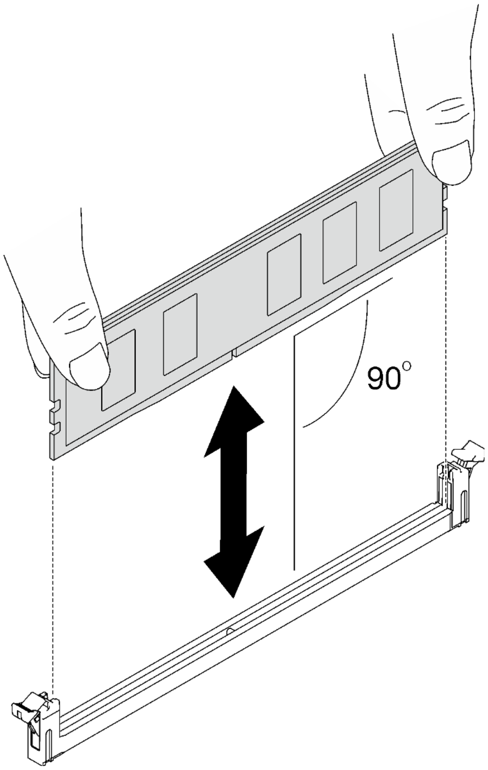
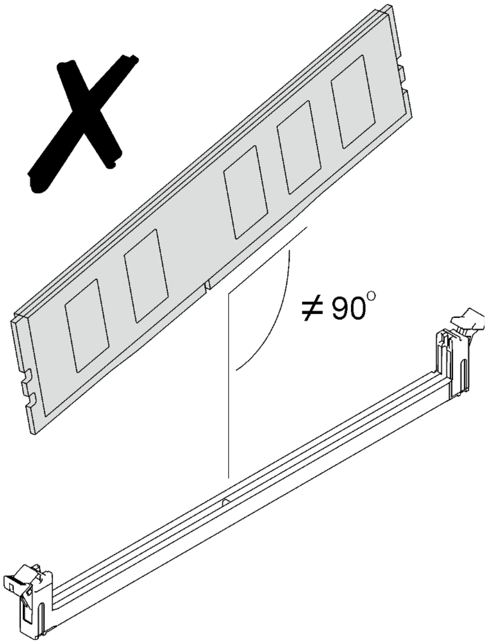


Figure 266. Memory module installation

Note: Memory module should be in horizontal position during installation.



Step 8. Make sure the retaining clips are properly locked. If the retaining clips are open, firmly press right and left ends of the memory module until the clips are locked.

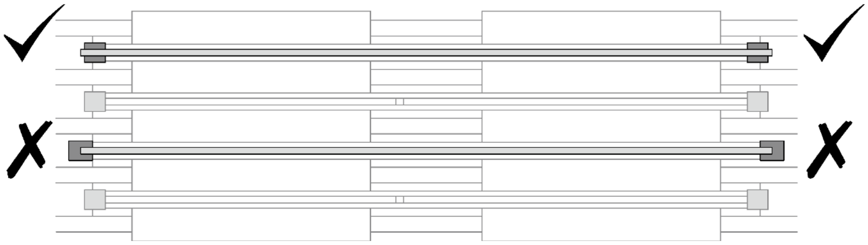


Figure 267. Open and locked retaining clips on memory module connector

Step 9. Install the DIMM cover.

Note: When installing the DIMM cover (**1**), the center of the DIMM cover should be aligned with the center of the DIMMs (**2**).

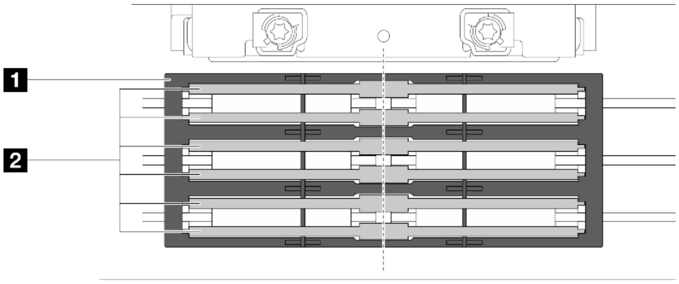


Figure 268. Aligning center of DIMM cover and DIMMs

Note: Do not tilt the DIMM cover and keep it at an upright position to prevent damaging the gap pads.

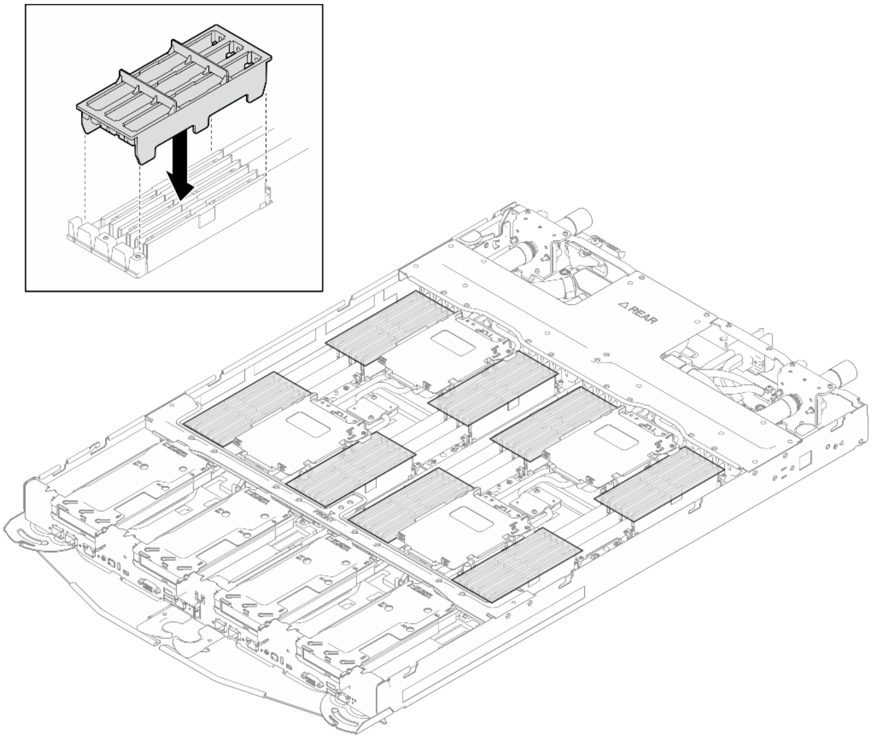


Figure 269. DIMM cover installation

Note: Check the side view of the DIMM slots and DIMM cover. Make sure the top of the DIMM cover is aligned with the top of the DIMMs. If the top of the DIMM cover is higher than the DIMMs, the DIMM cover is not correctly installed.

1 DIMM cover
2 DIMM

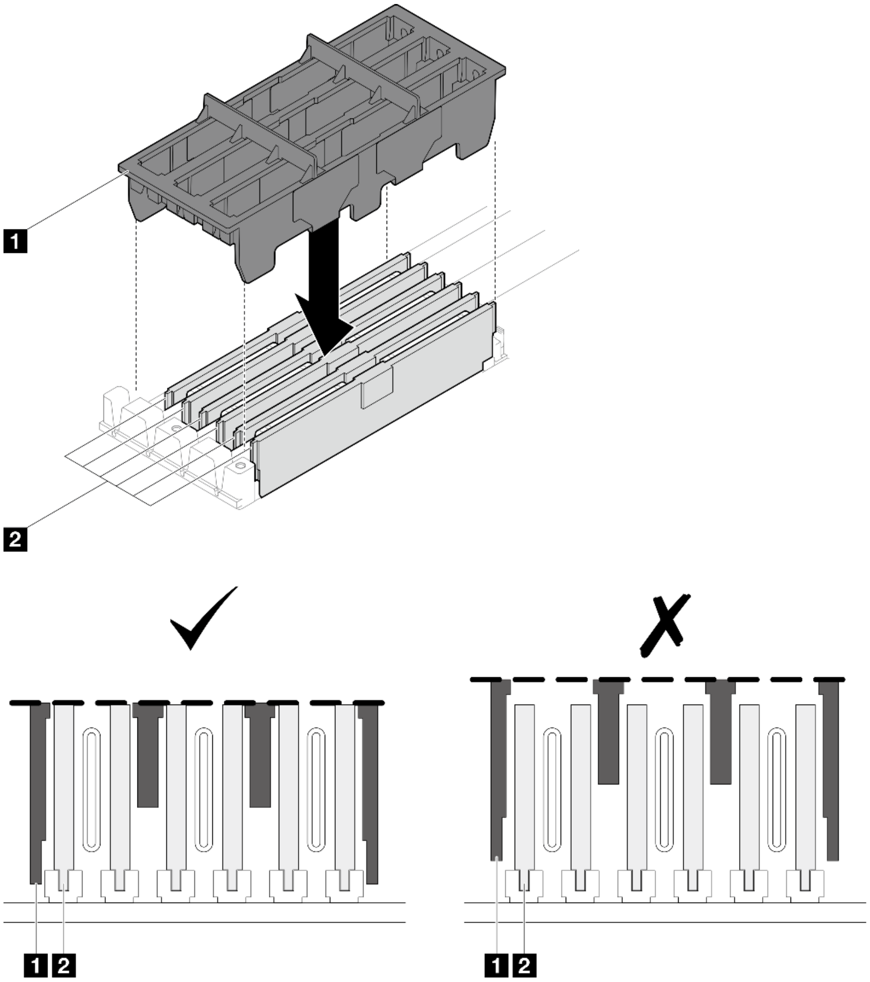


Figure 270. Check DIMM cover installation from DIMM slot side view

Step 10. Install the memory module tool to the DIMM comb.

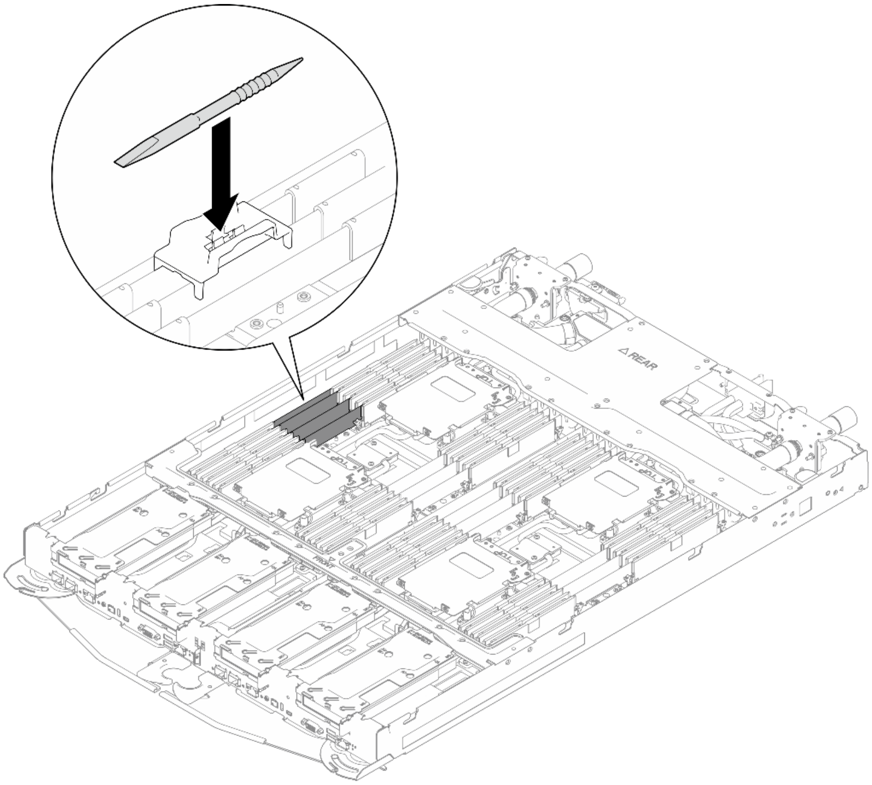


Figure 271. Memory module tool installation

After you finish

1. Install the tray cover. See "Install the tray cover" on page 373.
2. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
3. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

4. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

OPA 400 adapter riser assembly replacement

Use the following procedures to remove and install an OPA 400 adapter riser assembly.

Remove an OPA 400 adapter riser assembly

Use this information to remove an OPA 400 adapter riser assembly.

About this task

Required tools

- Screwdriver for T10 and PH1 screws
- Waterloop Miscellaneous Kit (SC750 V4) .
- OPA 400 Gap Pad

- OPA 400 Conduction Plate (if installing OPA 400 for the first time)
- The system supports two types of riser cages, **1** with A/B printing and **2** with A/B/C/D printing, as shown in the illustration below. Make sure to use riser cage **2** when installing the **OPA 400**.

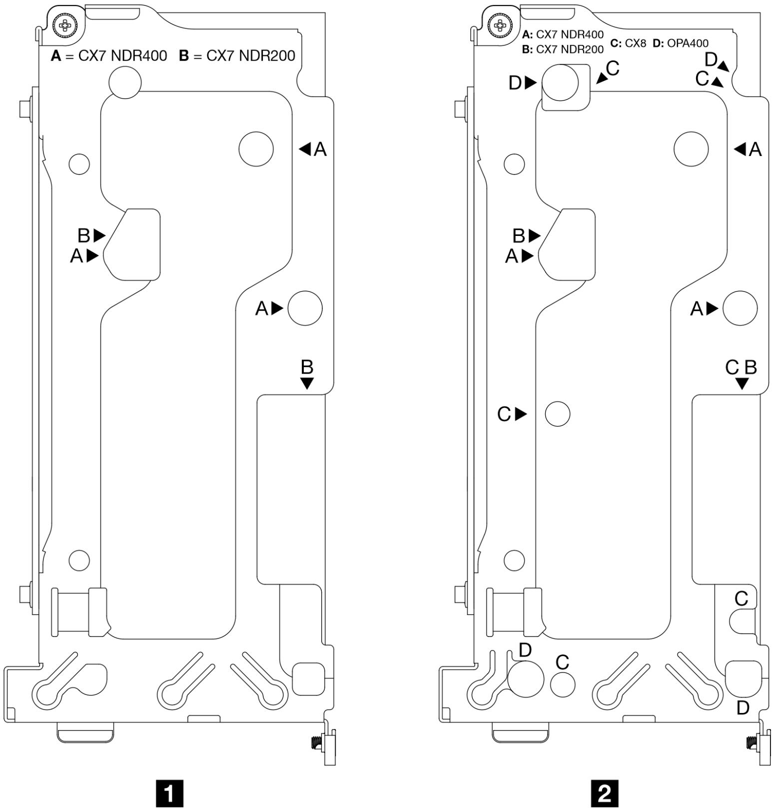


Figure 272. Riser cage types

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. Remove the cross braces. See "Remove the cross braces" on page 108.

d. For shared I/O or socket direct configurations, disconnect the cable from the system board. See ***Internal Cable Routing Guide***.

Step 2. Loosen the OPA 400 riser assembly from the water loop.

a. ❶ Loosen the captive screw on the riser assembly.

b. ❷ Remove four T10 screws from the screw holes marked with **D** on the riser cage.

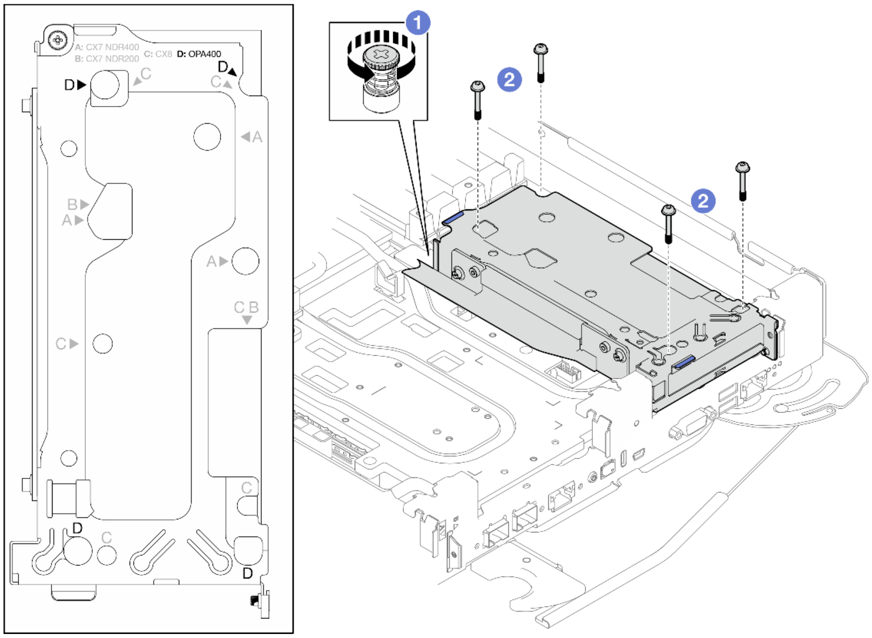


Figure 273. Loosening the OPA 400 riser assembly

Step 3. Carefully grasp the riser assembly by its edges and remove it out of the node.

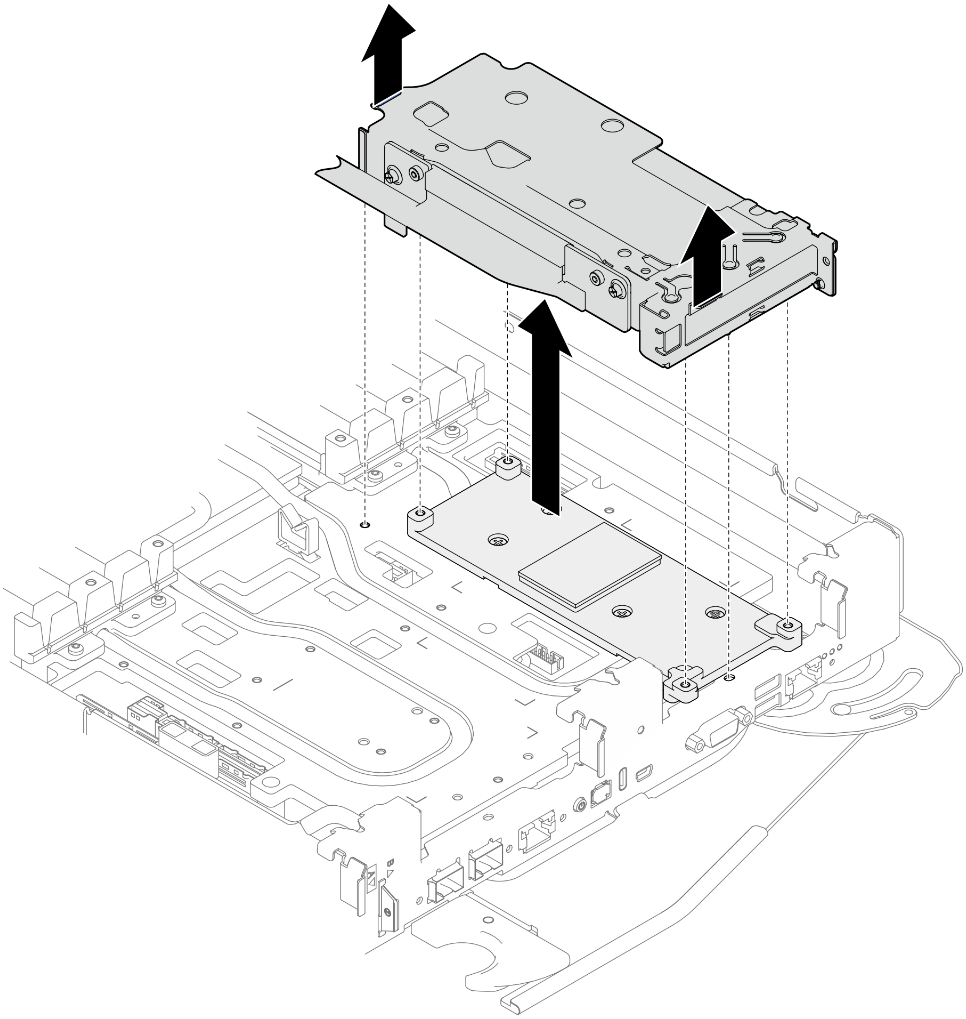


Figure 274. Removing OPA 400 assembly removal

Step 4. If necessary, remove the interface plate.

a. Remove the four PH1 screws from the interface plate.

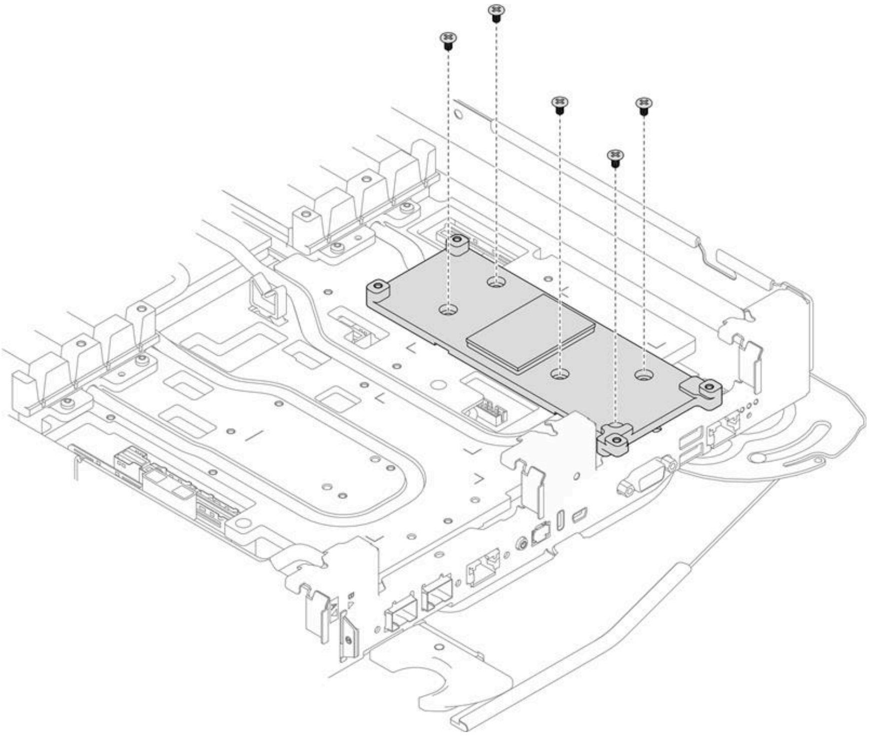


Figure 275. Removing OPA 400 riser assembly interface plate

b. Release the interface plate with a flat head screwdriver.

  1. There are openings (marked with black triangle in the illustration below) on the bottom side of the interface plate for inserting a flat head screwdriver—select the one that is accessible for the flat head screwdriver.
  2. Insert a flat head screwdriver into the opening; then, slightly rotate the screwdriver to release the interface plate from the water loop cold plate.

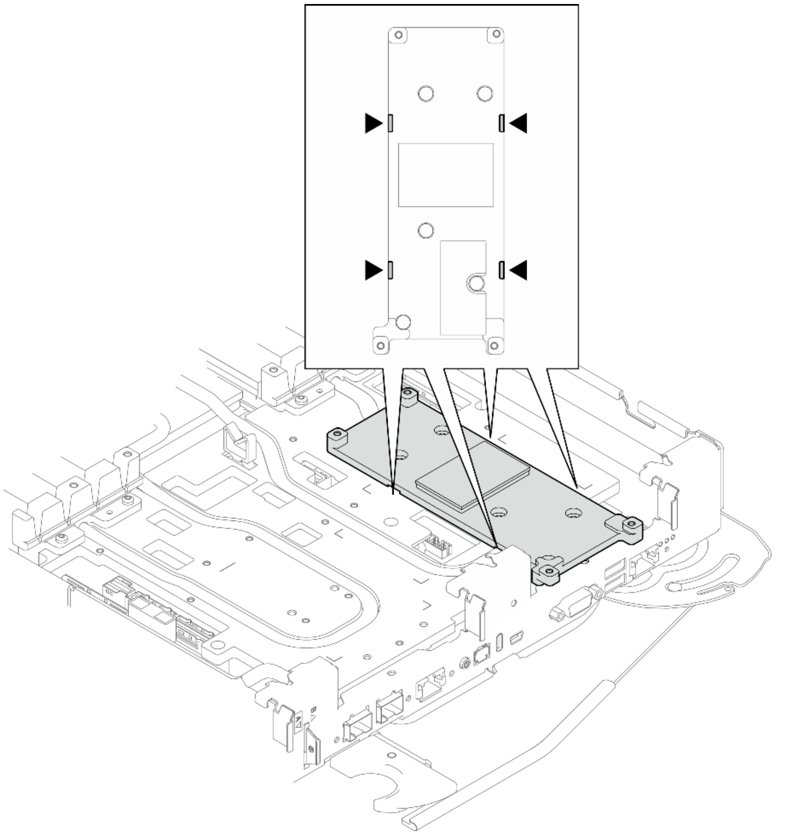


Figure 276. Locations of openings on the bottom side of the OPA 400 riser assembly interface plate

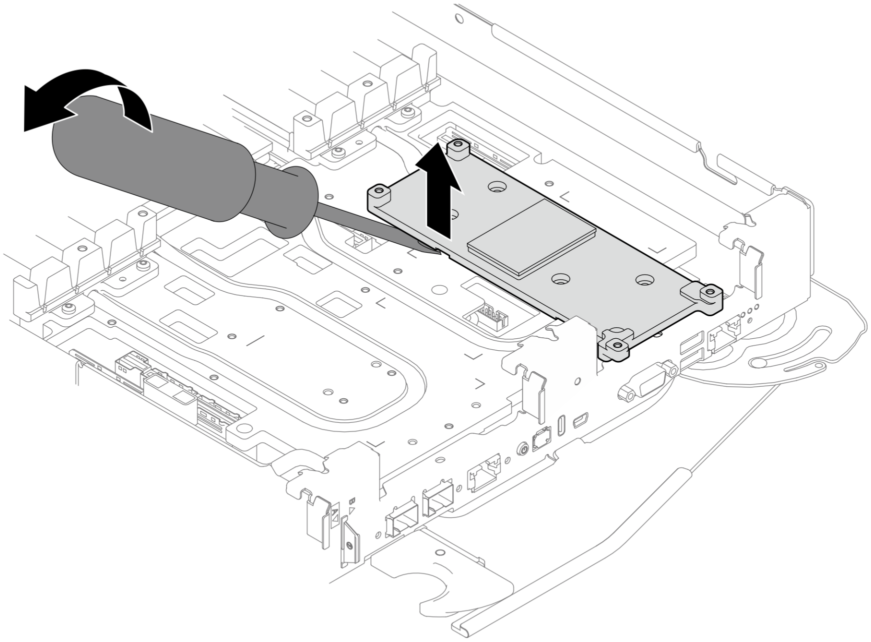


Figure 277. Releasing the interface plate from water loop cold plate

c. Remove the interface plate from the tray.

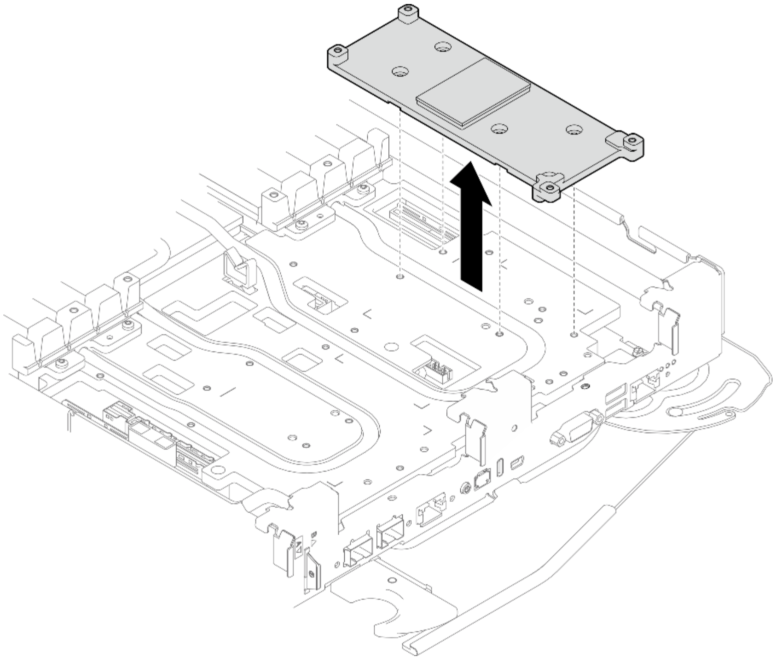


Figure 278. Removing the interface plate

Step 5. If no riser cage or drive cage is to be installed, install the blank bezel filler.

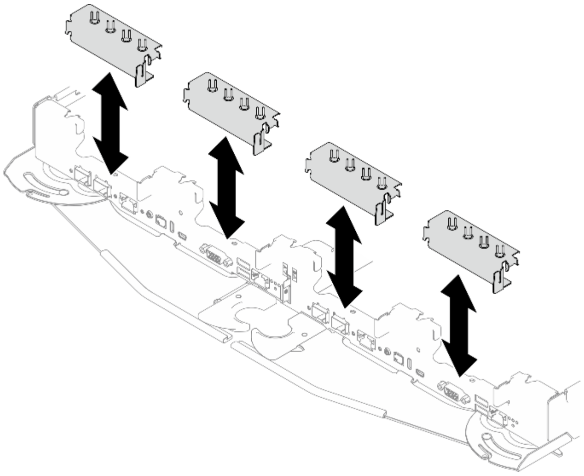


Figure 279. Installing blank bezel filler

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install an OPA 400 adapter riser assembly

Use this information to install an OPA 400 adapter riser assembly.

About this task

Required tools

- Screwdriver for T10 and PH1 screws
- Waterloop Miscellaneous Kit (SC750 V4) .
- OPA 400 Gap Pad
- OPA 400 Conduction Plate (if installing OPA 400 for the first time)
- The system supports two types of riser cages, **1** with A/B printing and **2** with A/B/C/D printing, as shown in the illustration below. Make sure to use riser cage **2** when installing the **OPA 400**.

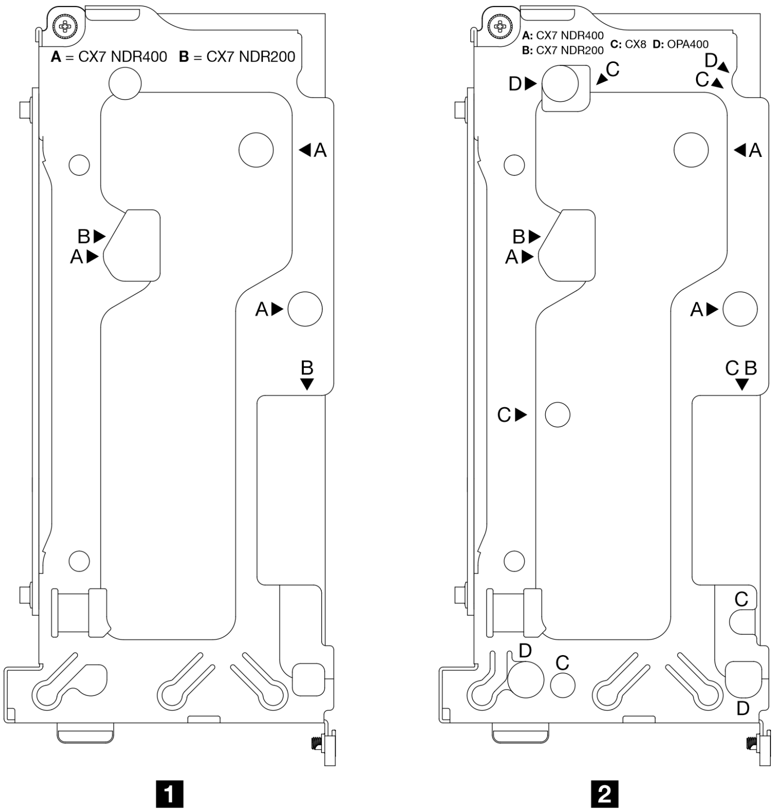


Figure 280. Riser cage types

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see “Gap pad identification and location” on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. PCIe riser assembly installation rule is different for each PCIe configurations: standalone, socket direct, and shared I/O. When selecting riser slot to install a PCIe riser assembly, make sure to reference the rules specified in "Front drive and PCIe adapter configuration" on page 21.

Step 2. Make sure to install correct type of PCIe riser cage to the corresponding riser slot.

Note: The type of PCIe riser cage installed in slot 1 and slot 2 are different. See the illustration below for proper PCIe riser cage installation.

Riser cage type	**Slot numbering**
1 Riser cage with cabled riser	**PCIe slot 2**
2 Standard riser cage	**PCIe Slot 1**

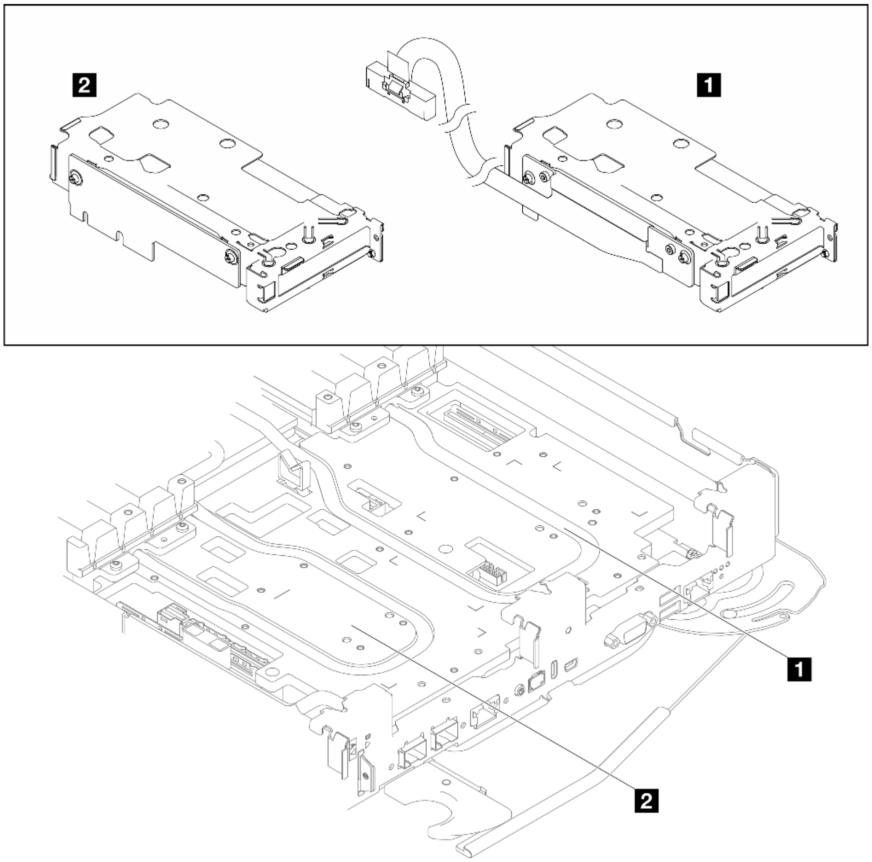


Figure 281. PCIe riser cage types for slot 1 and slot 2

Step 3. Remove the blank bezel fillers if they are installed.

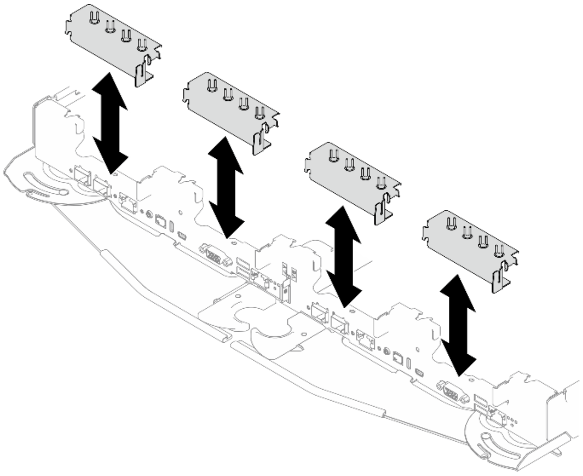


Figure 282. Removing blank bezel filler

Step 4. If the interface plate was removed, install the interface plate to the water loop.

a. Align the interface plate with the two guide pins on the water loop (marked with circles in the illustration below).

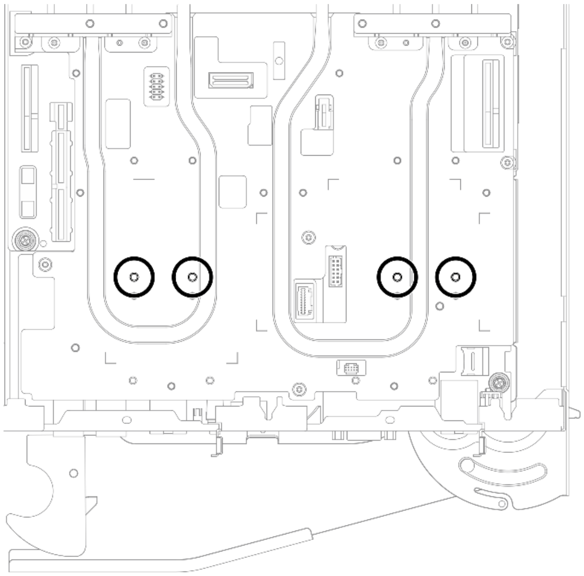


Figure 283. Guide pins for PCIe adapter interface plate

b. Place the interface plate on the water loop; then, install four PH1 screws.

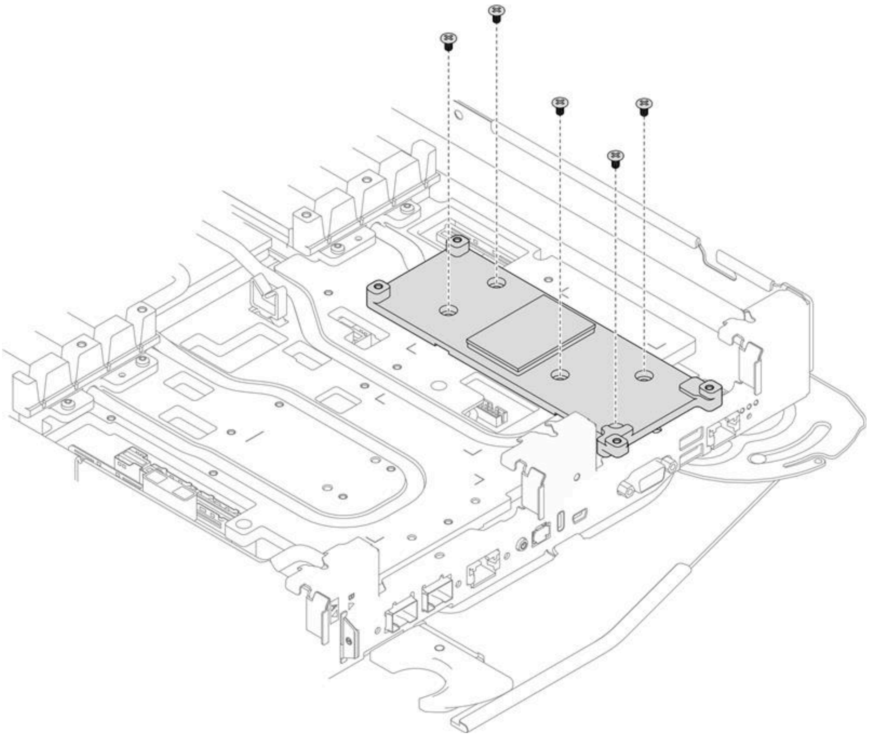


Figure 284. OPA 400 riser assembly interface plate installation

Step 5. Replace the single-use gap pad on the interface plate with a new one. Make sure to follow Gap pad/putty pad replacement guidelines.

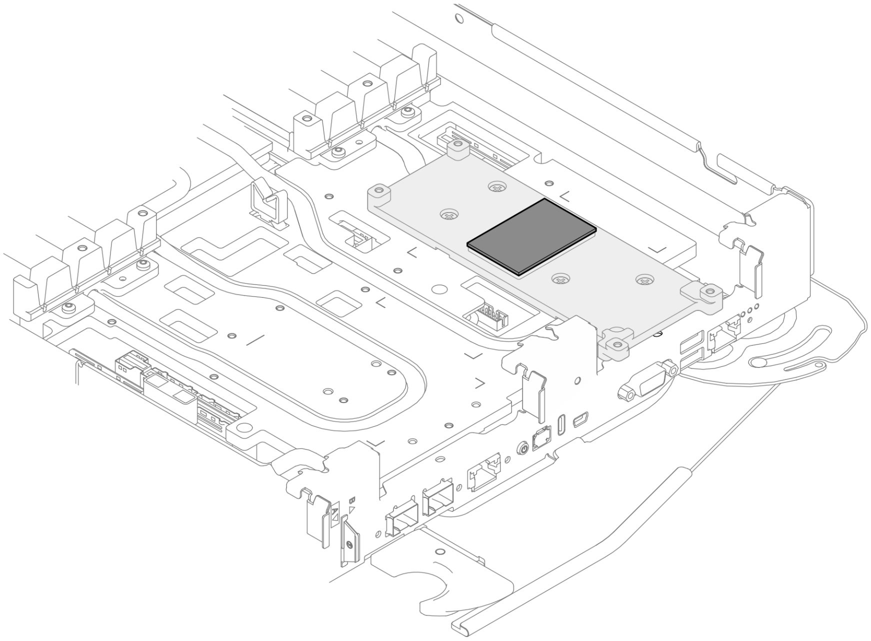


Figure 285. OPA 400 riser assembly interface plate single-use gap pad

Step 6. Install the OPA 400 riser assembly.

a. ❶ Install the OPA 400 riser assembly to the water loop.

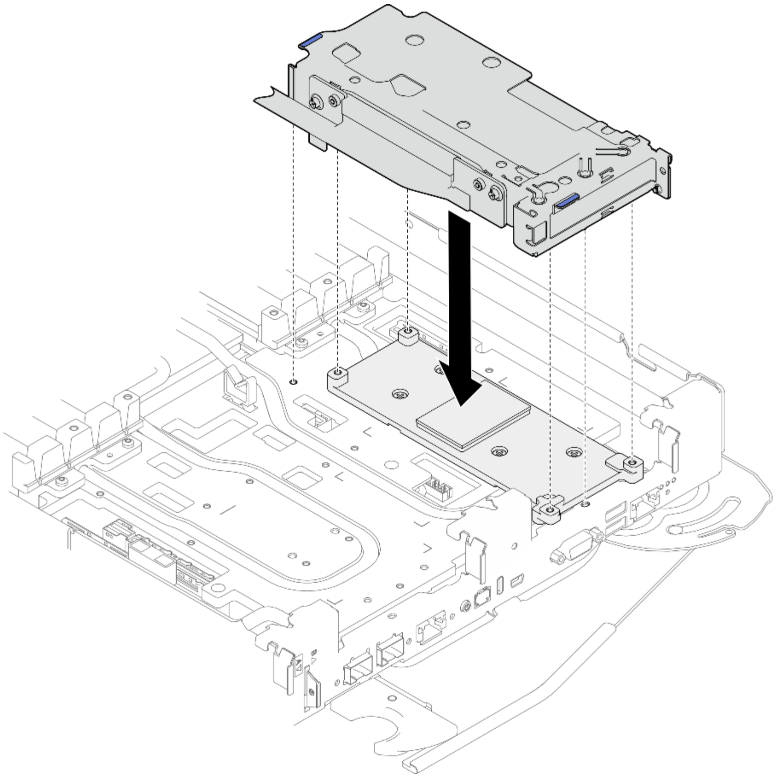


Figure 286. Installing the OPA 400 riser assembly

b. ② Follow the screw installation sequence shown in the illustration below, and install four T10 screws to screw holes marked with **D** on the riser cage.

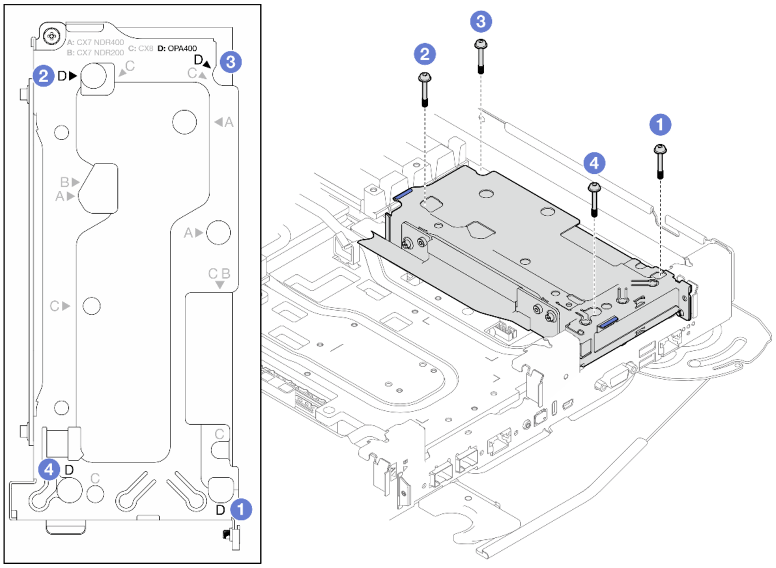


Figure 287. Installing screws to secure the OPA 400 riser assembly

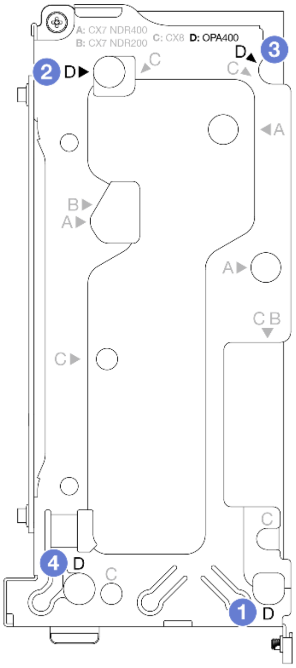


Figure 288. OPA 400 screw hole identification and sequence

c. ③ Fasten the captive screw to secure the riser assembly to the water loop.

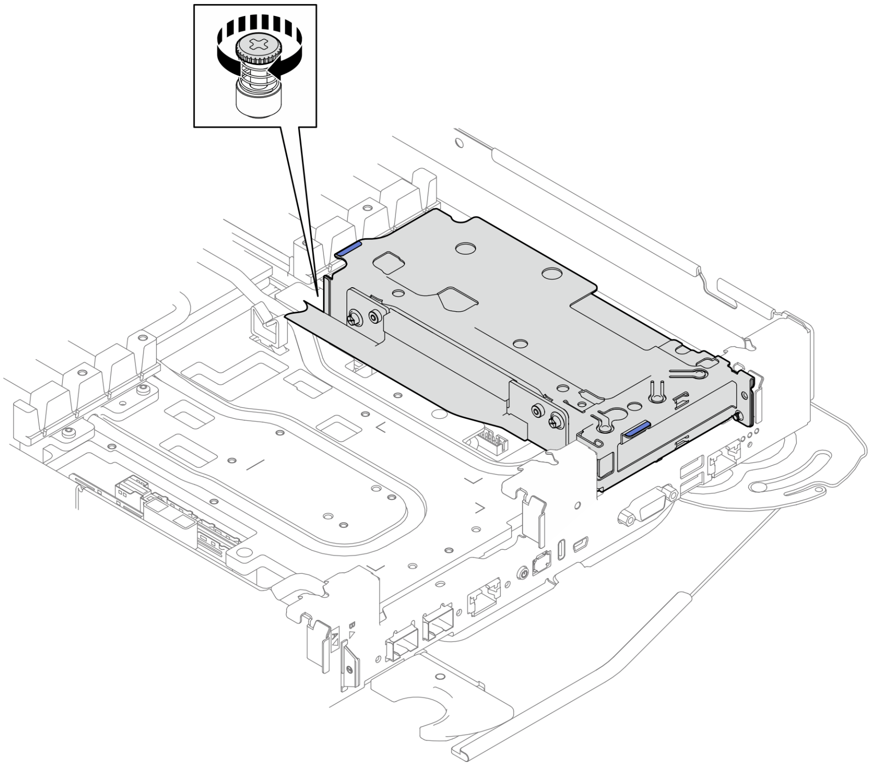


Figure 289. Installing OPA 400 riser assembly

After you finish

1. Connect the PCIe adapter cables to the system board. See ***Internal Cable Routing Guide***.

2. Install the cross braces. See “Install the cross braces” on page 109.
3. Install the tray cover. See “Install the tray cover” on page 373.
4. Install the tray into the enclosure. See “Install a tray in the enclosure” on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see “PCIe adapter cable routing” in *SC750 V4 Cable Routing Guide*.

PCIe adapter replacement

Use the following procedures to remove and install a PCIe adapter from and to a riser cage.

Remove a PCIe adapter from a riser cage

Use this information to remove a PCIe adapter from a riser cage.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- The following illustration might differ slightly from your hardware, but the removal method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

   a. Remove the tray from the enclosure. See “Remove a tray from the enclosure” on page 332.

   b. Remove the tray cover. See “Remove the tray cover” on page 372.

   c. Remove the cross braces. See “Remove the cross braces” on page 108.

   d. Remove the PCIe adapter riser assembly. See “Remove a ConnectX-7 NDR 200 adapter riser assembly” on page 71 or “Remove a ConnectX-7 NDR 400 adapter riser assembly” on page 83.

Step 2. Remove the PCIe adapter from the riser cage.

   a. ① Remove the PH1 screw the secures the PCIe adapter to the riser cage.

   b. ② Remove the PCIe adapter from the riser cage.

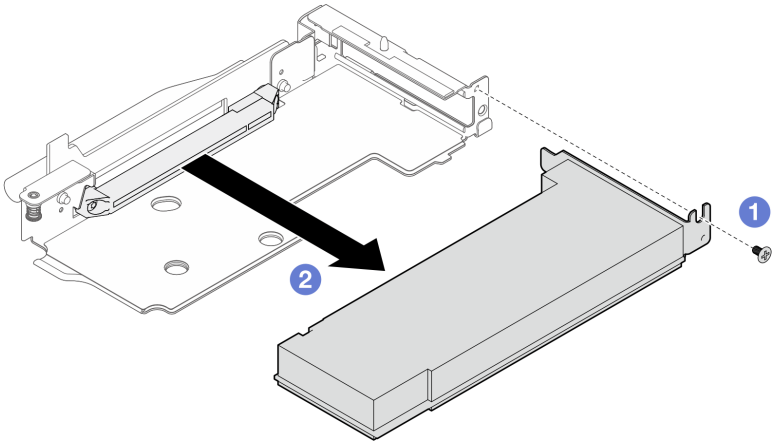


Figure 290. PCIe adapter removal

Step 3. For shared I/O or socket direct configurations, disconnect the cable.

a. ① Carefully pull the two latches outward.

b. ② Open the bottom cable clip cover.

c. ③ Remove the cable clip away from the connectors.

d. ④ Gently grasp and pull the black plastic sheets outward.

e. ⑤ Pull the cable connectors out of the adapter.

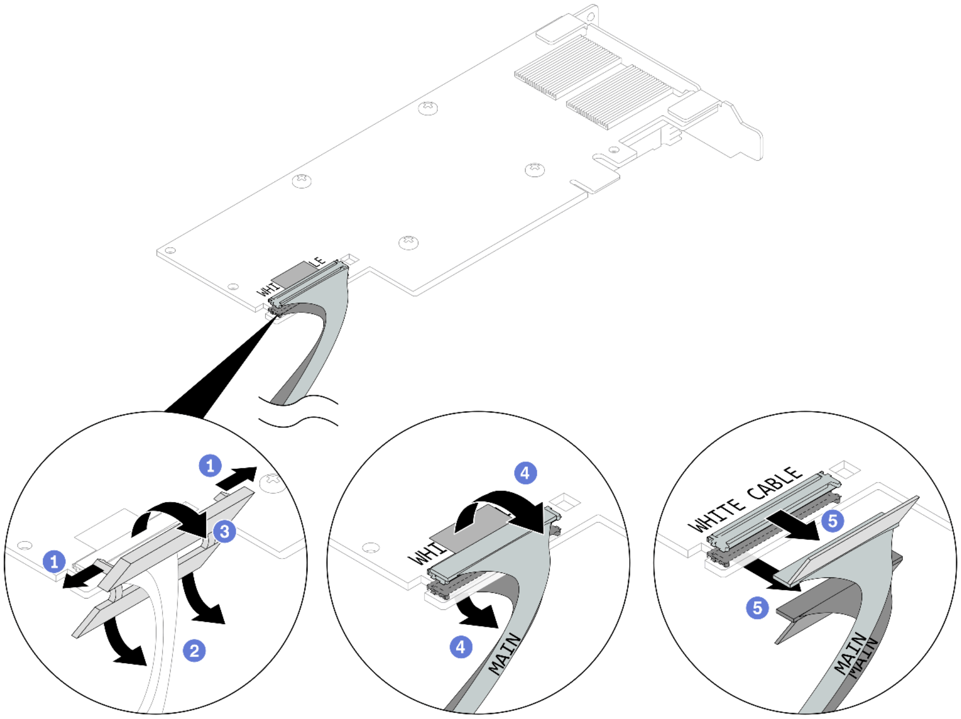


Figure 291. PCIe adapter cable removal

Step 4. If necessary, install a filler into the PCIe riser-cage and secure it with a PH1 screw.

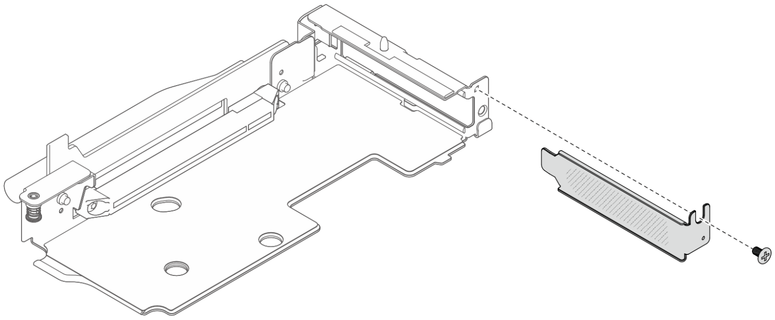


Figure 292. Filler installation

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a PCIe adapter to a riser cage

Use this information to install a PCIe adapter to a riser cage.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. If a filler is installed, remove the PH1 screw and remove the filler out of the PCIe riser-cage.

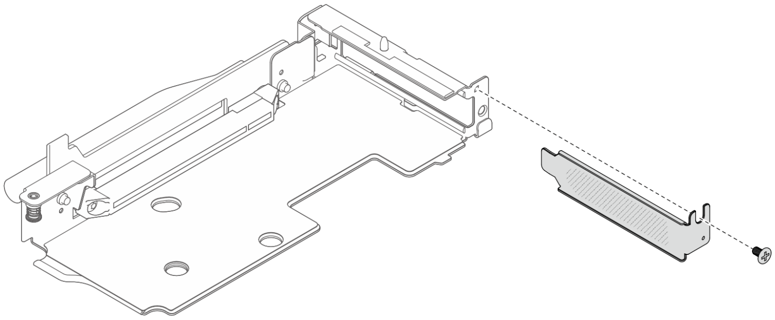


Figure 293. Filler removal

Step 2. **(ONLY for ConnectX-7 200 or ConnectX-7 200)** For shared I/O or socket direct configurations, connect the cable.

a. ① Gently push the connectors into the slots.

b. ② Close the cable covers and slightly press the cable covers until they click into place.

c. ③ Insert the two latches into the slots next to the connectors.

d. ④ Close the cable clip covers and slightly press them to secure the connectors.

Attention:

- There are **WHITE CABLE** and **BLACK CABLE** callouts on the adapter, connect the cables to the connectors according to the cable colors.
- There are **MAIN** and **AUX** labels on cables, connect **MAIN** ends to the main adapter and connect **AUX** ends to the auxiliary adapter.

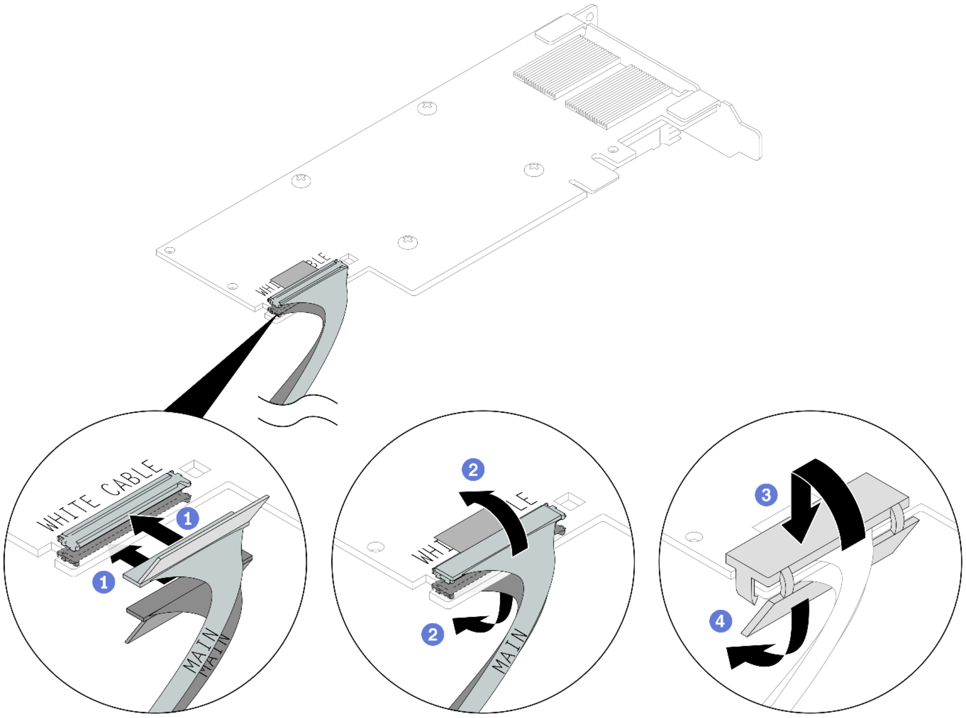


Figure 294. ConnectX-7 200 or ConnectX-7 200 PCIe cable installation

Step 3. Install the PCIe adapter to the riser cage.

a. ① Align the adapter with the PCIe slot on the riser-cage. Carefully press the adapter straight into the slot until it is securely seated.

b. ② Fasten the PH1 screw to secure the adapter.

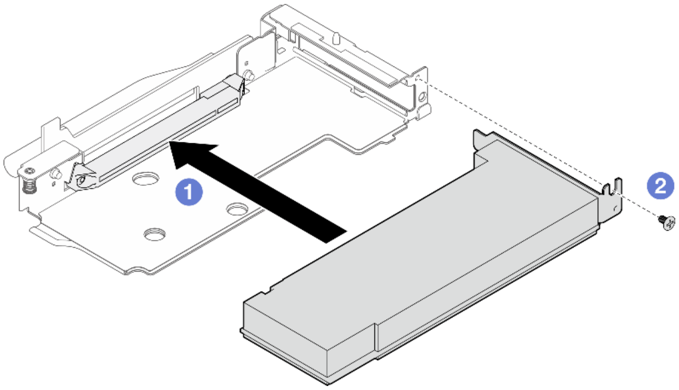


Figure 295. Installing PCIe adapter

After you finish

1. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
2. Install the cross braces. See "Install the cross braces" on page 109.
3. Install the tray cover. See "Install the tray cover" on page 373.
4. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
5. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
6. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Power distribution board replacement (trained technician only)

Use the following procedures to remove and install the power distribution board.

Remove the power distribution board

Use this information to remove the power distribution board.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- The following illustration might differ slightly from your hardware, but the removal method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

d. Remove the memory module, perform one of the following.
  - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
  - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

j. Remove the sideband cable kit. See "Remove the system management sideband cable kit" on page 327.

k. Remove the leakage sensor module. See "Remove the leakage sensor" on page 197.

Step 2. Remove the water loop from the tray. See "Remove the water loop" on page 375.

Step 3. Unfasten three PH1 captive screws on the power distribution board tray (PDB tray).

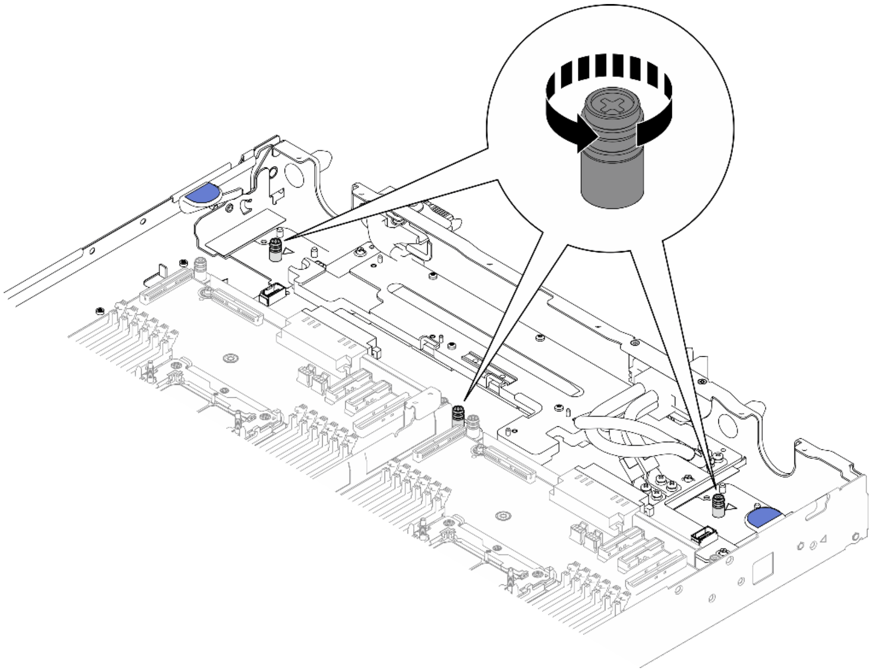


Figure 296. Unfasten three captive screws

Step 4. Remove two PH1 screws from the sides of the tray.

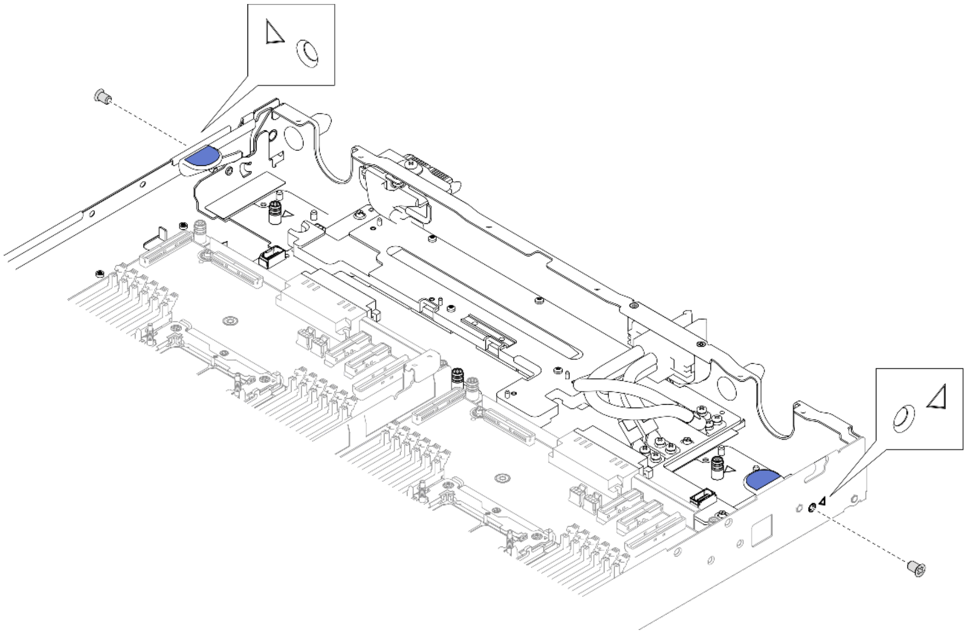
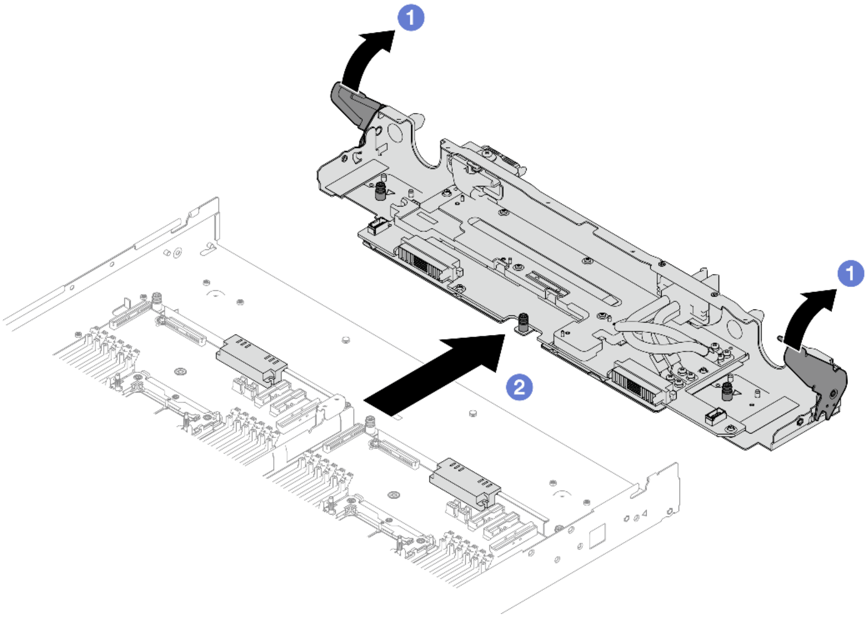


Figure 297. Removing screws from outside of the tray.

Step 5. Remove the power distribution board tray (PDB tray) from the server tray.

a. ❶ Rotate the tray handles to unlock position.

b. ❷ Remove the PDB tray from the server tray.



Step 6. Remove the bus bar connector module.

a. ❶ Remove four PH2 screws from ground cables (black cables), with a torque screwdriver set to the proper torque.

b. ② Remove four PH2 screws from power cables (red cables), with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 7+/-1.0 lbf-in.

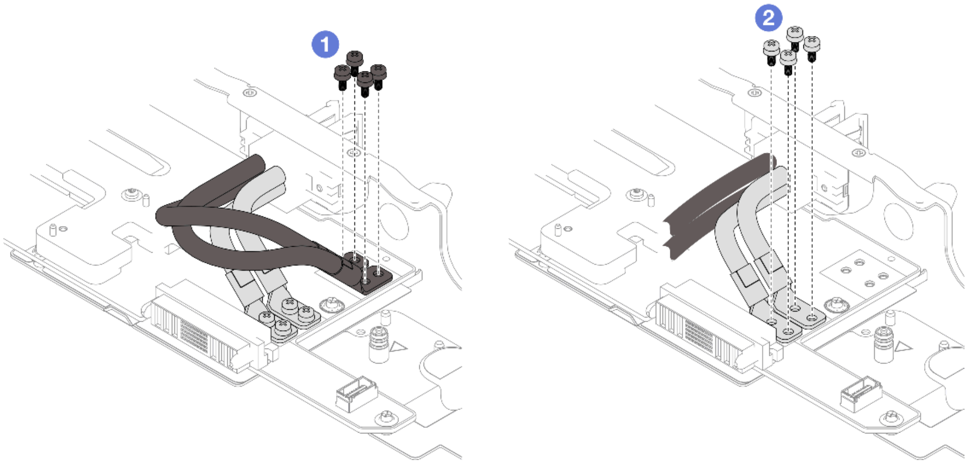


Figure 298. Disconnecting the bus bar connector module

c. ③ Remove threw PH1 screws from the tray rear bezel.

d. ④ Remove the bus bar connector module.

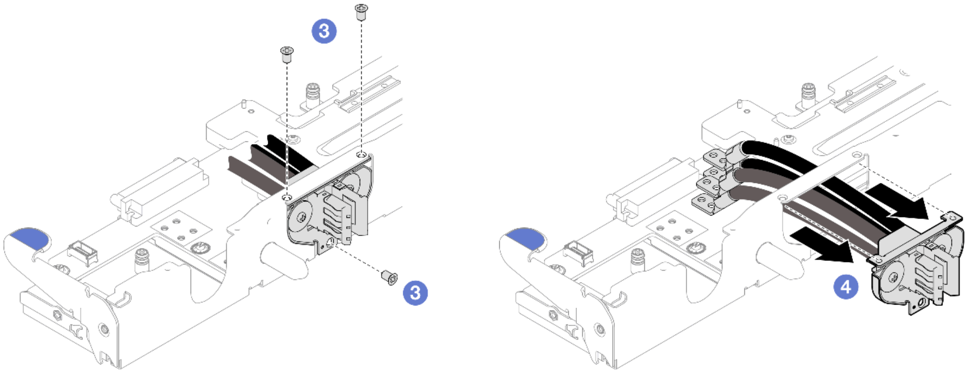


Figure 299. Removing the bus bar connector module

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the power distribution board

Use this information to install the power distribution board.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, and T30 screws

- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make sure two system boards are installed in the tray. See "Install the processor board" on page 289.

Step 2. Install the bus bar connector module.

a. ① Install the bus bar connector module to the tray rear bezel.

b. ② Install three PH1 screws on the rear tray bezel.

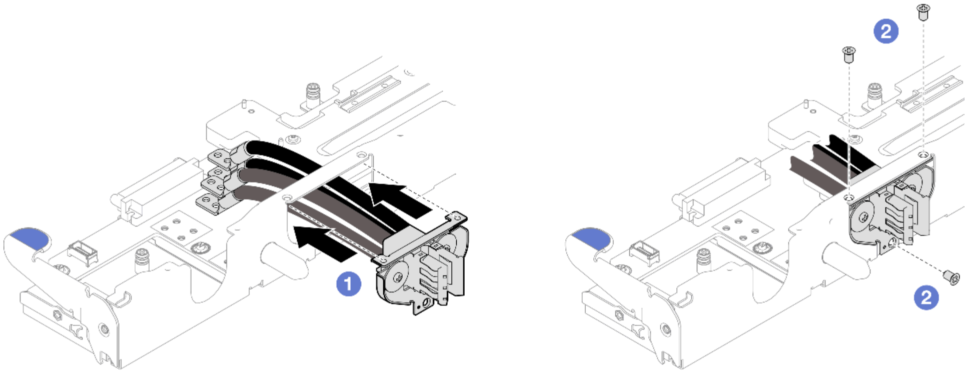


Figure 300. Installing the bus bar connector module

c. ③ Take the cables labeled as **PWR** and connect them to the power pad marked as **PWR**. Install four PH2 screws to secure the cables to the PIB, with a torque screwdriver set to the proper torque.

d. ④ Take the cables labeled as **GND** and connect them to the ground pad marked as **GND**. Install four PH2 screws to secure the cables to the PIB, with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 7+/- 1.0 lbf-in.

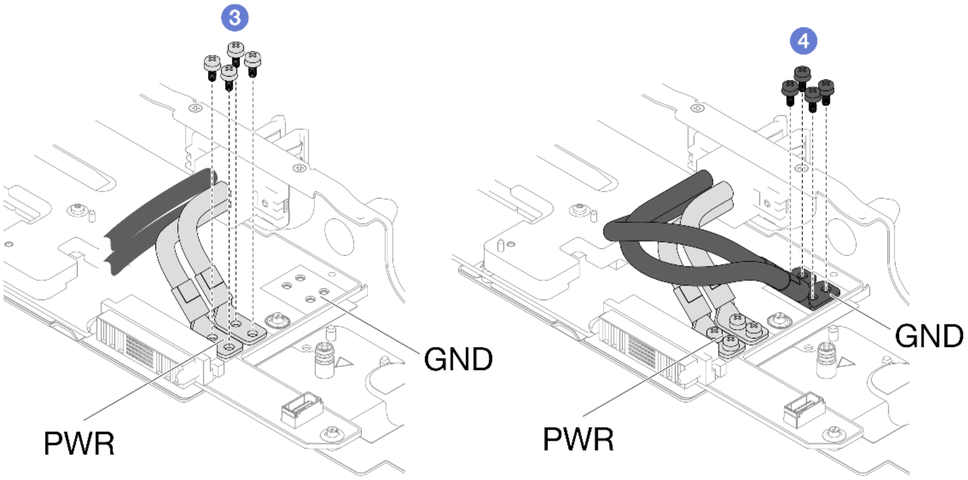


Figure 301. Connecting the bus bar connector module

Step 3. Place one **GND** cable under the water loop tube, the other **GND** cable between the tube and the **PWR** cables, as the illustration below.

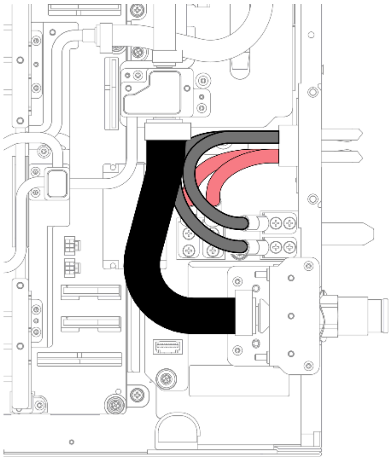


Figure 302. GND cable arrangement

Step 4. Make sure the PDB tray handles are rotate to unlock position.

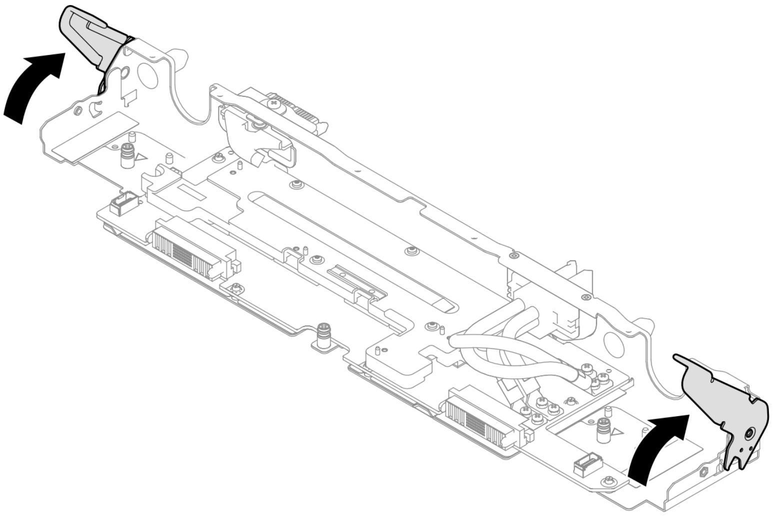


Figure 303. PDB tray handle unlock position

Step 5. Install the PDB tray.

a. ① Align the power connectors on PDB tray to the power connectors to the system boards.

b. ② There are triangle markings on the inside of the right-side and left-side of the tray. Push the PDB tray into the server tray. Stop pushing when the PDB tray meets the triangle markings.

c. ③ Rotate both PDB tray handles **at the same time** to the lock position

Attention: Make sure to rotate both handles at the same time.

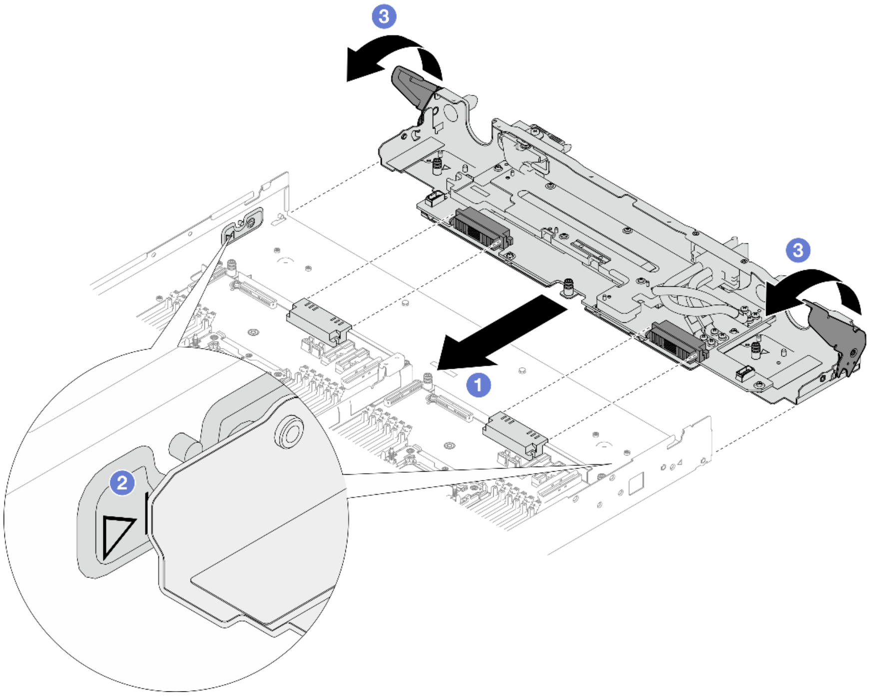


Figure 304. Installing the PDB tray

Step 6. Install two PH1 screws from the outside of the tray.

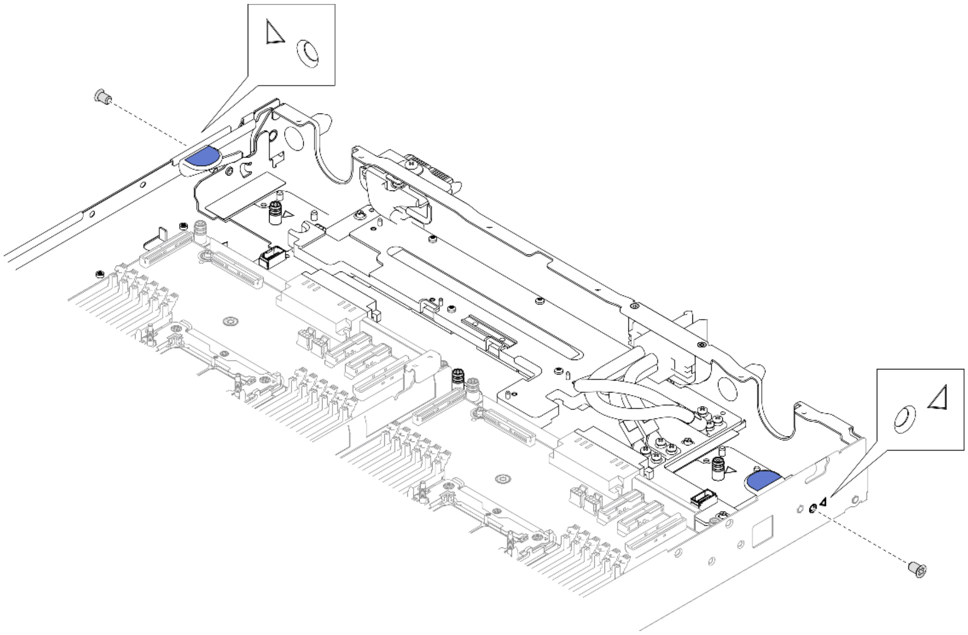


Figure 305. Installing screws from the outside of the tray.

Step 7. Fasten the three PH1 captive screws to install the PDB tray to the server tray.

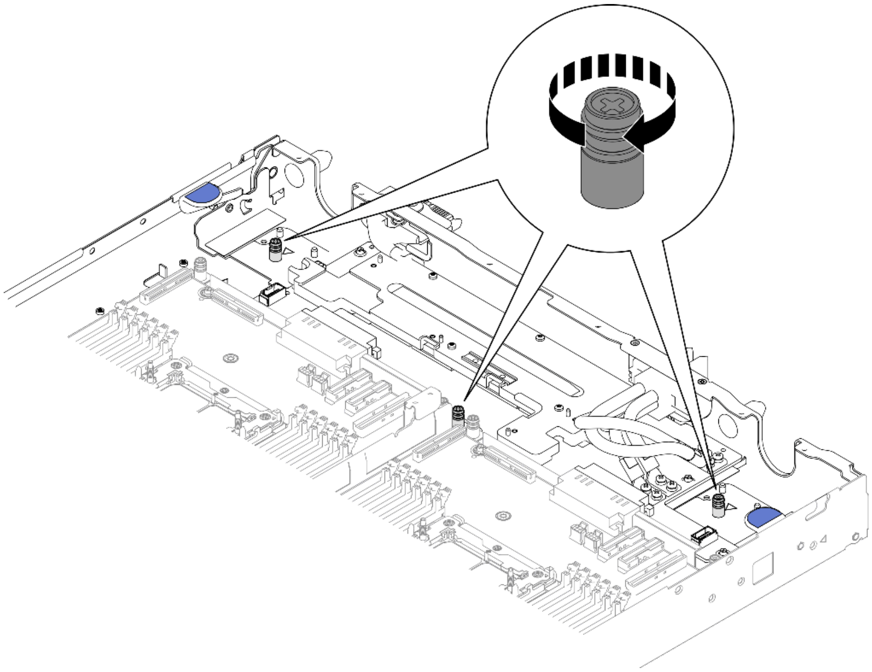


Figure 306. Fastening captive screws

After you finish

1. Install the water loop. See "Install the water loop" on page 395.
2. Install the leakage sensor. See "Install the leakage sensor" on page 200.
3. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.
4. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.

5. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
6. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
7. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
8. Install the cross braces. See "Install the cross braces" on page 109.
9. Install the memory module, perform one of the following.
   - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
   - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
10. Install the DIMM comb. See "Install a DIMM comb" on page 114.
11. Install the tray cover. See "Install the tray cover" on page 373.
12. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
13. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.
14. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Processor replacement (trained technician only)

Use the following procedures to replace an assembled processor.

Attention: Before you begin replacing a processor, make sure that you use Lenovo proven alcohol cleaning pad and thermal grease.

Important: The processor in your solution can throttle in response to thermal conditions, temporarily lowering its speed to reduce heat output. In instances where a few processor cores are throttled for an extremely short time period (100 ms or less), the only indication might be an entry in the operating system event log with no corresponding entry in the system XCC event log. If this situation occurs, the event can be ignored and processor replacement is not required.

Remove a processor

This task has instructions for removing an assembled processor. This task requires a Torx T30 driver.

About this task

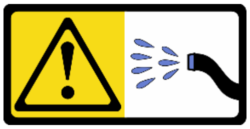
S038

CAUTION:
Eye protection should be worn for this procedure.

S040

CAUTION:
Protective gloves should be worn for this procedure.

S042



⚠**DANGER**

Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- Each processor socket must always contain a cover. When removing or installing a processor, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or water loop to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from the cold plate until you are instructed to do so.
- Before you install a new or replace a processor, update your system firmware to the latest level. See "Update the firmware" on page 427.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

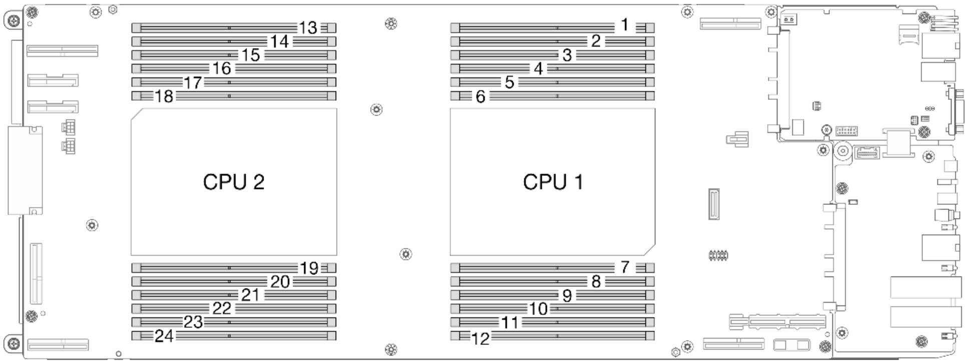


Figure 307. Processor socket and memory module connector location

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Note: Depending on the model, your solution might look slightly different from the illustration.

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

d. Remove the memory module, perform one of the following.

  - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
  - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

j. Remove the sideband cable kit. See "Remove the system management sideband cable kit" on page 327.

k. Remove the leakage sensor module. See "Remove the leakage sensor" on page 197.

Step 2. Remove the four PH 1 screws to remove the middle drive cold plates from the water loop.

Note: There are two middle drive cold plates per node, make sure to remove both cold plates from the side of water loop where the processor is to be removed.

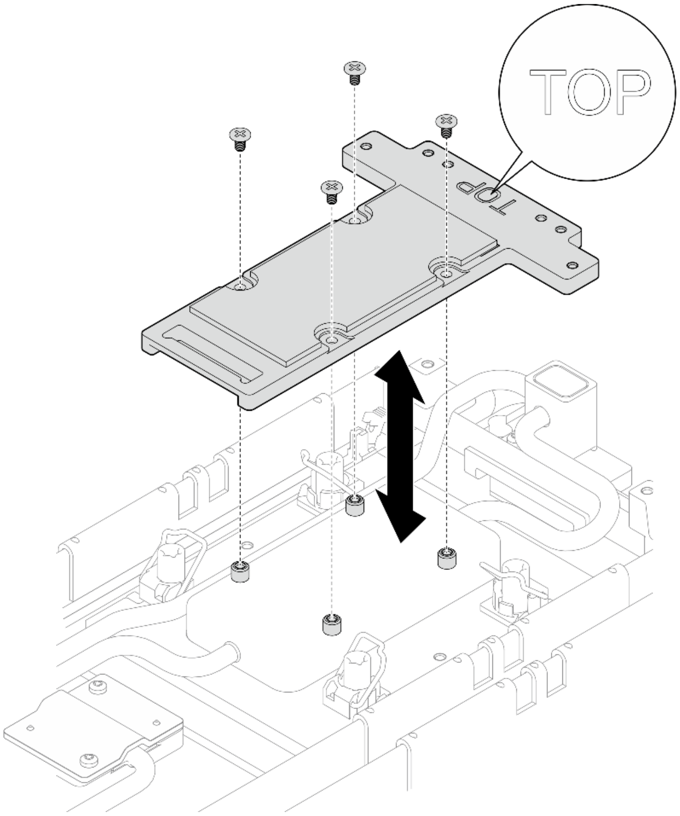


Figure 308. Removing middle drive cold plate

Step 3. Remove the VR cover from the water loop.

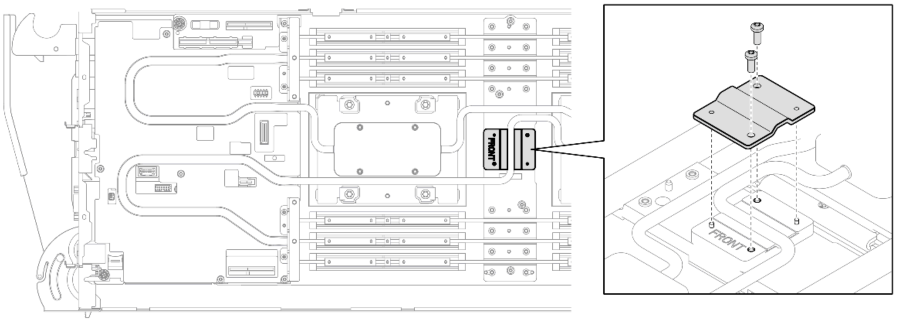


Figure 309. Removing the VR cover

Step 4. Remove four PH 1 screws to remove the quick connect.

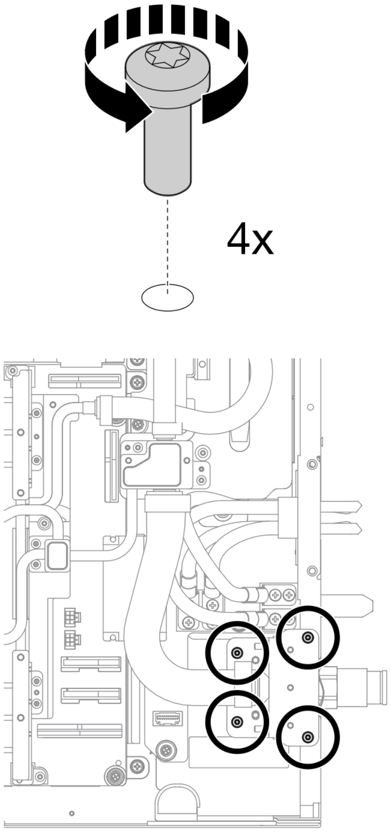


Figure 310. Removing quick connect screws

Step 5. Remove four Torx T10 screws to remove the mixing chambers from the power distribution board cold plate with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

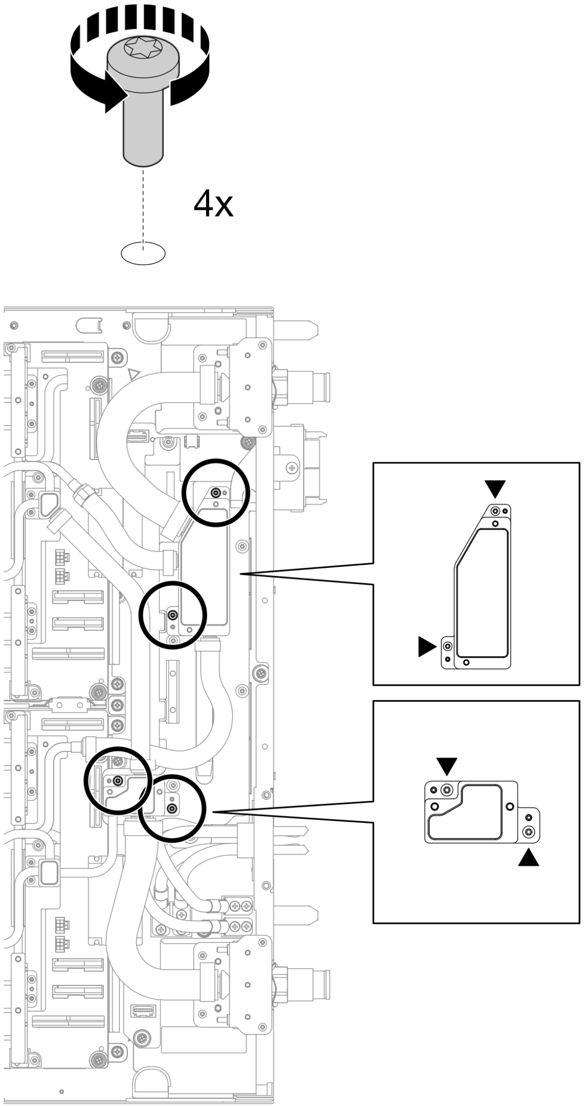


Figure 311. Installing mixing chamber screws

Step 6. Remove water loop screws (9x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

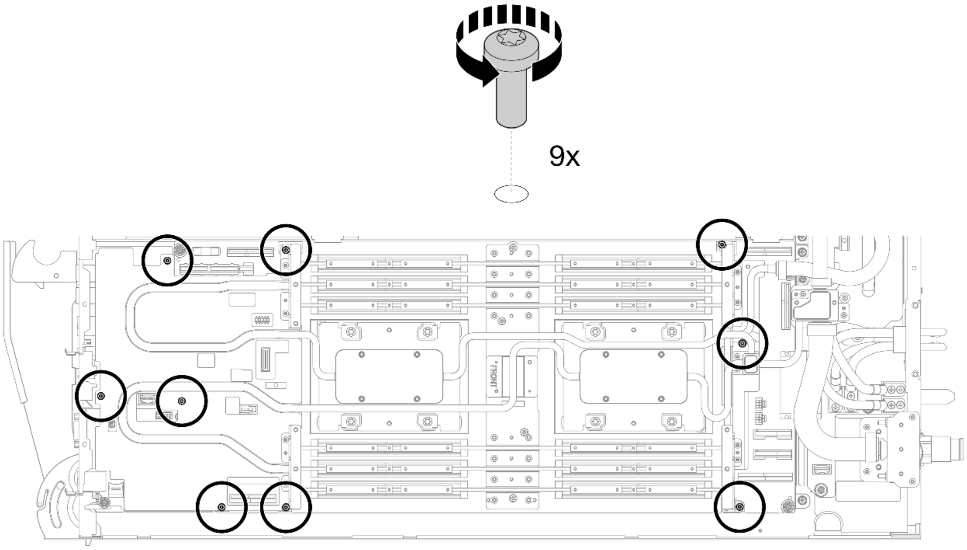


Figure 312. Water loop screws installation

Step 7. Loosen processors properly.

a. ① Fully loosen all Torx T30 captive screws on cold plates (8x Torx T30 captive screws per nodes) following the screw sequence label on the shipping bracket, with a torque screwdriver set to the proper torque.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 8+/- 0.5 lbf-in, 0.9+/- 0.05 N-m.
- To prevent damage to components, make sure that you follow the indicated tightening/ loosening sequence.

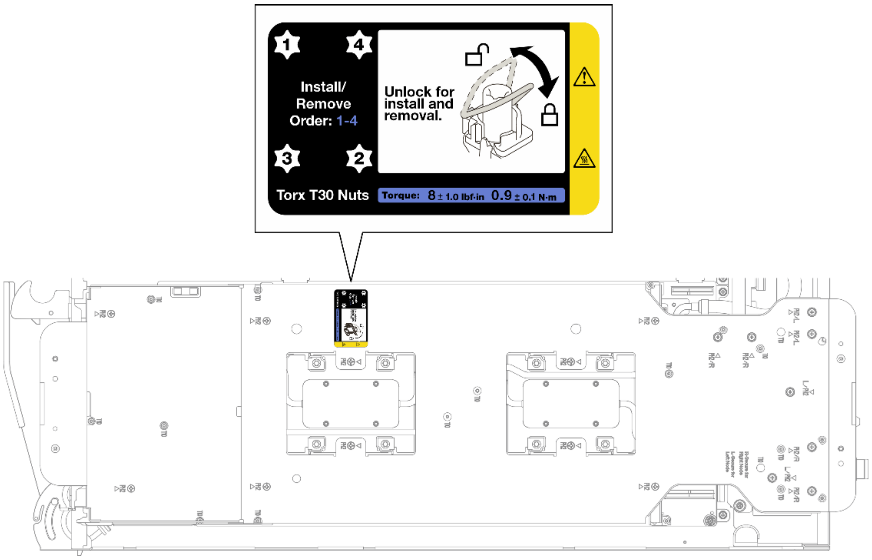


Figure 313. Screw tightening/loosening sequence on the shipping bracket label

b. ② Rotate all anti-tilt wire bails (8x anti-tilt wire bails for two nodes) inwards to the unlocked position.

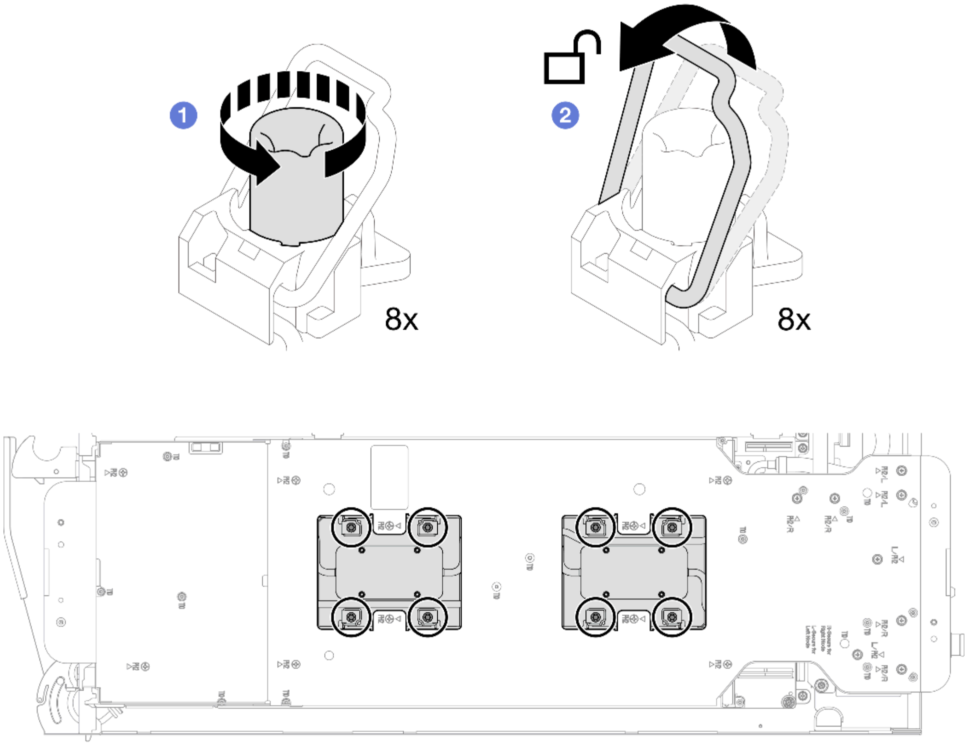


Figure 314. Loosening Torx T30 captive screws

Step 8. Orient two water loop carriers with the guide pins; then, gently put the two water loop carriers down and ensure they are seated firmly on the water loop.

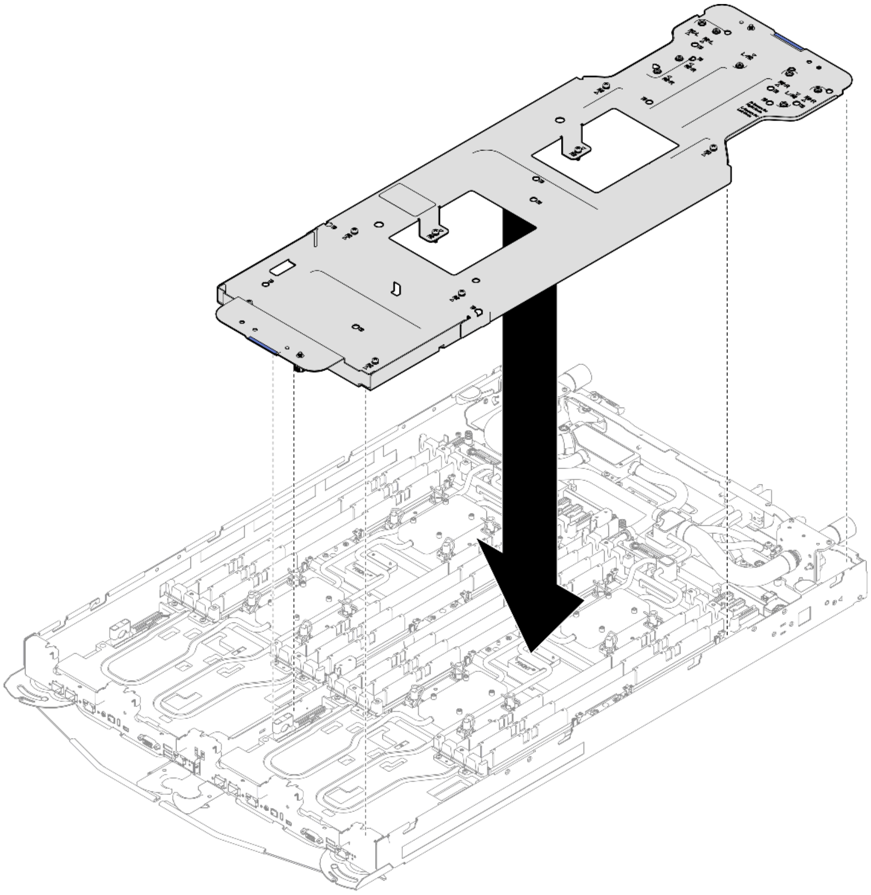


Figure 315. Installing water loop carrier

Step 9. Install water loop carrier screws (14x Phillips #2 screws for two nodes).

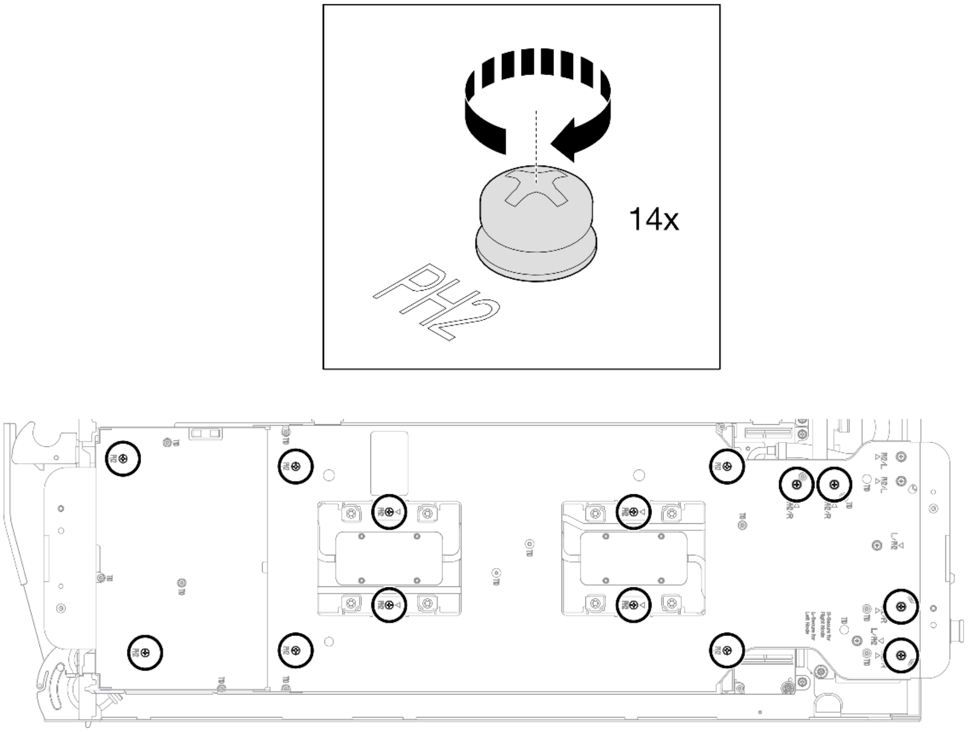


Figure 316. Installing water loop carrier screws

Step 10. Carefully rotate the water loop so one half is sitting on top of the other half.

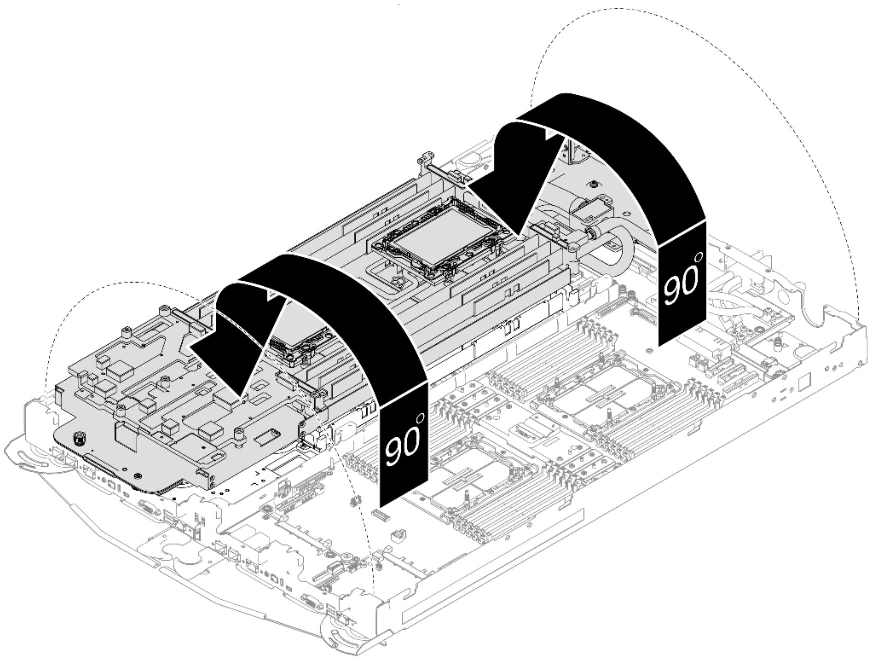


Figure 317. Unfolding water loop

Step 11. Remove the processor from the retainer.

a. ① Lift the handle to release the processor from the retainer.

b. ② Carefully hold the processor by its edges; then, lift the processor from the retainer.

Note: Do not touch the contacts on the processor.

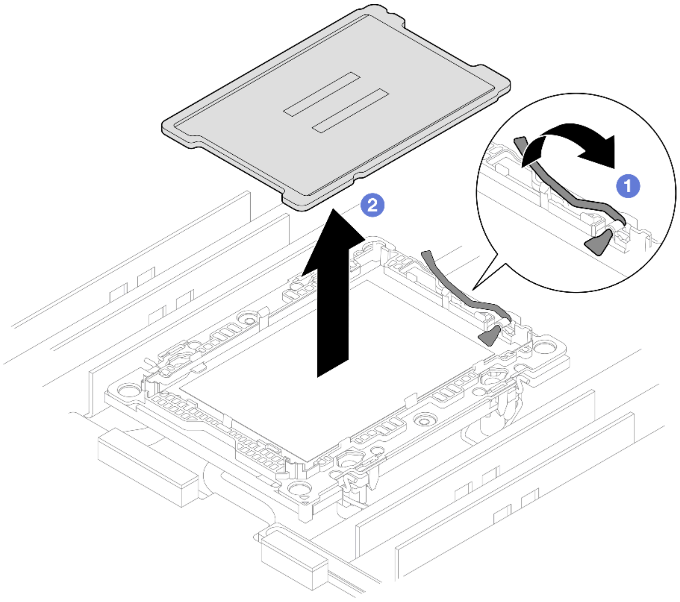


Figure 318. Processor removal

Step 12. Without putting the processor down, wipe the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

Step 13. Remove the processor retainer from the underside of the cold plate.

Note: The processor retainer will be discarded and replaced with a new one.

a. ① Carefully release the retaining clips from the cold plate.

b. ② Lift the retainer from the cold plate.

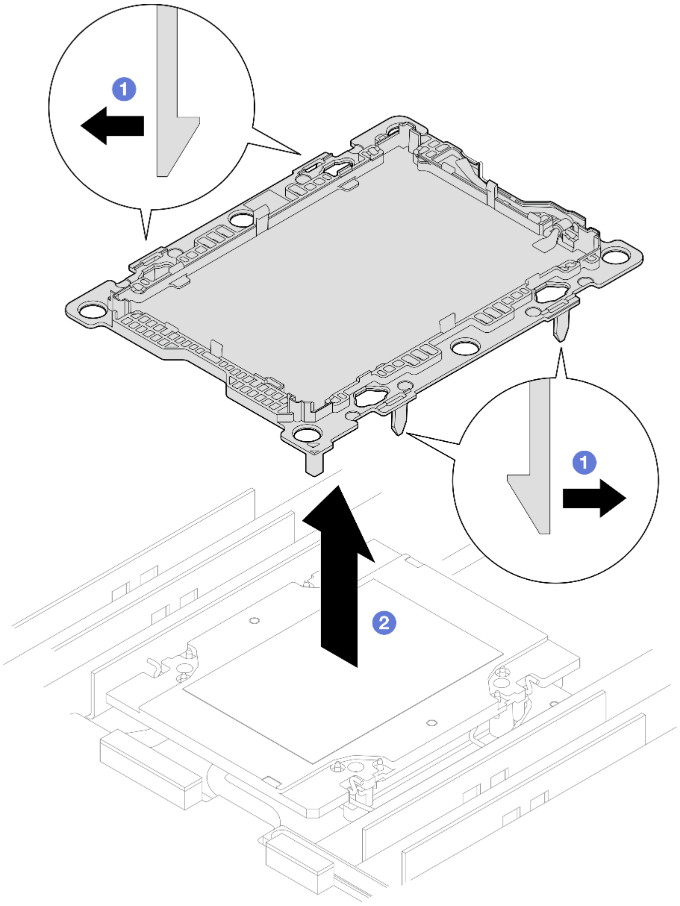


Figure 319. Processor retainer removal

Step 14. Wipe the thermal grease from the bottom of the cold plate with an alcohol cleaning pad.

After you finish

- If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a processor

This task has instructions for installing a processor. This task requires a Torx T30 driver.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

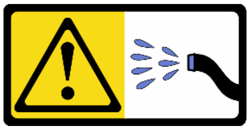
S038

CAUTION:
Eye protection should be worn for this procedure.

S040

CAUTION:
Protective gloves should be worn for this procedure.

S042



DANGER

Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- Each processor socket must always contain a cover. When removing or installing a processor, protect empty processor sockets with a cover.
- Do not touch the processor socket or processor contacts. Processor-socket contacts are very fragile and easily damaged. Contaminants on the processor contacts, such as oil from your skin, can cause connection failures.
- Do not allow the thermal grease on the processor or water loop to come in contact with anything. Contact with any surface can compromise the thermal grease, rendering it ineffective. Thermal grease can damage components, such as electrical connectors in the processor socket. Do not remove the grease cover from the cold plate until you are instructed to do so.
- Before you install a new or replace a processor, update your system firmware to the latest level. See "Update the firmware" on page 427.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

Notes:

- See https://serverproven.lenovo.com for a list of processors supported for your system. All processors on the system board must have the same speed, number of cores, and frequency.
- Optional devices available for your system might have specific processor requirements. See the documentation that comes with the optional device for information.

The following illustration shows the location of the processor sockets and memory module connectors on the system board.

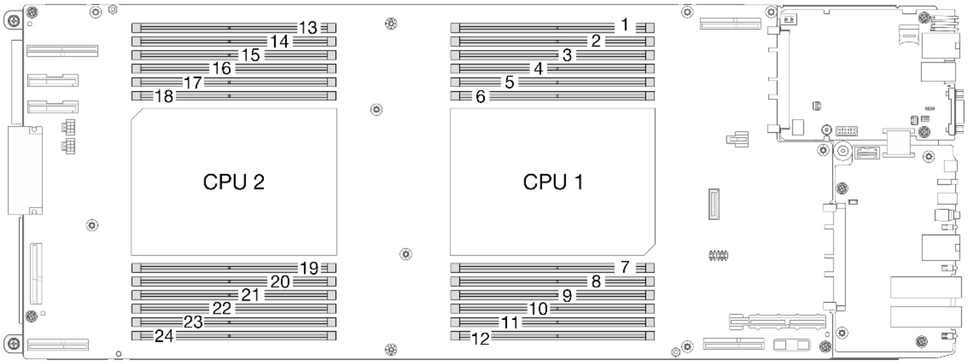


Figure 320. Processor socket and memory module connector location

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Note: Depending on the model, your solution might look slightly different from the illustration.

Attention: Make sure that the retaining clips on all memory module connectors are in the locked position.

Step 1. Clean the thermal grease on water loop processor cold plate.

a. If there is any old thermal grease on the processor cold plate on water loop, gently clean the cold plate using an alcohol cleaning pad.

b. Remove the processor identification label from the water loop and replace it with the new label that comes with the replacement processor. If you are unable to remove the label and place it on the new water loop, or if the label is damaged during transfer, write the processor serial number from the processor identification label on the new water loop in the same location as the label would be placed using a permanent marker.

c. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease

Note: Carefully place the processor and retainer on a flat surface with the processor-contact side down.

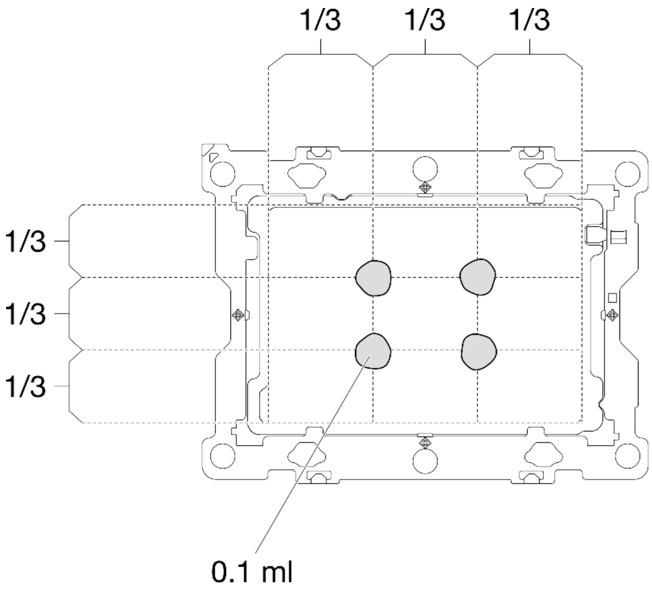


Figure 321. Thermal grease application

Step 2. Install processor retainers onto processor if needed.

a. Align the triangular mark on the processor retainer with the triangular mark on the processor corner edge.

b. Gently place the processor retainer on the processor; then, carefully press the four sides of the processor retainer to secure the processor.

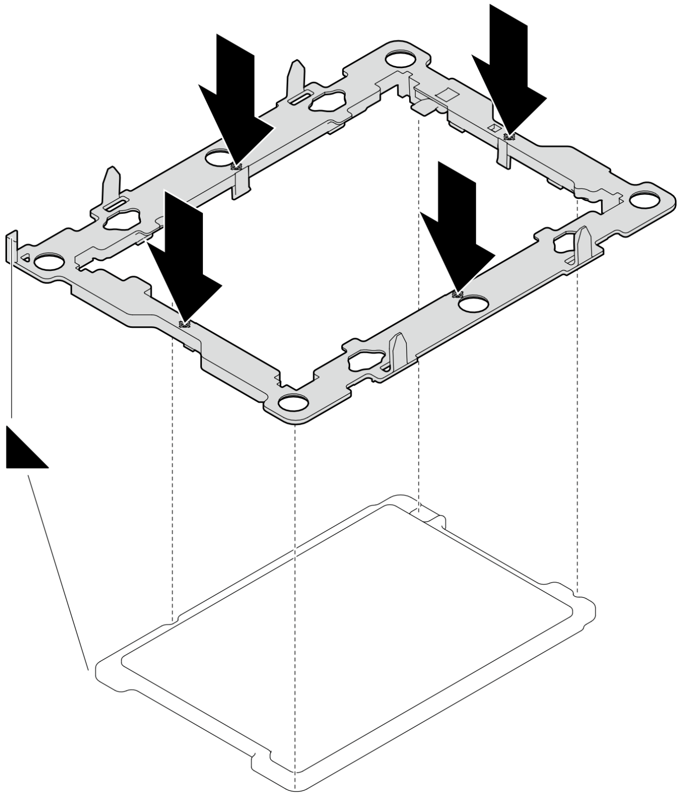


Figure 322. Installing a processor retainer

Step 3. Install the processor to the water loop. Align the triangular marks on the processor retainers with the triangular slots on the underside of the water loop cold plate; then, attach the processors to the underside of the water loop cold plate by inserting the processor retainer posts and clips features into the openings at the four corners of the cold plate.

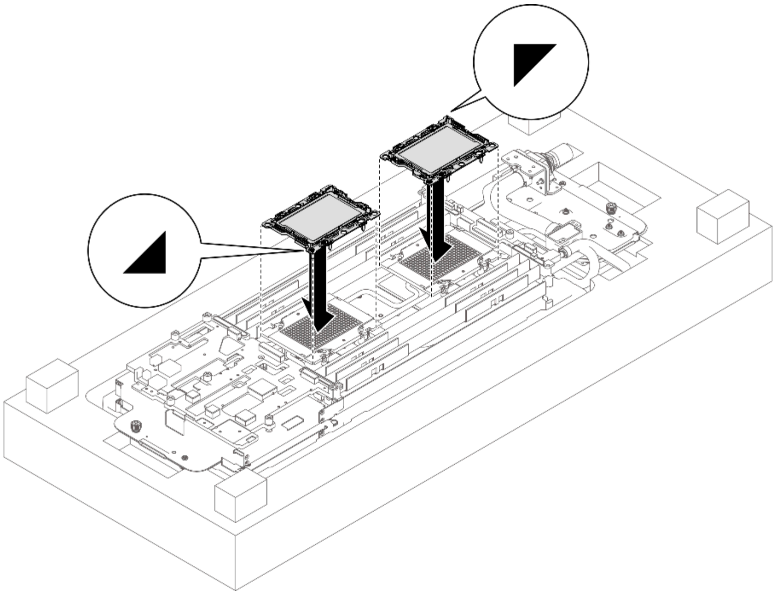


Figure 323. Installing processor to the water loop

Step 4. Rotate all anti-tilt wire bails (8x anti-tilt wire bails per node) outwards to the unlocked position.

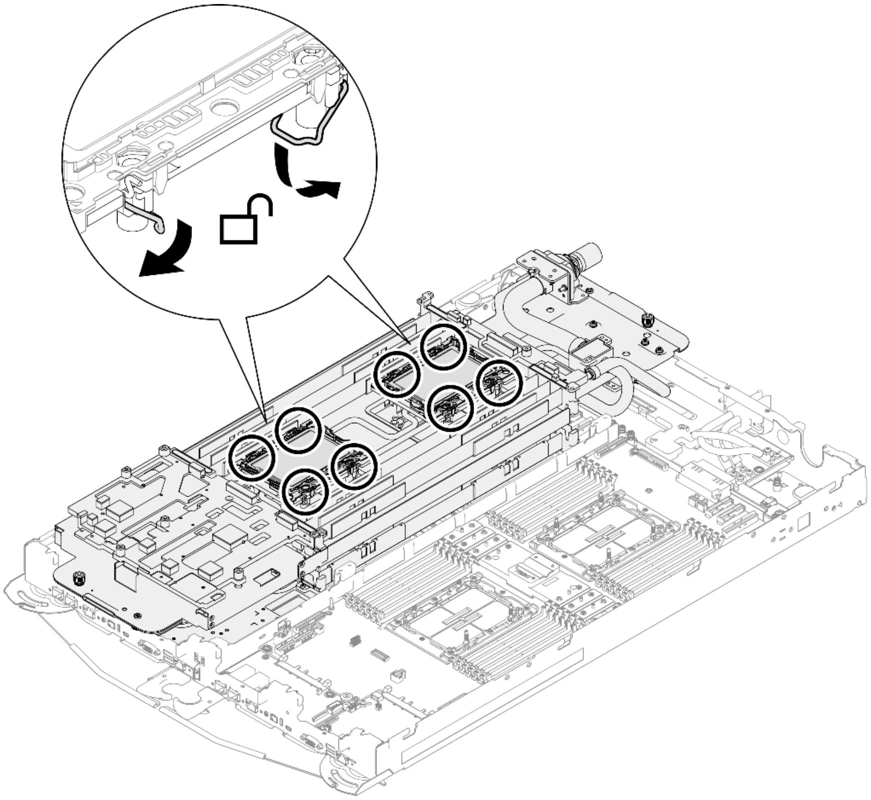


Figure 324. Unlocking Torx T30 captive screws

Step 5. Check the gap pads on the water loop, if any of them are damaged or detached, replace them with new ones.

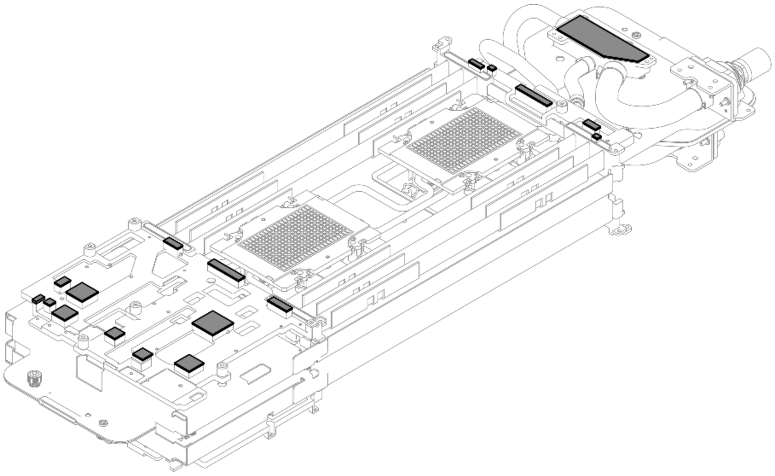


Figure 325. Water loop gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 6. Check the gap pads on the VR cold plate installed on the processor board, if any of them are damaged or detached, replace them with new ones.

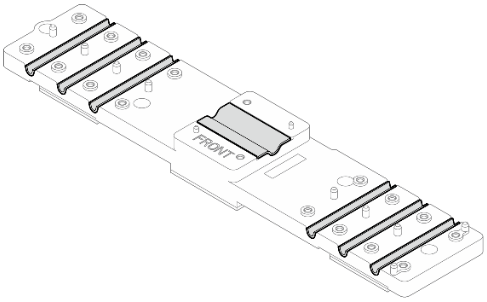


Figure 326. VR cold plate gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 7. Carefully rotate the top side of the water loop, position the water loop on the two guide pins near the rear of the node; then, gently put the water loop down and ensure it is firmly seated on the system board.

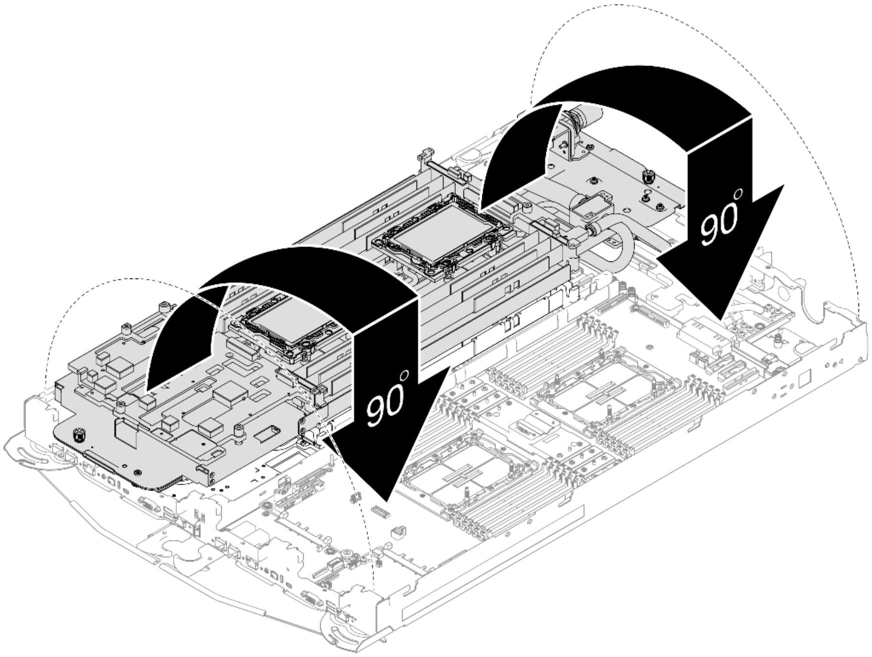


Figure 327. Water loop installation

Step 8. If applicable, install one screw to secure the mixing chamber to the tray through the hole on the shipping bracket.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

Step 9. Rotate anti-tilt wire bails (8x anti-tilt wire bails per node) outwards to the locked position.

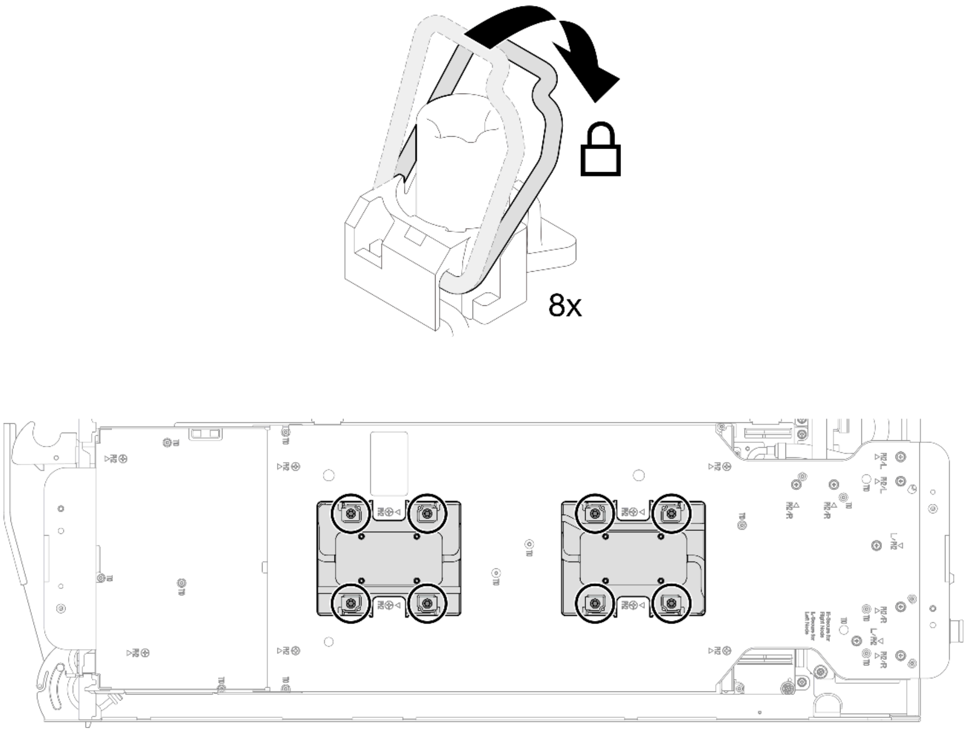


Figure 328. Unlocking anti-tilt wire bails

Step 10. Loosen water loop carrier screws (14x Phillips #2 screws for two nodes).

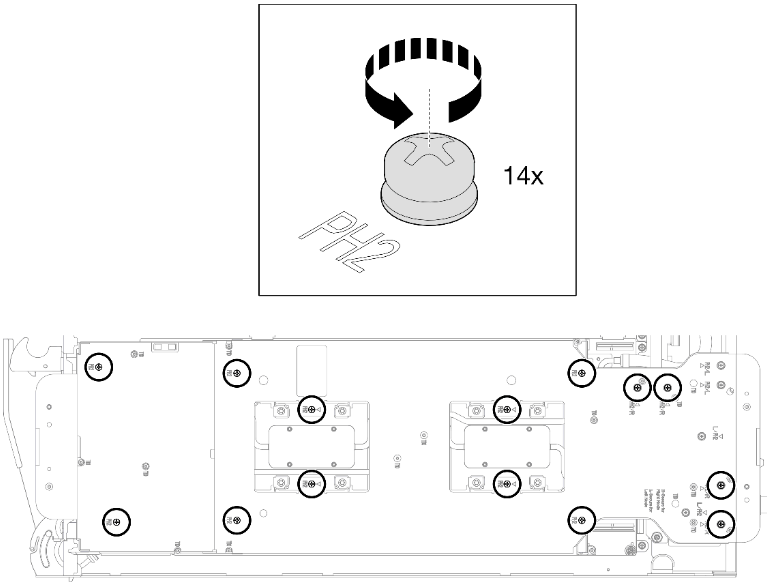


Figure 329. Loosening water loop carrier screws

Step 11. Carefully lift the water loop carrier up and away from the water loop.

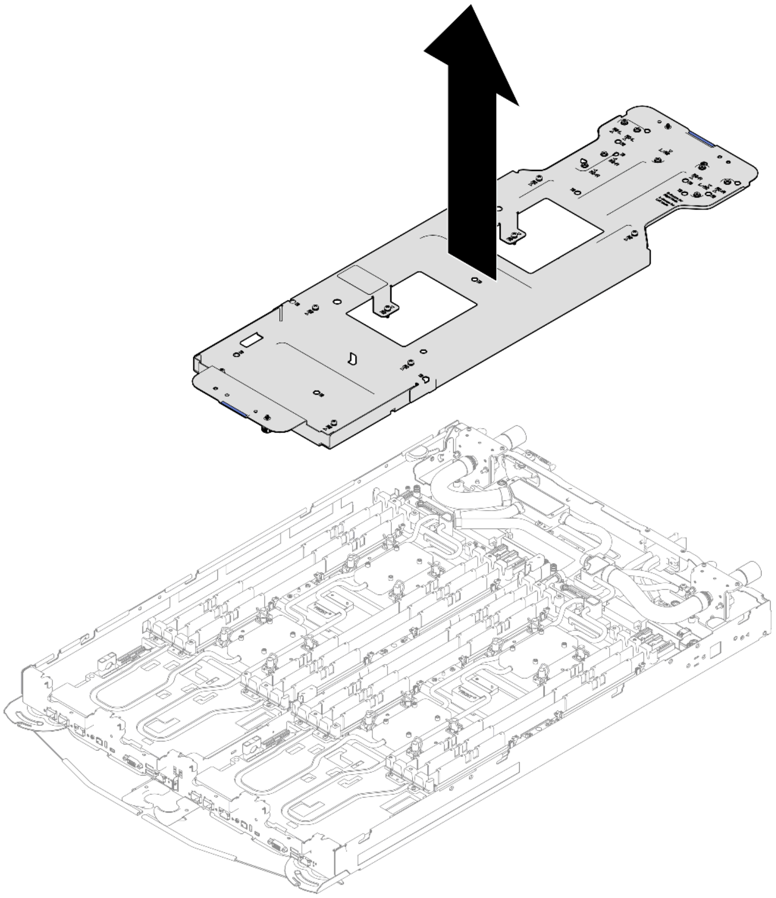


Figure 330. Water loop carrier removal

Step 12. Fully tighten all Torx T30 captive screws (8x Torx T30 captive screws for two nodes) following the screw sequence label on the shipping bracket, with a torque screwdriver set to the proper torque.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 8+/- 0.5 lbf-in, 0.9+/- 0.05 N-m.
- To prevent damage to components, make sure that you follow the indicated tightening/ loosening sequence.

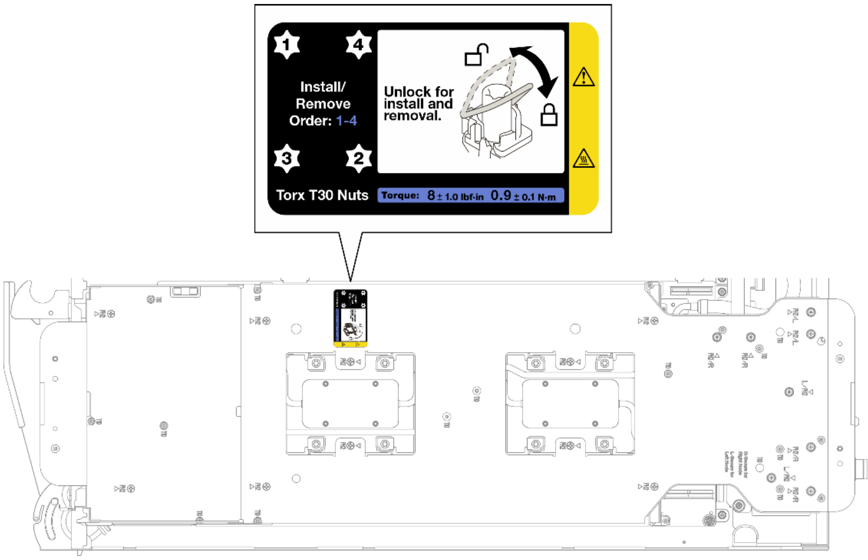


Figure 331. Screw tightening/loosening sequence on the shipping bracket label

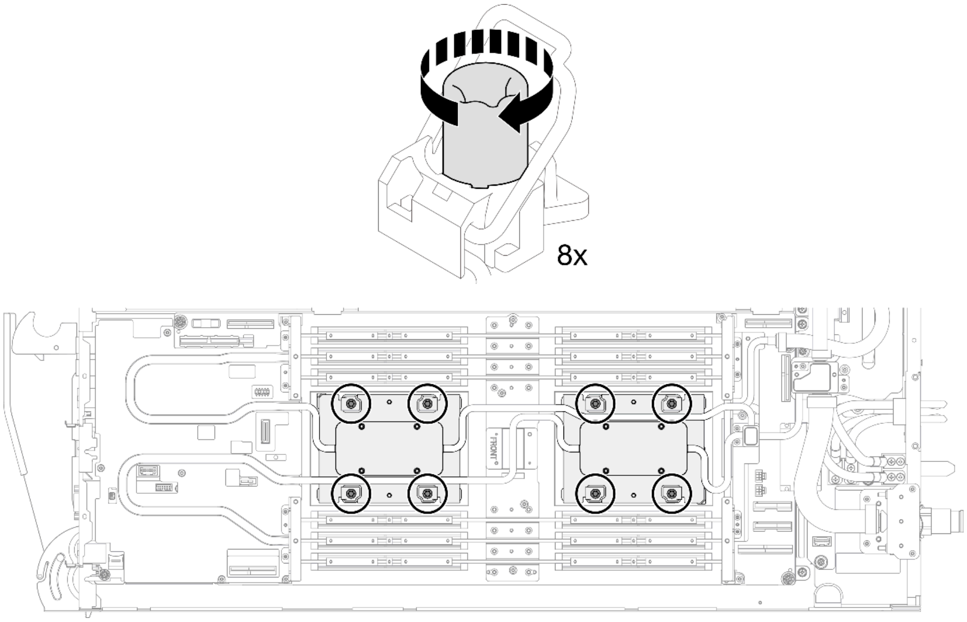


Figure 332. Tightening Torx T30 captive screws

Step 13. Install water loop screws (9x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

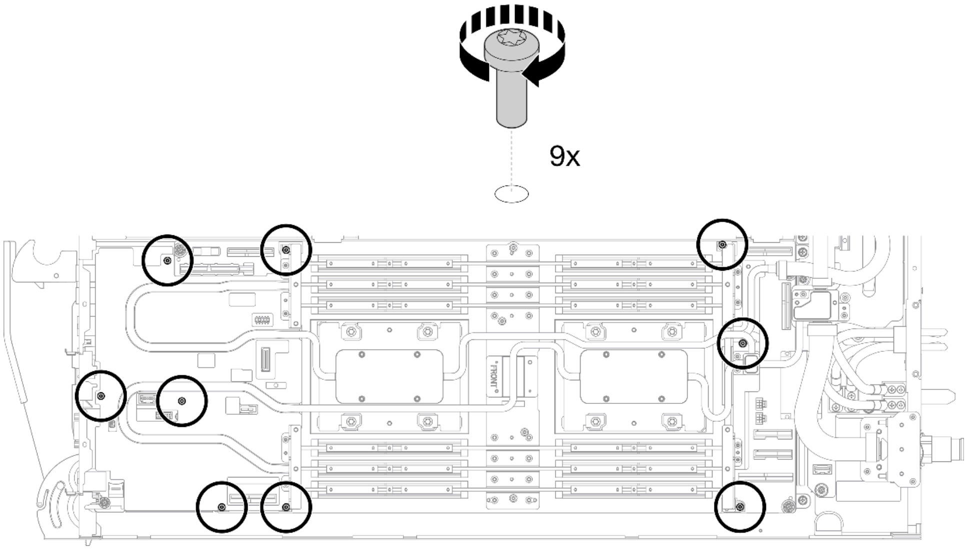


Figure 333. Water loop screws installation

Step 14. Install three Torx T10 screws to secure mixing chambers to the power distribution board cold plate with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

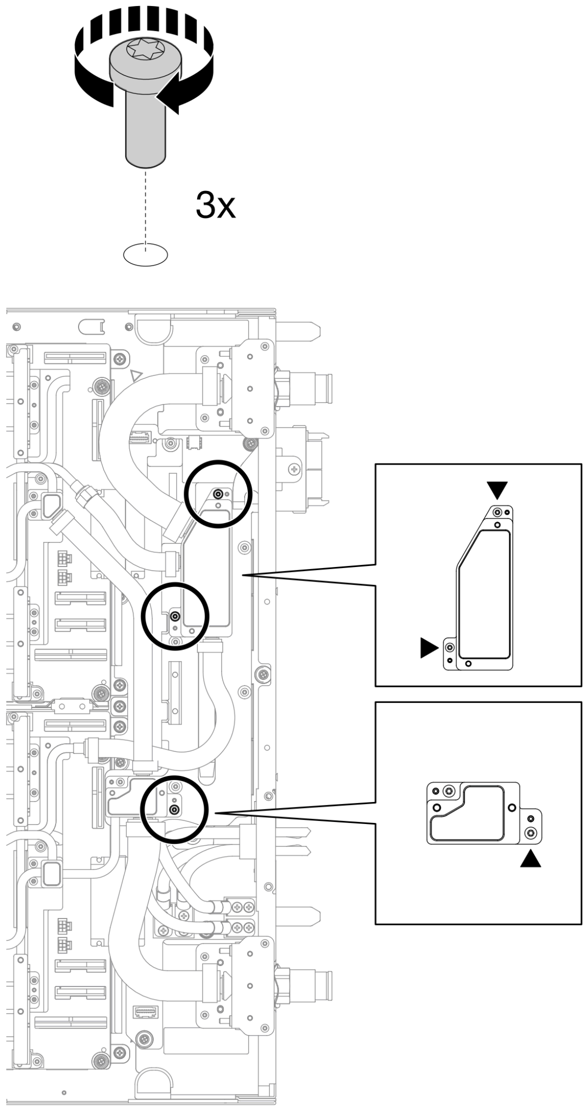


Figure 334. Mixing chamber screws installation

Step 15. Install four (4x) Torx T10 screws to secure the two quick connects to the tray.

a. ① Install the Torx T10 screws to secure the quick connect to the tray.

b. ② Install the Torx T10 screws to secure the quick connect to the power distribution board.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

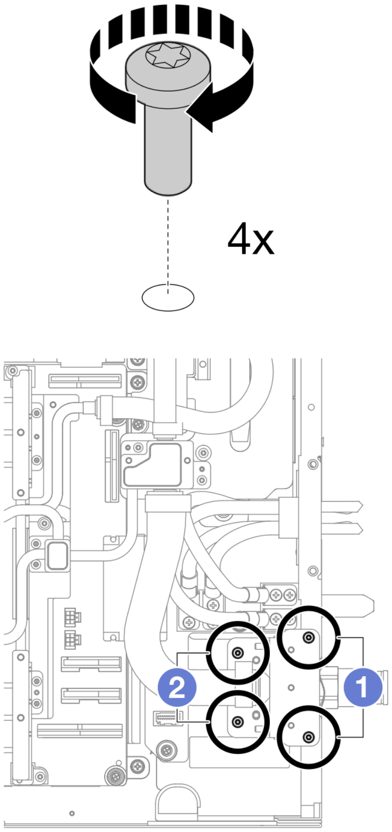


Figure 335. Quick connect screw installation

Step 16. Install the VR cover to the water loop.

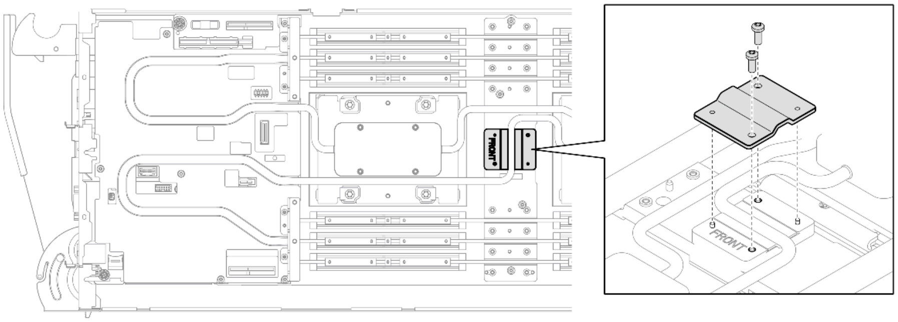


Figure 336. Installing the VR cover

Step 17. Check the gap pad on the top side of the E3.S middle cold plate, if it is damaged or detached, replace them with new one.

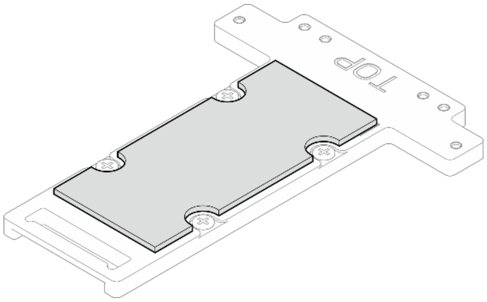


Figure 337. E3.S middle cold plate top side gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 18. Replace the single-use gap pad on bottom side of the E3.S middle cold plate a with new one.

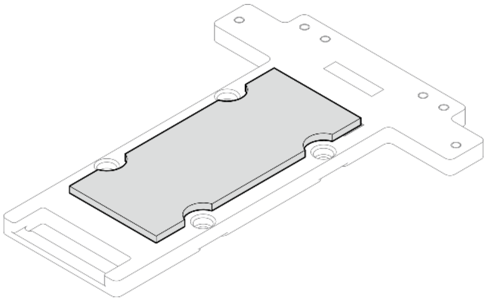


Figure 338. E3.S middle cold plate bottom side single-use gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 19. Install four PH1 screws to install the middle drive cold plates to the water loop. **Make sure** to keep the “TOP” marking facing the rear of tray.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Make sure to install all four middle drive cold plates to the water loop (two cold plates per node).

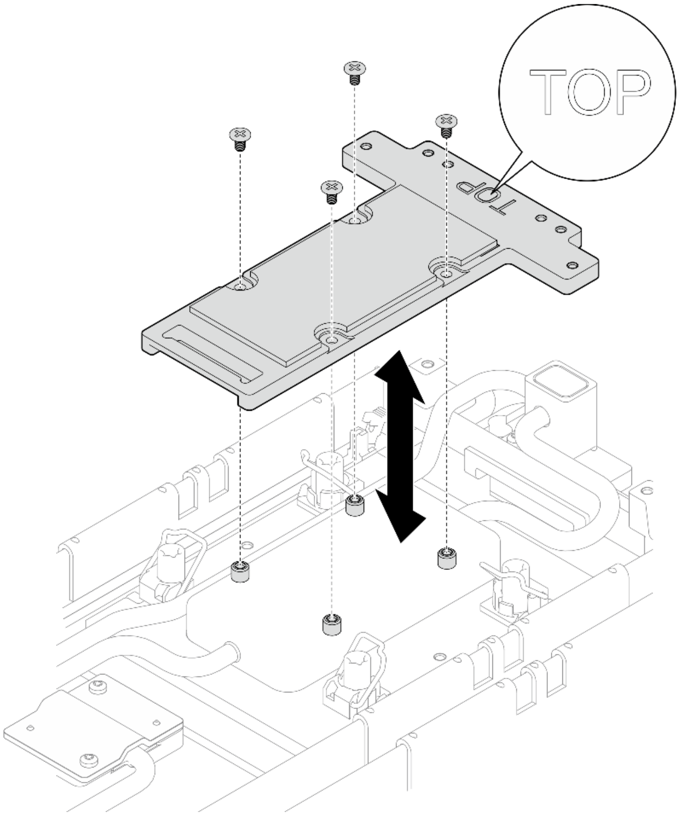


Figure 339. Install the middle drive cold plate

After you finish

1. Install the leakage sensor. See "Install the leakage sensor" on page 200.
2. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.
3. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
4. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
5. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
6. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
7. Install the cross braces. See "Install the cross braces" on page 109.
8. Install the memory module, perform one of the following.
   - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
   - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
9. Install the DIMM comb. See "Install a DIMM comb" on page 114.
10. Install the tray cover. See "Install the tray cover" on page 373.
11. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
12. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.

13. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Processor board replacement (trained technician only)

Follow instructions in this section to remove and install the processor board.

Important: Before you return the processor board, make sure that you install the CPU socket dust covers from the new processor board. To replace a CPU socket dust cover:

1. Take a dust cover from the CPU socket assembly on the new processor board and orient it correctly above the CPU socket assembly on the removed processor board.
2. Gently press down the dust cover legs to the CPU socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the dust cover is securely attached.
3. **Make sure** that the dust cover is securely attached to the CPU socket assembly.

Remove the processor board

Use this information to remove the processor board.

About this task

Required tools

- Screwdriver for M3 PH1, PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- Down VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

d. Remove the memory module, perform one of the following.
   - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
   - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

j. Remove the sideband cable kit. See "Remove the system management sideband cable kit" on page 327.

k. Remove the leakage sensor module. See "Remove the leakage sensor" on page 197.

Step 2. **(Optional)** When removing processor board from Node A, remove the leakage sensor module holder. Remove two screws from the holder, and remove it from the tray.

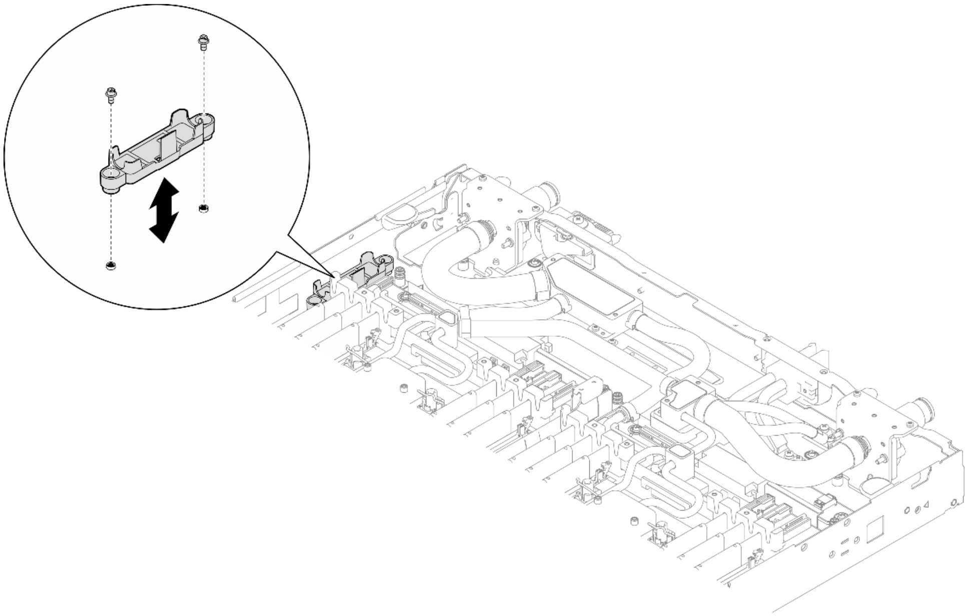


Figure 340. Removing leakage sensor module bracket screws

Step 3. Remove the water loop from the tray. See "Remove the water loop" on page 375.

Step 4. Remove the front I/O board. See "Remove the front I/O board" on page 180.

Step 5. Remove the system I/O board.

a. ① Remove two M3 PH1 screws from the system I/O board.

b. ② Remove the system I/O board from the system board assembly.

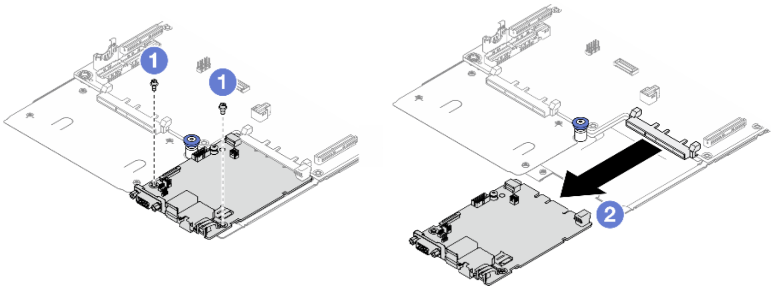


Figure 341. Removing the system I/O board

Step 6. Remove the four Torx T10 screws (per node) to remove the VR cold plate from the processor board.

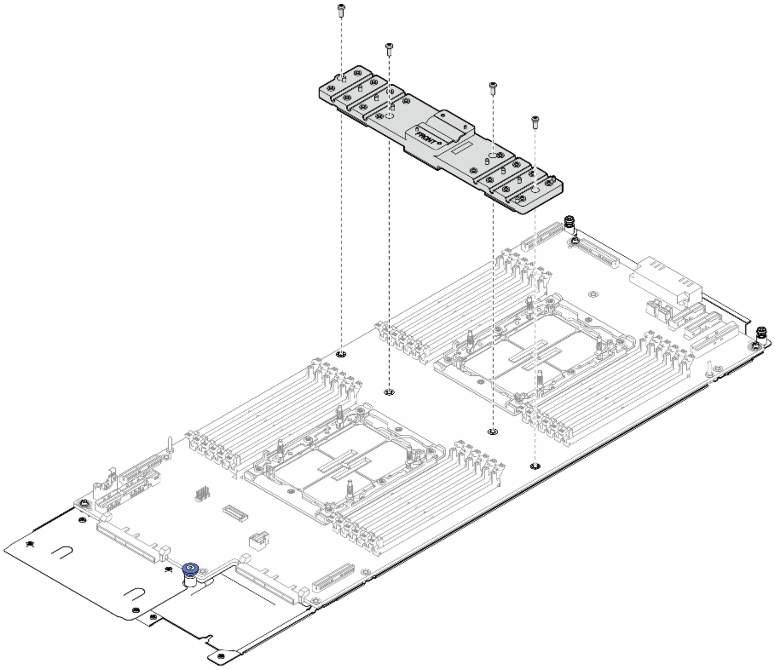


Figure 342. Removing VR cold plate

Step 7. Remove the processor board.

a. ① Remove three Phillips #1 screws per node on the system board (with a torque screwdriver set to the proper torque).

b. ② Remove the processor board.

Note: For reference, the torque required for the screws to be fully tightened/removed is 0.5-0.6 newton-meters, 4.5-5.5 inch-pounds.

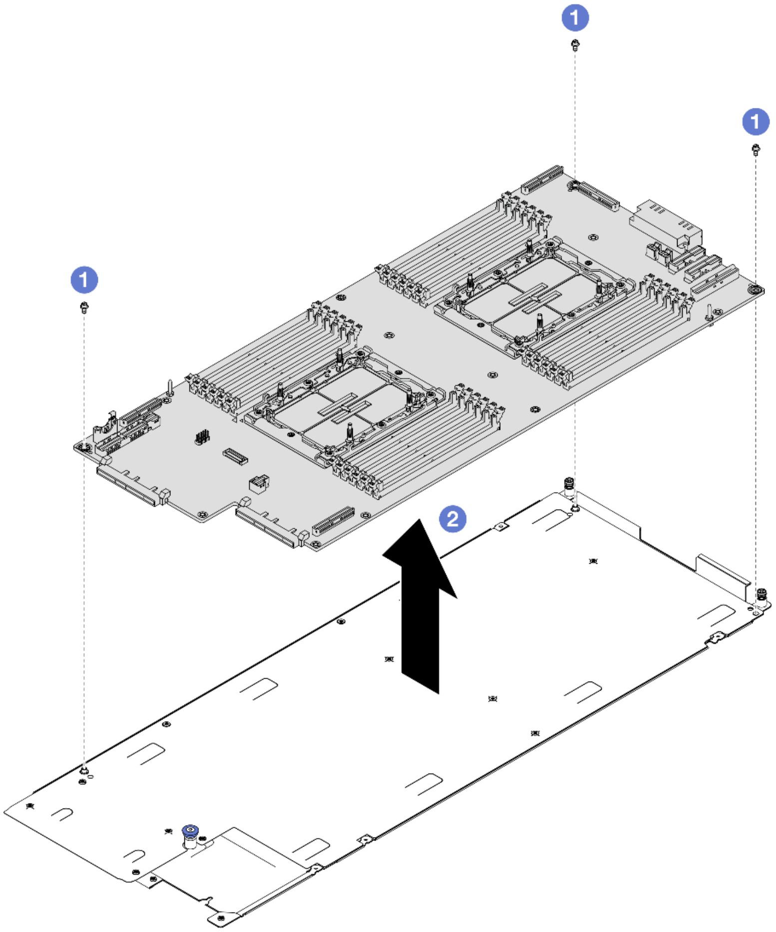


Figure 343. Processor board screws removal

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Important: Before you return the processor board, make sure that you install the processor socket dust covers from the new system board. To replace a processor socket dust cover:

1. Take a dust cover from the processor socket assembly on the new processor board and orient it correctly above the processor socket assembly on the removed processor board.
2. Gently press down the dust cover legs to the processor socket assembly, pressing on the edges to avoid damage to the socket pins. You might hear a click on the dust cover is securely attached.
3. **Make sure** that the dust cover is securely attached to the processor socket assembly.

Install the processor board

Use this information to install the processor board.

About this task

Required tools

- Screwdriver for M3 PH1, PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)

- Down VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Note: Depending on the model, your solution might look slightly different from the illustration.

Step 1. Install the processor board.

a. ① Align the processor board with three guide flanges on the supporting metal sheet; then, install the processor board.

b. ② Install three Phillips #1 screws per node on the processor board (with a torque screwdriver set to the proper torque).

Note: For reference, the torque required for the screws to be fully tightened/removed is 0.5-0.6 newton-meters, 4.5-5.5 inch-pounds.

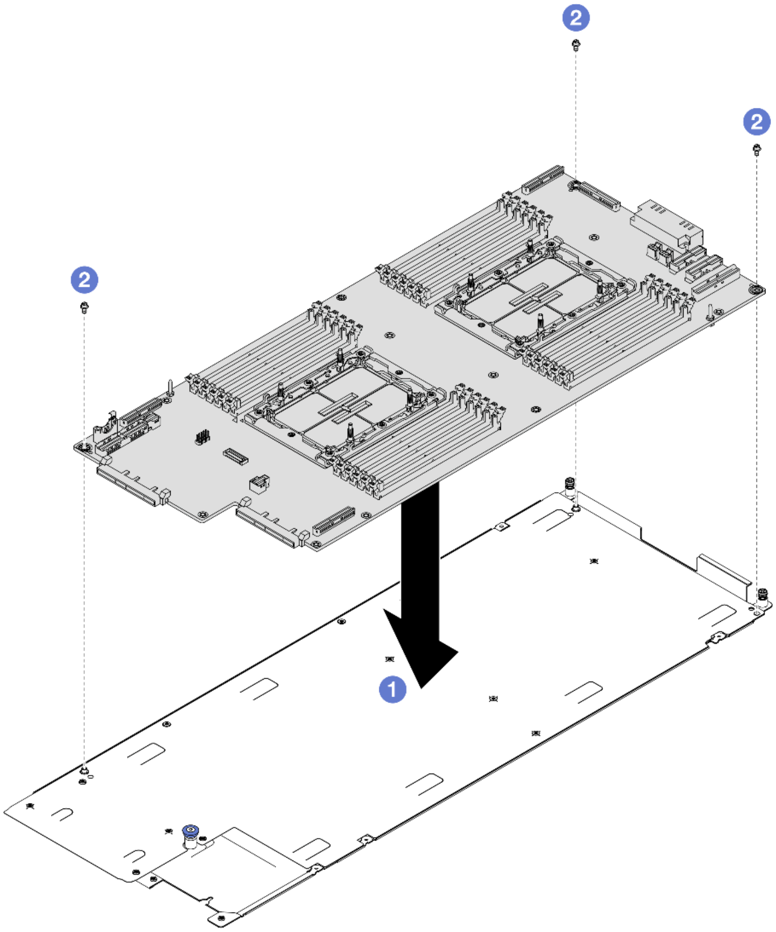


Figure 344. Processor board installation

Step 2. Check the gap pads on the top side of the VR cold plate, if any of them are damaged or detached, replace them with new ones.

Note: Make sure to follow Gap pad replacement guidelines.

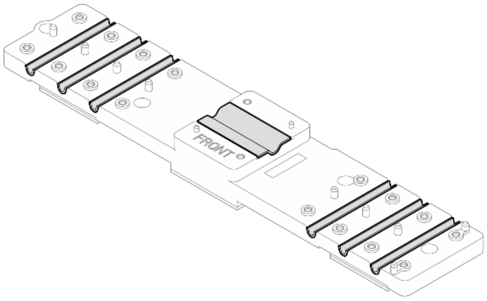


Figure 345. VR cold plate top side gap pads locations

Step 3. Replace the single-use gap pads on bottom side of the VR cold plate with new ones.

Note: Make sure to follow Gap pad replacement guidelines.

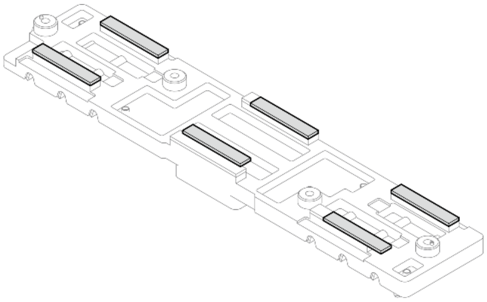


Figure 346. VR cold plate bottom side single use gap pads locations

Step 4. Install the four Torx T10 screws (per node) to install the VR cold plate to the processor board.

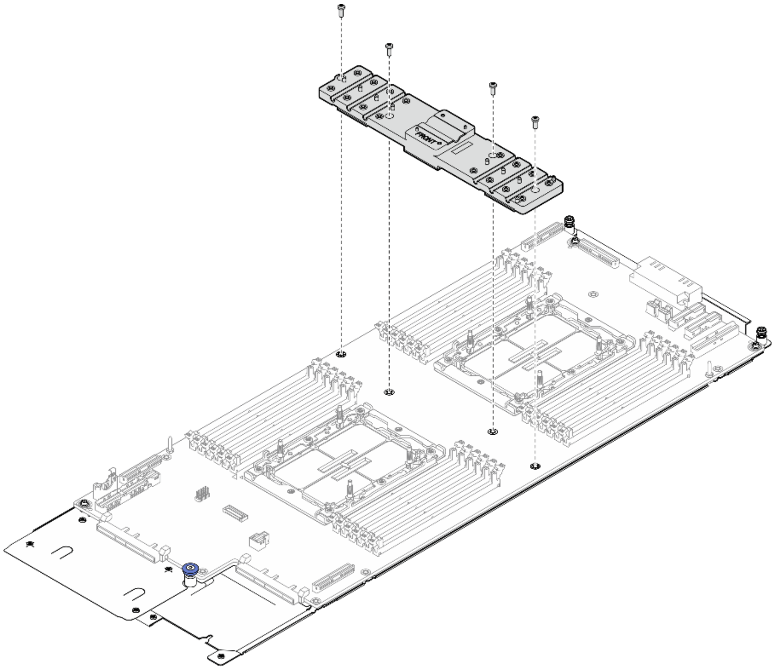


Figure 347. Installing VR cold plate

Step 5. Install the system I/O board.

a. ① Install the system I/O board to the system board assembly.

b. ① Install two M3 PH1 screws to secure the system I/O board to the system board assembly.

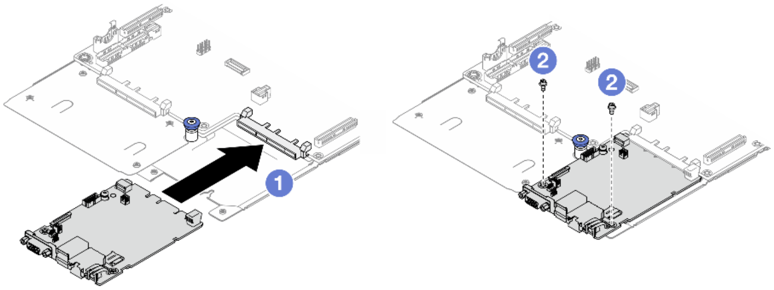


Figure 348. Installing the system I/O board

Step 6. Install the front I/O board to the system board assembly.

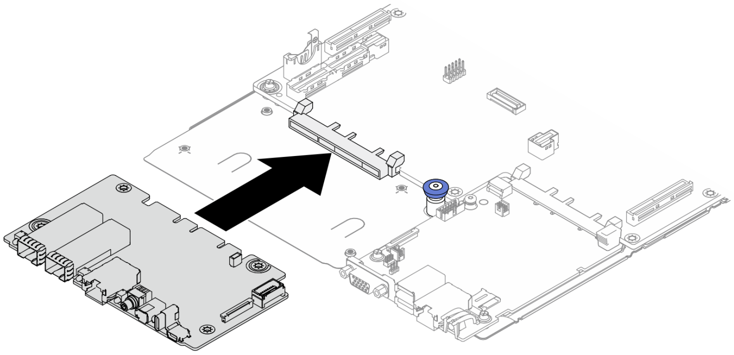


Figure 349. Installing the front I/O board

Step 7. There is a Mylar sheet between the front I/O board and the supporting metal sheet.

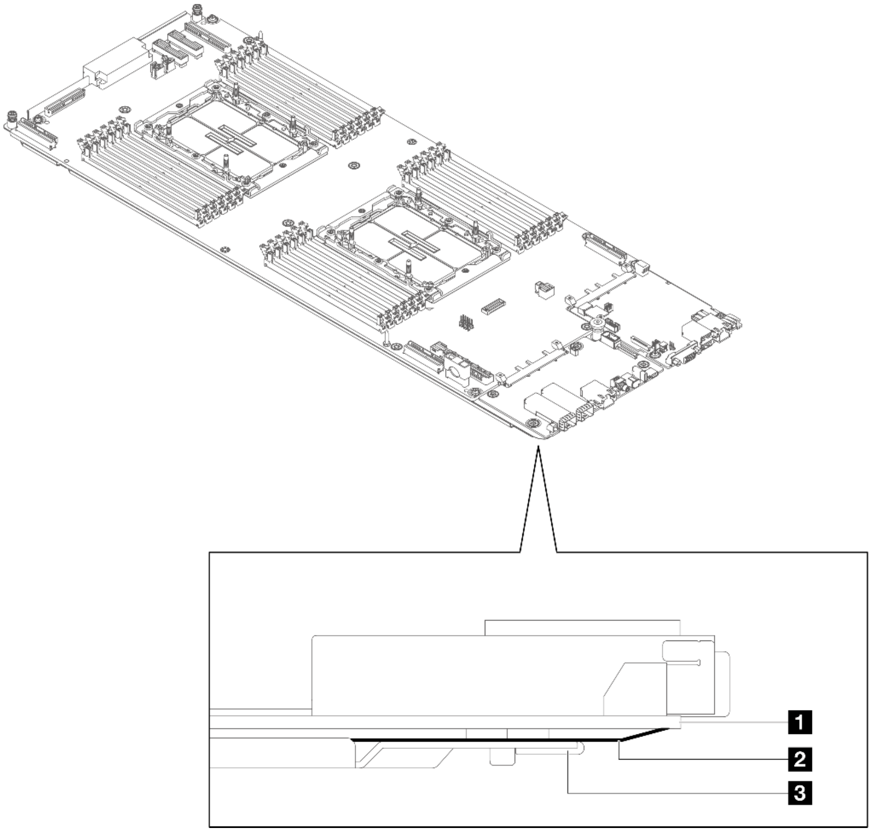


Figure 350. Side view of front I/O board portion of the system-board assembly

1 Front I/O board	**2** Mylar sheet	**3** Supporting sheet metal

a. Insert the tip of the DIMM tool between the front I/O board and the Mylar sheet. Then, use the tip to press down the Mylar sheet to prevent the dip pins on the bottom of the FIO board sticking to the Mylar sheet.

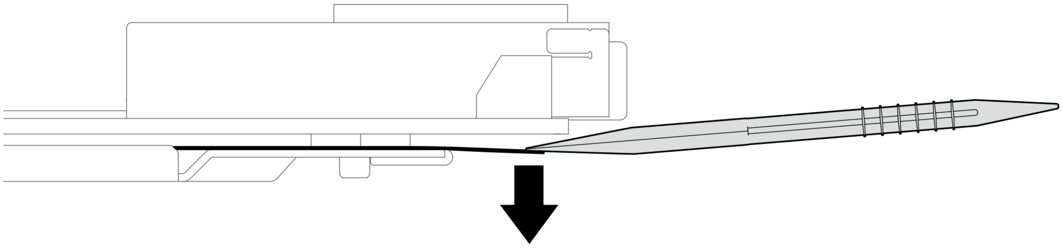


Figure 351. Separating Mylar sheet from front I/O board

Step 8. Install two M3 PH1 screws to secure the front I/O board to the system board assembly.

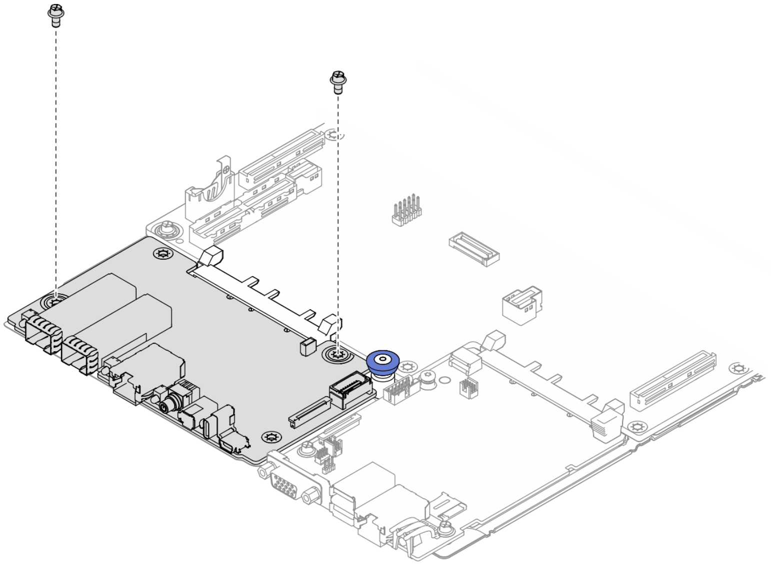


Figure 352. Installing front I/O board screws

Step 9. Install the FPC cable to the front I/O board and the system I/O board.

a. Pull up the latch of the connectors on the front I/O board and the system I/O board.

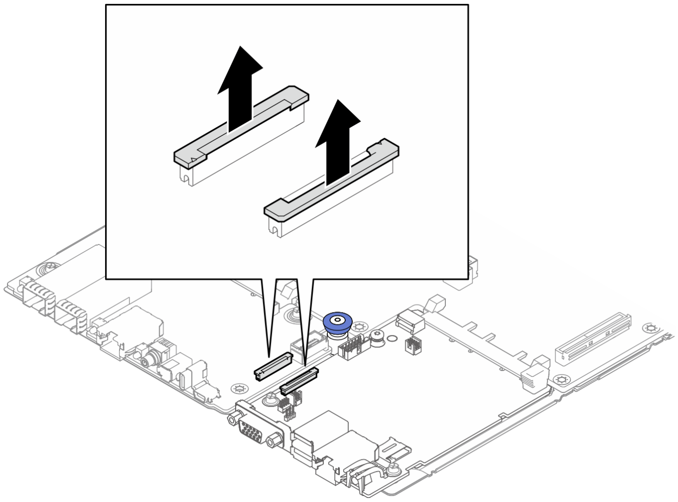


Figure 353. Pulling up connector latches

b. Match the silkscreen on the FPC cable and the connectors. Then, install the FPC cable to the front I/O board and the system I/O board.

FPC cable connection to FIO board and system I/O board		
From		**To**
FPC cable end marked as FIO SIDE	→	FIO SIDE connector on Front I/O board
FPC cable end marked as SCM SIDE	→	PHY CONN connector on system I/O board

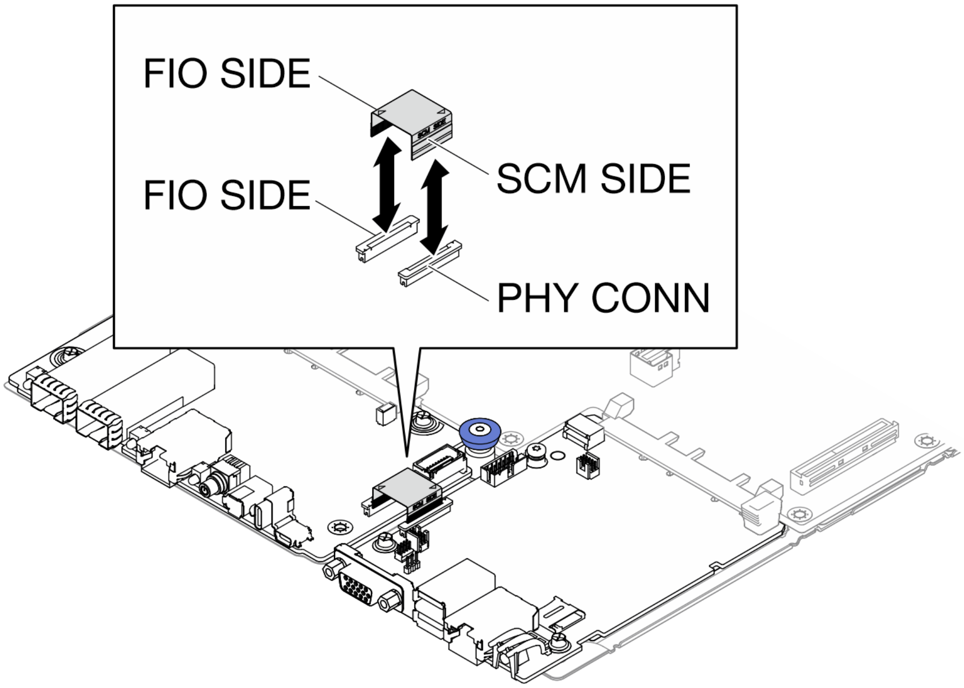


Figure 354. FPC cable connection

c. There is a white line on both ends of the FPC cable. Insert the FPC cable to the connectors until the white lines are invisible. The FPC cable is ***not*** installed correctly if the white lines are visible.

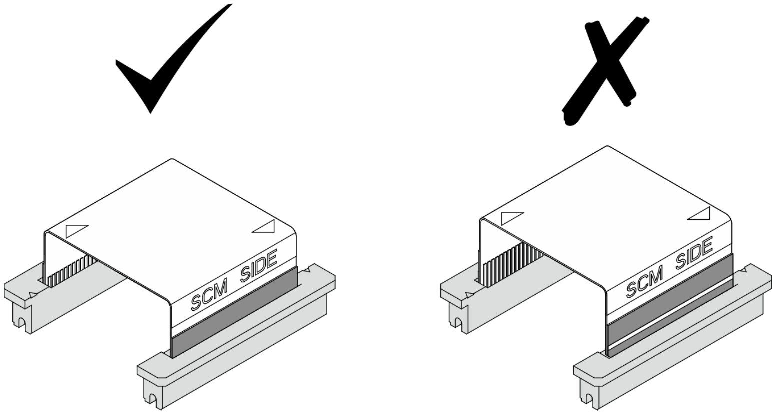


Figure 355. Checking proper FPC cable installation

If the white line is still visible after inserting the FPC cable, check if the connector latches are fully pulled up and loosen.

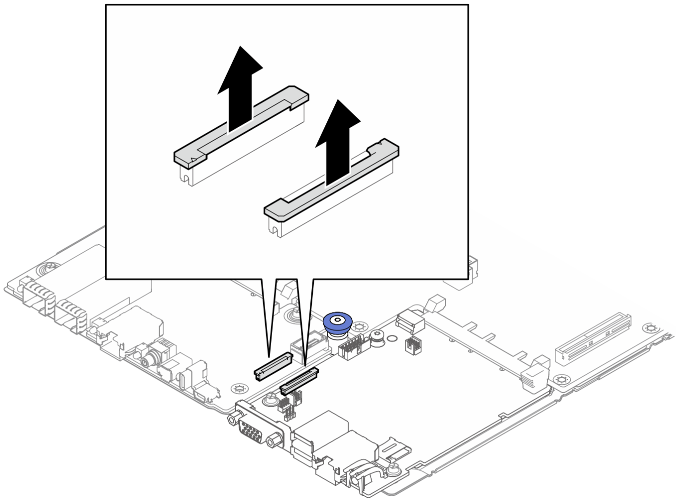


Figure 356. Pulling up connector latches

d. Press the latches to secure the FPC cable to the connectors.

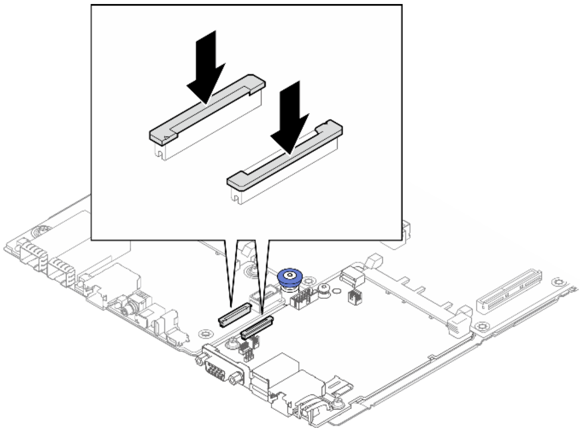


Figure 357. Pressing connector latches

Step 10. A label is attached to the COM port cable. Roll the label around the cable all the way through to prevent label interfering with system connectors and water loop.

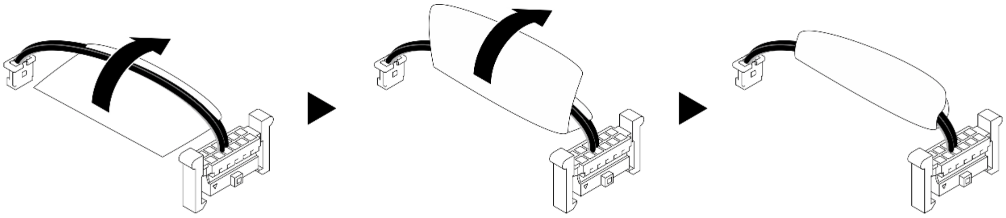


Figure 358. Rolling label around the COM port cable

Step 11. Install the COM port cable to the front I/O board and system I/O board. Place the cable between plunger and serial log connector.

1 Serial log connector on front I/O board	
2 COM port connector on system I/O board	

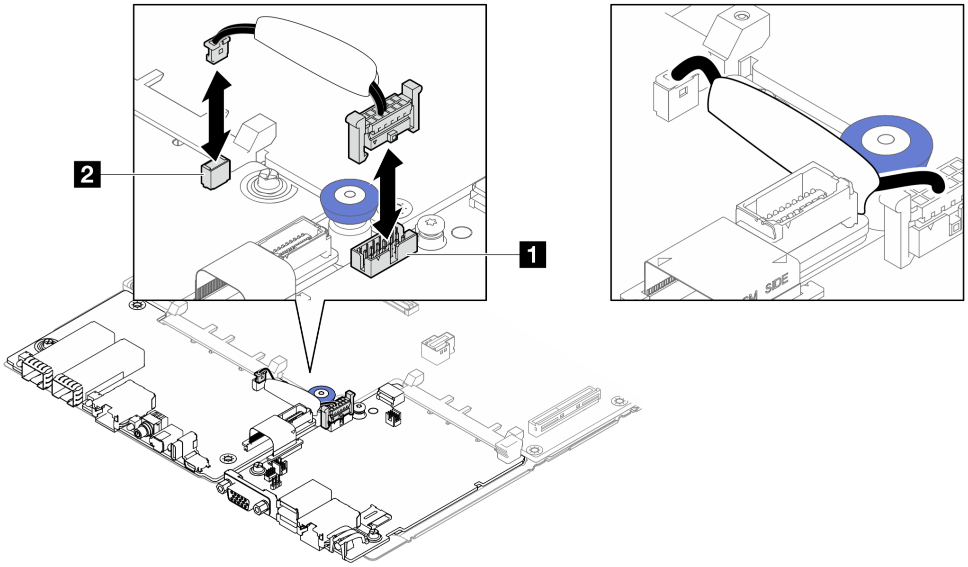


Figure 359. Removing COM port cable

Attention: The COM port cable should be placed between the plunger and the serial log connector.

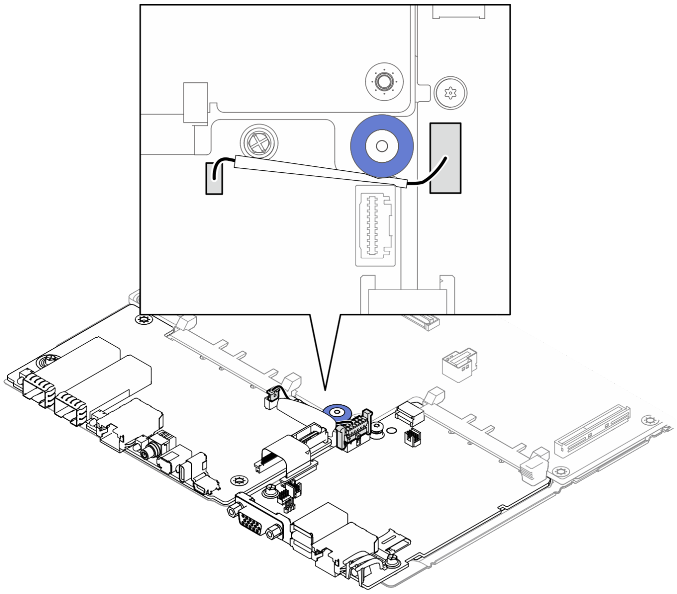


Figure 360. Top view of COM port cable routing

Step 12. Install the system-board assembly to the tray.

Note: Hold the system-board assembly by the thumbscrew in the front and the tab beside the power connector.

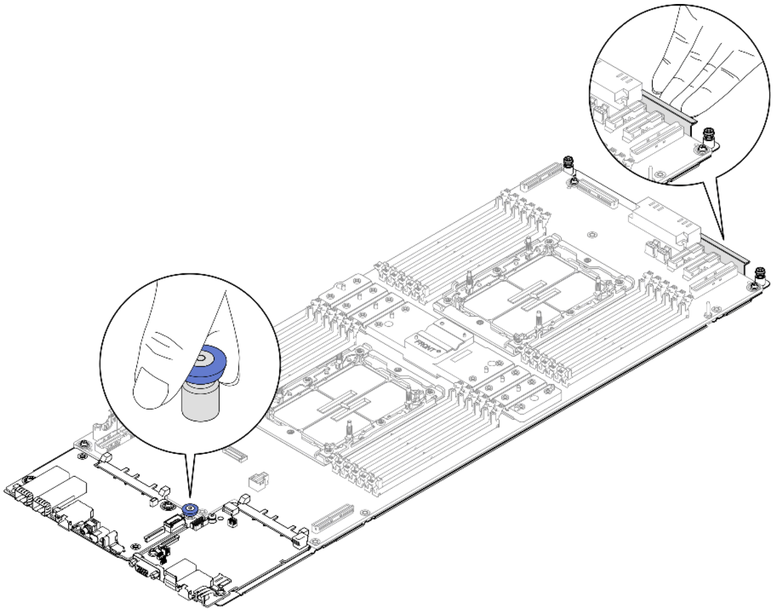


Figure 361. Holding the system-board assembly

a. ❶ Place the system board assembly into the tray.

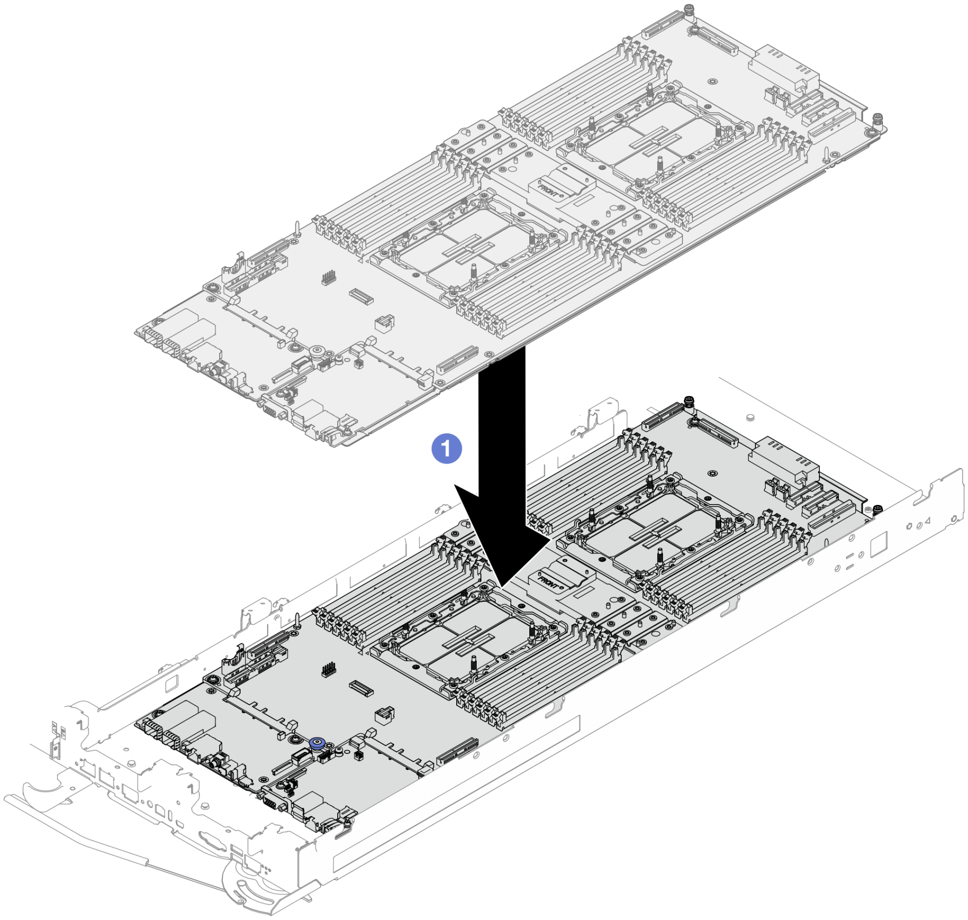


Figure 362. Installing the system-board assembly

b. ② Press the SFP Ethernet ports on the FIO board.

c. ③ While pressing the SFP Ethernet ports, slide the system board assembly forward to secure the front connectors in the corresponding openings on the front bezel.

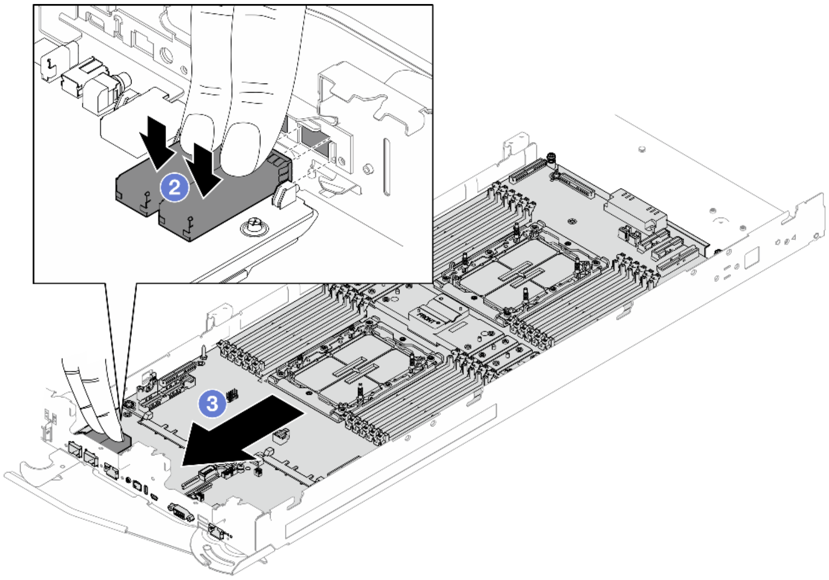


Figure 363. Securing the system board assembly to the tray

Step 13. Make sure the PDB tray handles are rotate to unlock position.

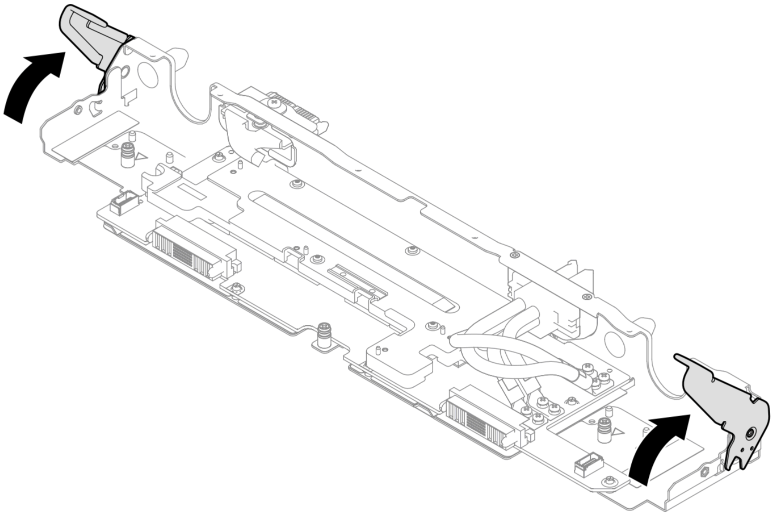


Figure 364. PDB tray handle unlock position

Step 14. Install the PDB tray.

a. ① Align the power connectors on PDB tray to the power connectors to the system boards.

b. ② There are triangle markings on the inside of the right-side and left-side of the tray. Push the PDB tray into the server tray. Stop pushing when the PDB tray meets the triangle markings.

c. ③ Rotate both PDB tray handles **at the same time** to the lock position

Attention: Make sure to rotate both handles at the same time.

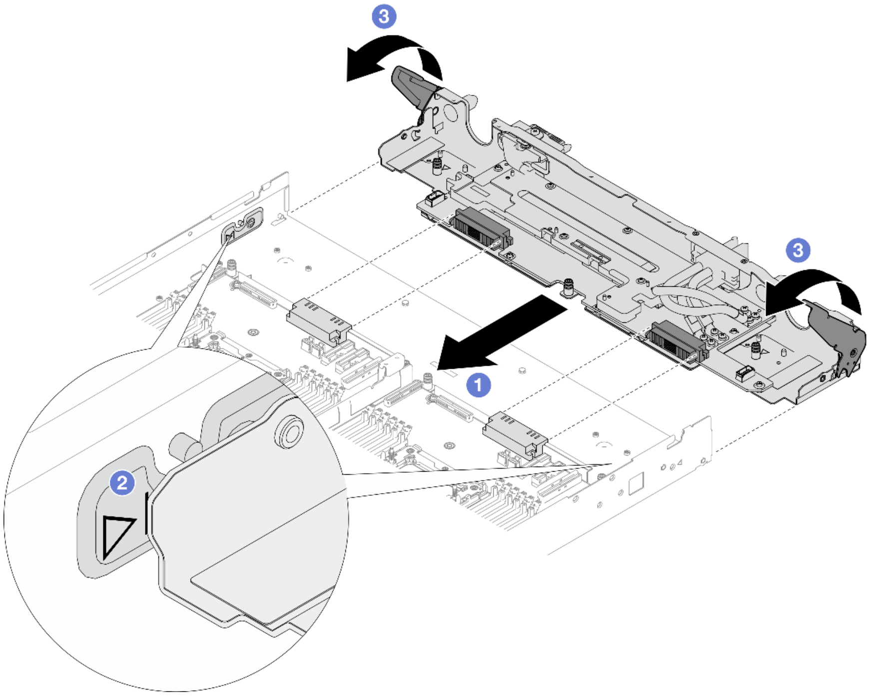


Figure 365. Installing the PDB tray

Step 15. Install two PH1 screws from the outside of the tray.

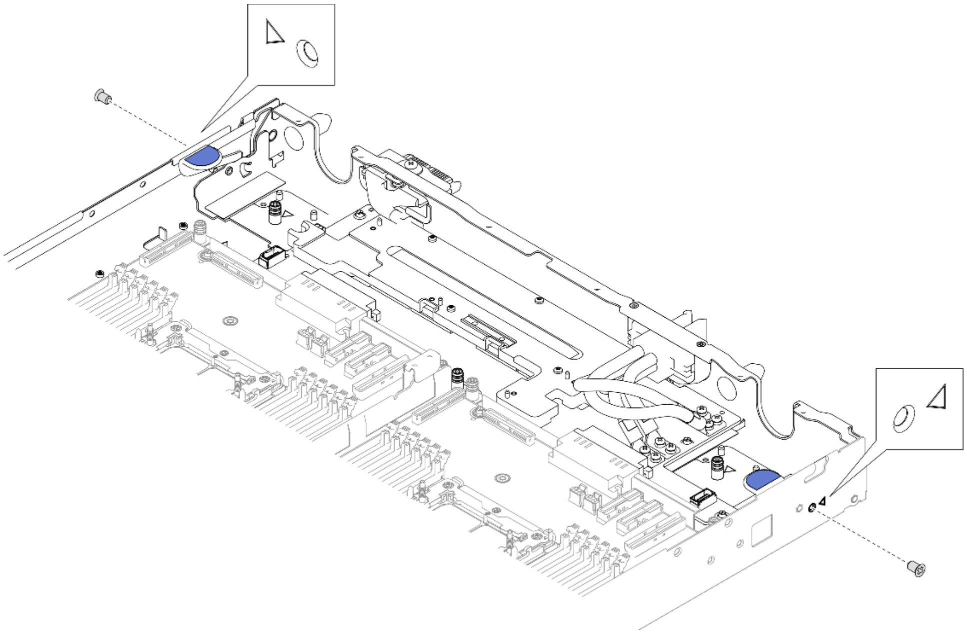


Figure 366. Installing screws from the outside of the tray.

Step 16. Fasten the three PH1 captive screws to install the PDB tray to the server tray.

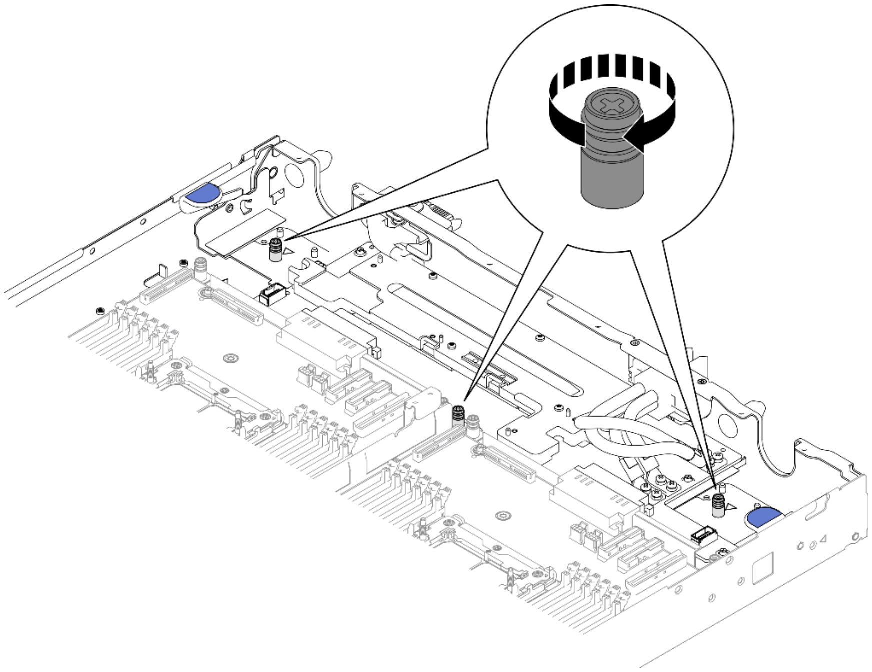


Figure 367. Fastening captive screws

Step 17. Fasten two PH1 captive screws to secure the system-board assembly to the tray.

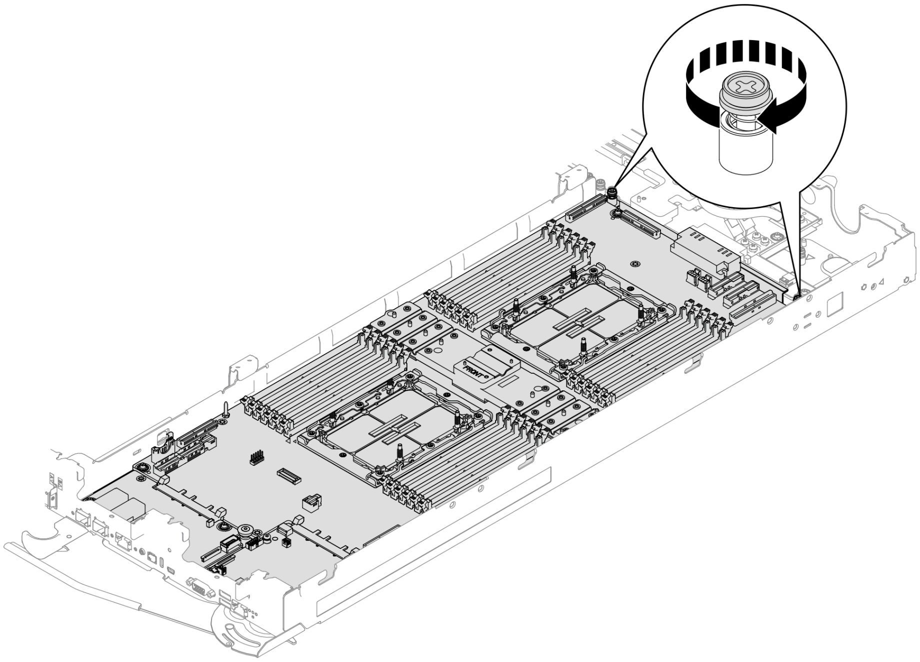


Figure 368. Fastening captive screws on system-board assembly

After you finish

1. Install the water loop. See "Install the water loop" on page 395.
2. **(Optional)** When installing processor board to Node A, install the leakage sensor holder. Place the leakage sensor holder to the tray, and install two screws to secure it to the tray.

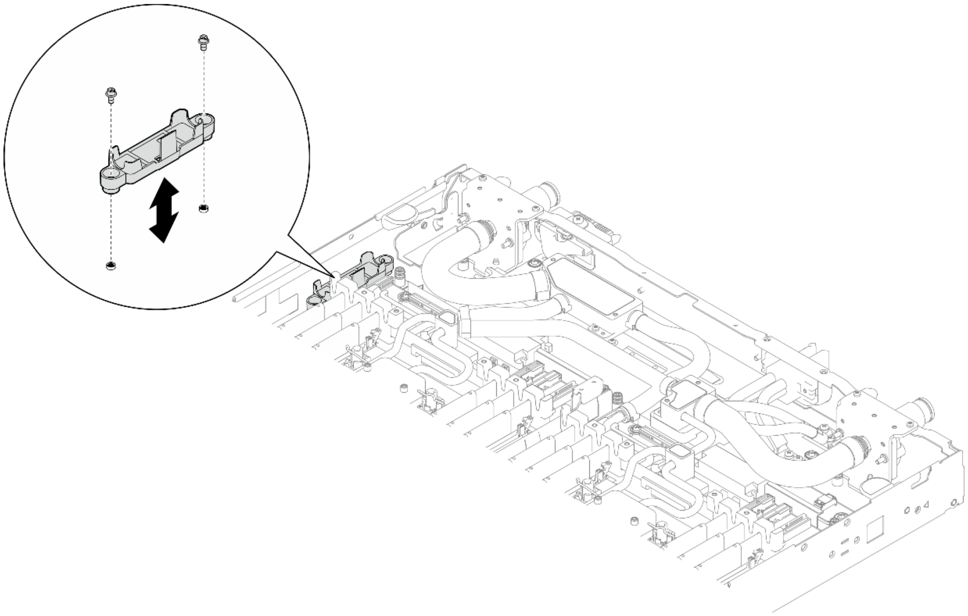


Figure 369. Installing leakage sensor holder

3. Install the leakage sensor. See "Install the leakage sensor" on page 200.
4. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.
5. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
6. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
7. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
8. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
9. Install the cross braces. See "Install the cross braces" on page 109.
10. Install the memory module, perform one of the following.
    - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
    - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
11. Install the DIMM comb. See "Install a DIMM comb" on page 114.
12. Install the tray cover. See "Install the tray cover" on page 373.
13. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
14. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.

15. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

16. Update the vital product data (VPD). See "Update the Vital Product Data (VPD)" on page 303.

Machine type number and serial number can be found on the ID label, see "Identify the solution and access the Lenovo XClarity Controller" on page 27.

Update the Vital Product Data (VPD)

Use this topic to update the Vital Product Data (VPD).

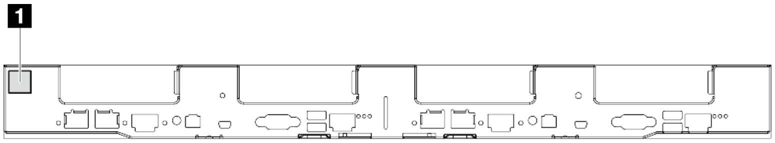
- **(Required)** Machine type
- **(Required)** Serial number
- **(Required)** System model
- (Optional) Asset tag
- (Optional) UUID

Creating node-specific serial number

Do not use the tray serial number when updating the VPD of a newly installed processor board. Instead, you must use the serial number specific to each node when updating VPD. Follow the instructions below to create valid node-specific serial number.

1. Find the tray serial number label on the front of the tray. Note down the tray serial number.

   1 Tray serial number label



2. Position the tray handle on the right-side when viewed from top, as shown in the illustration below.
3. The processor can be installed in location A or location B, specified in illustration below. Identify whether the newly installed processor board is in location A or location B.
4. To create the node-specific serial number, add an "A" or a "B" at the end of the tray serial number, according to the location of the newly installed processor board.

   For example, if the tray serial number is AB12CDEF, and the processor board is installed in location A, the valid node-specific serial number is AB12CDEFA.

   Add B at the end of the tray serial number if processor board is installed in location B.
5. Use the node-specific serial number to update the VPD. Do not use tray serial number in order to prevent errors.

1 Tray handles

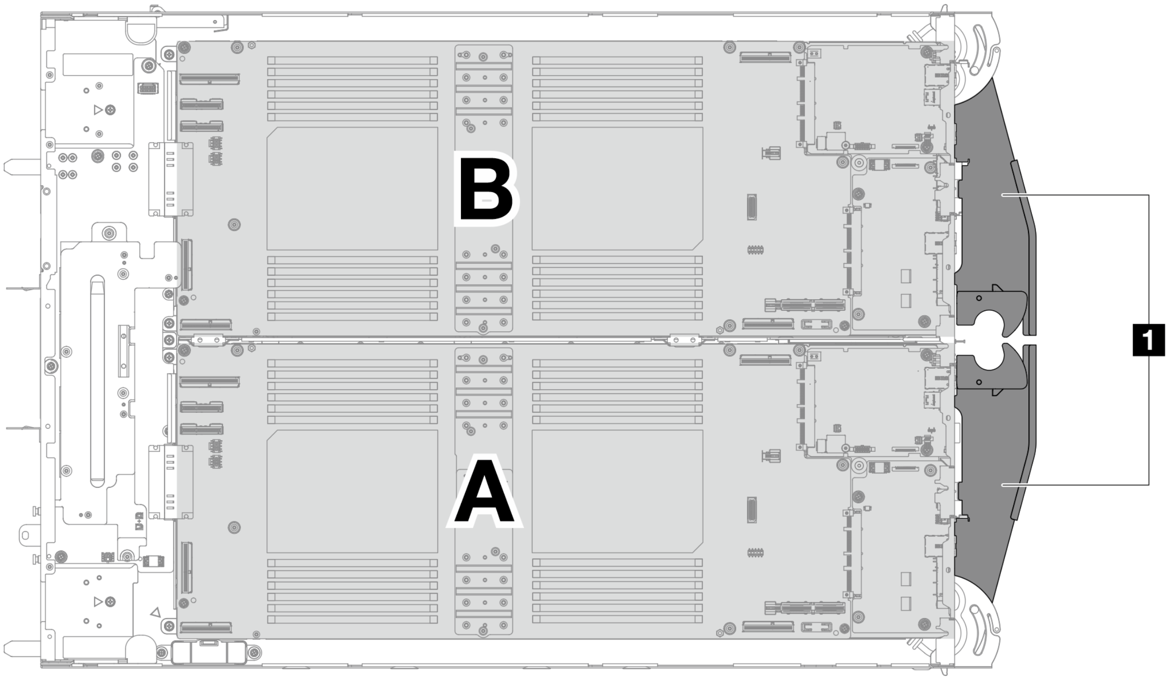


Figure 370. Processor board locations

Recommended tools:

- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Essentials OneCLI commands

Using Lenovo XClarity Provisioning Manager

Steps:

1. Start the server and press the key according to the on-screen instructions. The Lenovo XClarity Provisioning Manager interface is displayed by default.
2. Click ⚙ on the top right corner of the Lenovo XClarity Provisioning Manager main interface.
3. Click **Update VPD**; then, follow on-screen instructions to update the VPD.

Note: Make sure to use node-specific serial number created in "Creating node-specific serial number" on page 303.

Using Lenovo XClarity Essentials OneCLI commands

- Updating **machine type**
  `onecli config set VPD.SysInfoProdName10` *<m/t_model> [access_method]*
- Updating **serial number**
  `onecli config set VPD.SysInfoSerialNum10` *<s/n> [access_method]*

  Note: Make sure to use node-specific serial number created in "Creating node-specific serial number" on page 303.
- Updating **system model**

  `onecli config set VPD.SysInfoProdIdentifier` *<system model>* `[access_method]`

- Updating **asset tag**
  `onecli config set VPD.SysEncloseAssetTag` *<asset_tag> [access_method]*
- Updating **UUID**
  `onecli config createuuid VPD.SysInfoUUID` *[access_method]*

Variable	Description
<m/t_model>	The server machine type and model number. Type `xxxxyyyyyy`, where `xxxx` is the machine type and `yyyyyy` is the server model number.
<s/n>	The serial number on the server. Type `zzzzzzzz` (length 8-10 characters), where `zzzzzzzz` is the serial number.
<system model>	The system model on the server. Type `system yyyyyyyy`, where *yyyyyyyy* is the product identifier.
<asset_tag>	The server asset tag number. Type `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where `aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa` is the asset tag number.
[access_method]	The access method that you select to access the target server. • Online KCS (unauthenticated and user restricted): You can directly delete *[access_method]* from the command. • Online authenticated LAN: In this case, specify below LAN account information at the end of the OneCLI command: `--bmc-username` *<user_id>* `--bmc-password` *<password>* • Remote WAN/LAN: In this case, specify below XCC account information and IP address at the end of the OneCLI command: `--bmc` *<bmc_user_id>*`:`*<bmc_password>*`@`*<bmc_external_IP>* **Notes:** – *<bmc_user_id>* The BMC account name (1 of 12 accounts). The default value is USERID. – *<bmc_password>* The BMC account password (1 of 12 accounts).

System I/O board (DC-SCM) replacement

Use the following procedures to remove and install the system I/O board. System I/O board is also known as Datacenter-ready Secure Control Module (DC-SCM).

Remove the system I/O board (DC-SCM)

Use this information to remove the system I/O board. System I/O board is also known as Datacenter-ready Secure Control Module (DC-SCM).

About this task

Required tools

- Screwdriver for M3 PH1, PH 1, PH 2, T10, and T30 screws

- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- The following illustration might differ slightly from your hardware, but the installation method is the same.
- After replacing the system I/O board, update the firmware to the specific version supported by the server. Make sure that you have the required firmware or a copy of the pre-existing firmware before you proceed.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Backup UEFI and XCC settings.

   a. Perform OneCLI commands or XCC actions to back up the UEFI and XCC settings. See https://pubs.lenovo.com/lxce-onecli/config_backup or https://pubs.lenovo.com/xcc3/nn1ia_c_backupthexcc.

Step 2. Make preparations for this task.

   a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

   b. Remove the tray cover. See "Remove the tray cover" on page 372.

   c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

   d. Remove the memory module, perform one of the following.
      - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
      - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

   e. Remove the cross braces. See "Remove the cross braces" on page 108.

   f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

   g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

   h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see “Remove an E3.S middle drive cage assembly” on page 157.

j. Remove the sideband cable kit. See “Remove the system management sideband cable kit” on page 327.

k. Remove the leakage sensor module. See “Remove the leakage sensor” on page 197.

Step 3. Remove the water loop from the tray. See “Remove the water loop” on page 375.

Step 4. Unfasten three PH1 captive screws on the power distribution board tray (PDB tray).

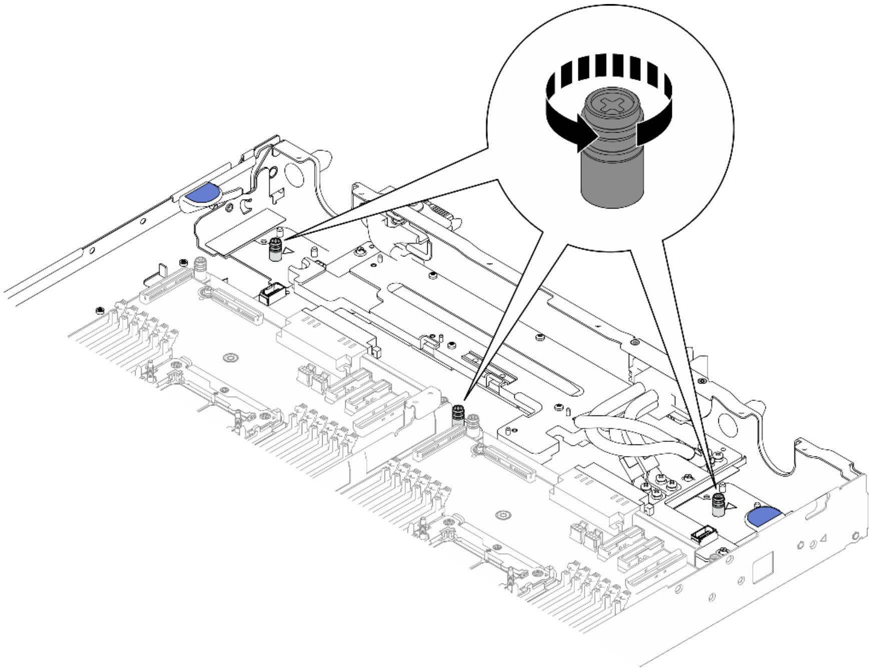


Figure 371. Unfasten three captive screws

Step 5. Remove two PH1 screws from the sides of the tray.

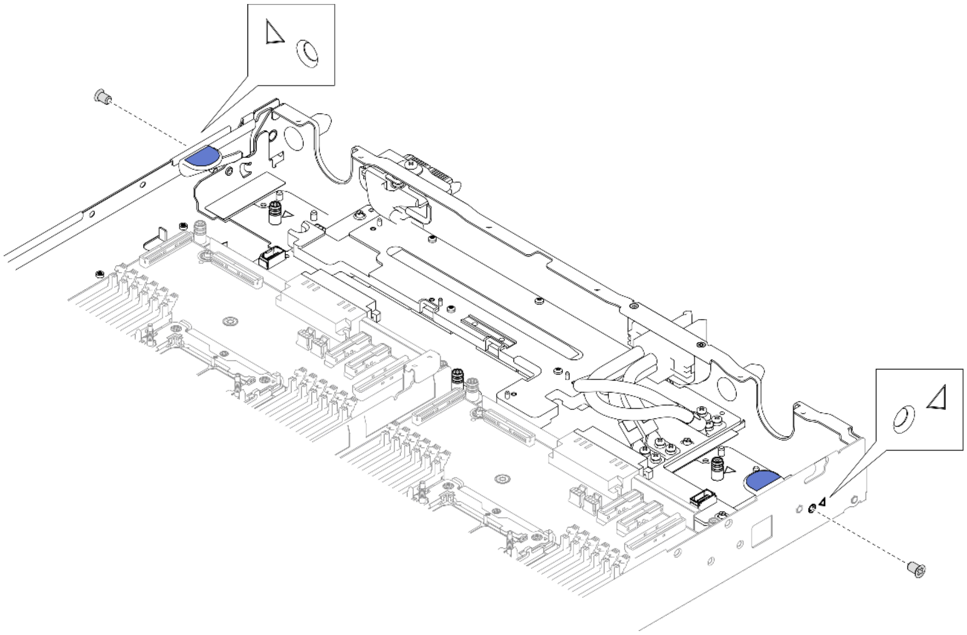
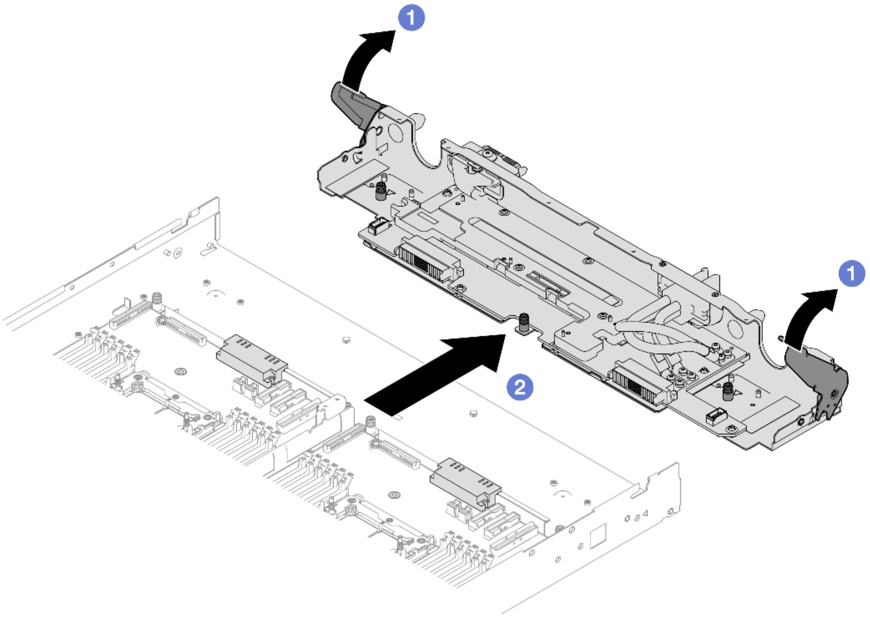


Figure 372. Removing screws from outside of the tray.

Step 6. Remove the power distribution board tray (PDB tray) from the server tray.

a. ① Rotate the tray handles to unlock position.

b. ② Remove the PDB tray from the server tray.



Step 7. Remove the system-board assembly from the tray.

Note: Hold the system-board assembly by the thumbscrew in the front and the tab beside the power connector.

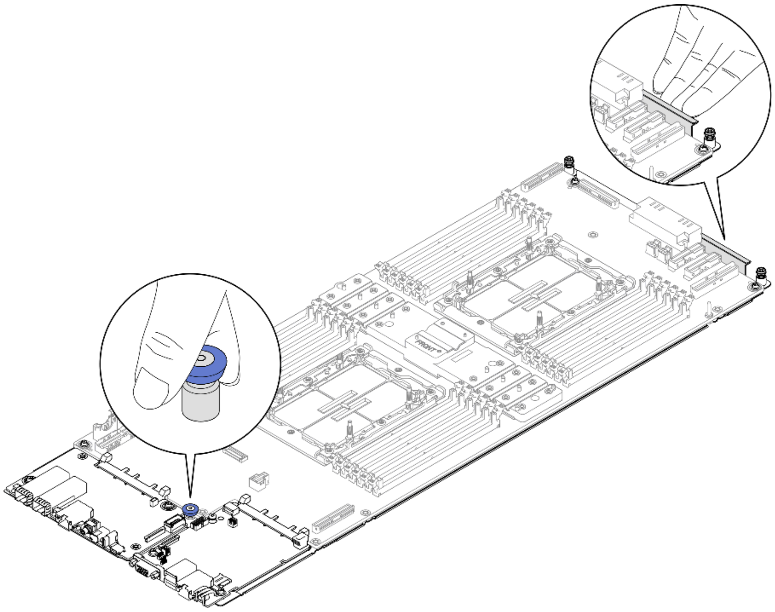


Figure 373. Holding the system-board assembly

a. ① Loosen the two screws in the rear of they system-board assembly.
b. ② Pull up the plunger in the front to release the system-board assembly.
c. ③ Remove the system-board assembly from the tray.

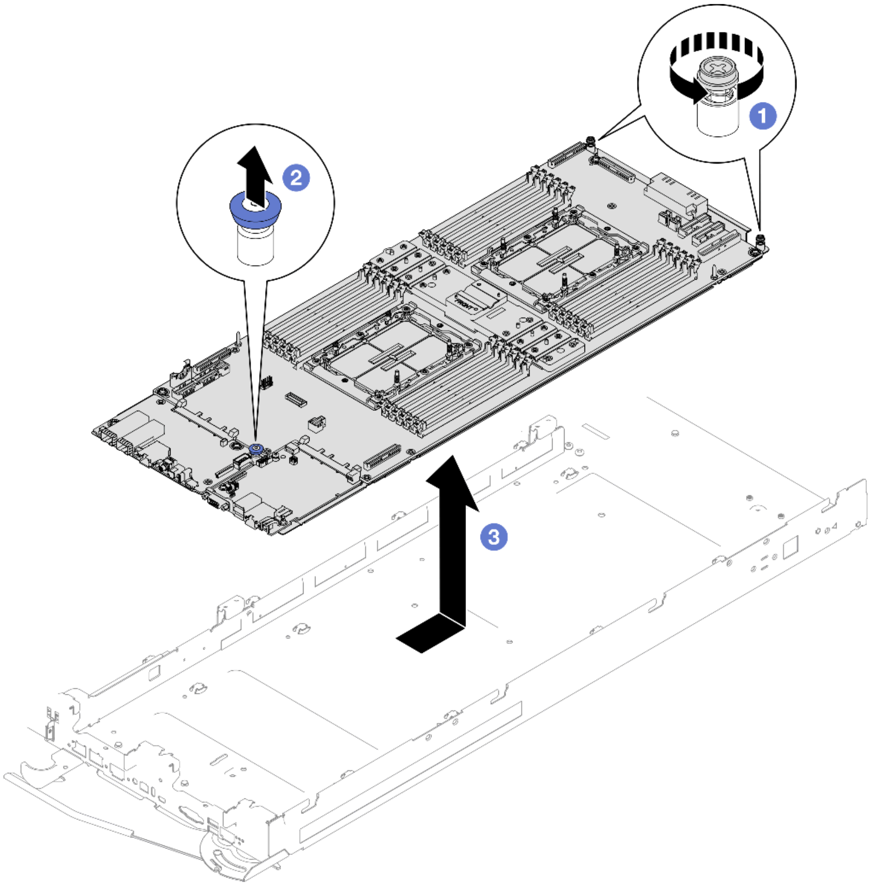


Figure 374. Removing the system-board assembly

Step 8. Disconnect the COM port cable from the front I/O board and the system I/O board.

1 Serial log connector on front I/O board
2 COM port connector on system I/O board

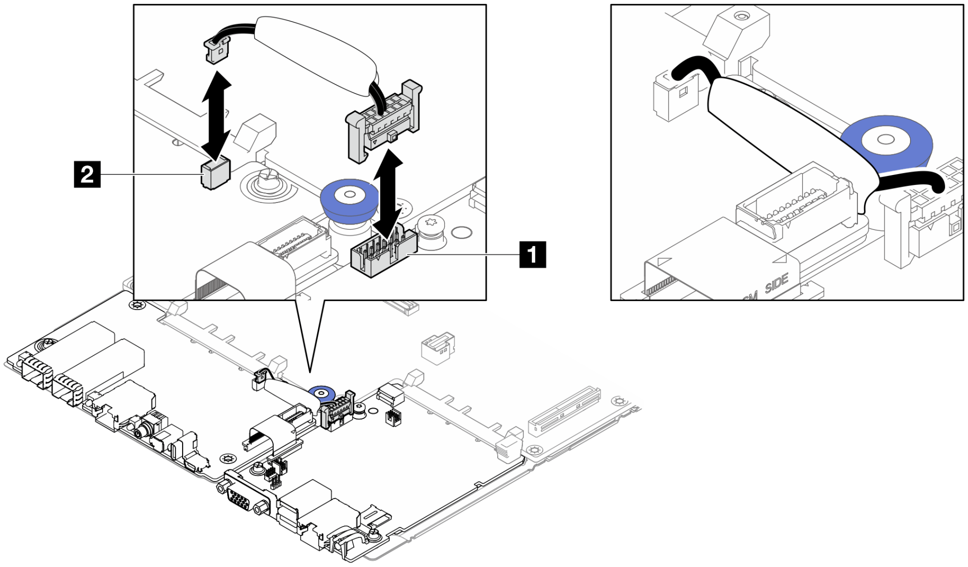


Figure 375. Removing COM port cable

Step 9. Remove the FPC cable.

a. Pull up the latches of the connectors on the front I/O board and the system I/O board.

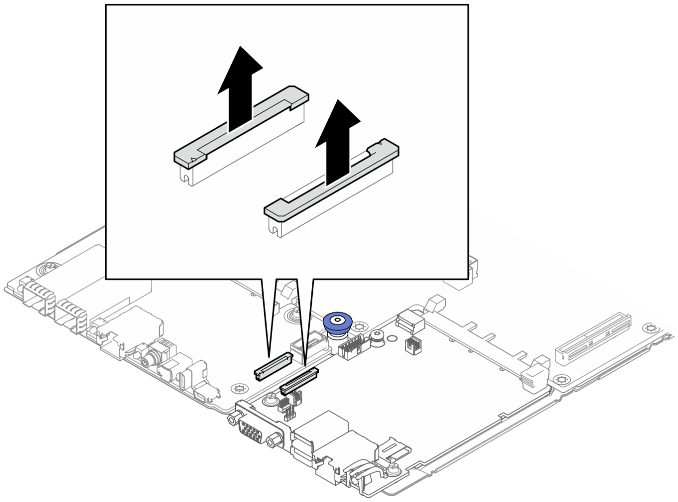


Figure 376. Pulling up connector latches

b. Disconnect the FPC cable from the front I/O board and the system I/O board.

FPC cable connection to FIO board and system I/O board		
From		**To**
FPC cable end marked as FIO SIDE	→	FIO SIDE connector on Front I/O board
FPC cable end marked as SCM SIDE	→	PHY CONN connector on system I/O board

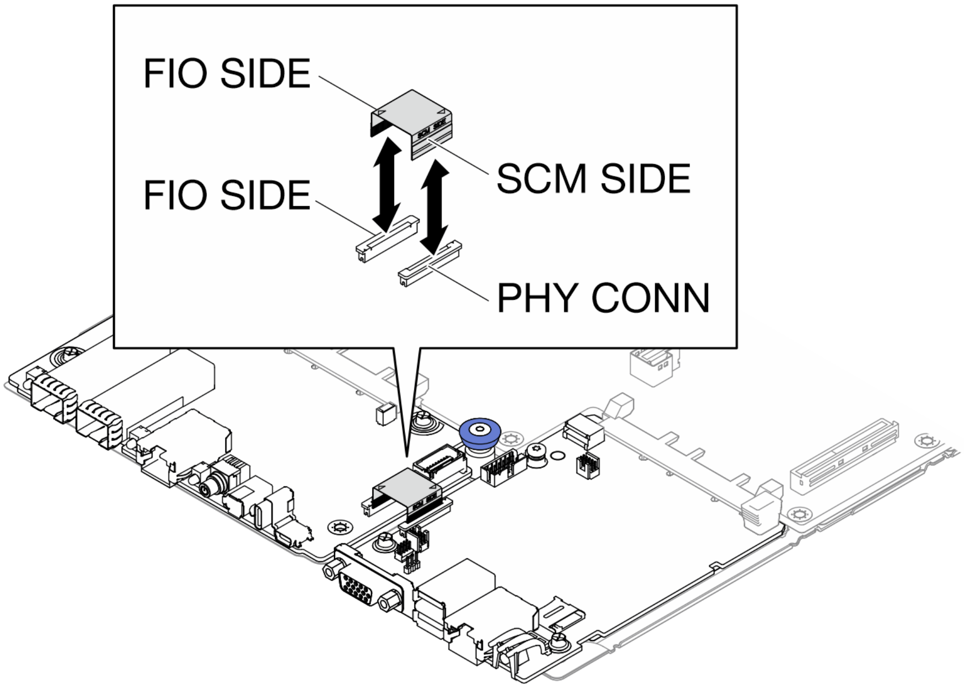


Figure 377. FPC cable connection

Step 10. Remove the system I/O board.

a. ① Remove two M3 PH1 screws from the system I/O board.

b. ② Remove the system I/O board from the system board assembly.

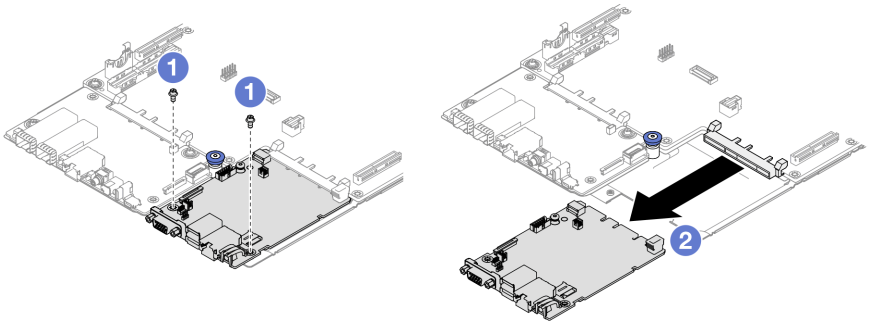


Figure 378. Removing the system I/O board

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the system I/O board (DC-SCM)

Use this information to install the system I/O board. System I/O board is also known as Datacenter-ready Secure Control Module (DC-SCM).

About this task

Required tools

- Screwdriver for M3 PH1, PH 1, PH 2, T10, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Firmware and driver download: You might need to update the firmware or driver after replacing a component.

- Go to https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/ to see the latest firmware and driver updates for your server.
- Go to "Update the firmware" on page 427 for more information on firmware updating tools.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Install the system I/O board.

a. ① Install the system I/O board to the system board assembly.

b. ② Install two M3 PH1 screws to secure the system I/O board to the system board assembly.

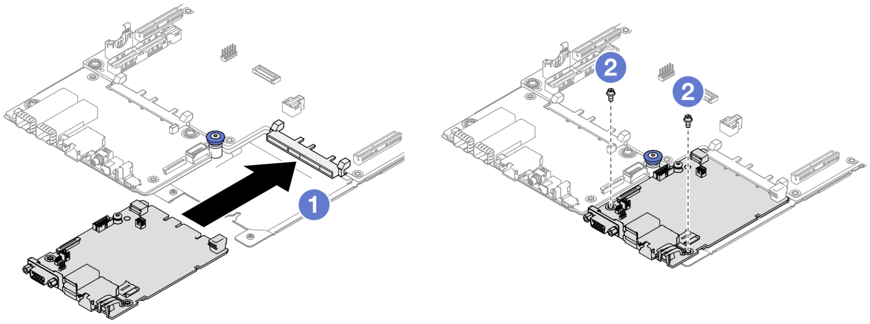


Figure 379. Installing the system I/O board

Step 2. Install the FPC cable to the front I/O board and the system I/O board.

a. Pull up the latch of the connectors on the front I/O board and the system I/O board.

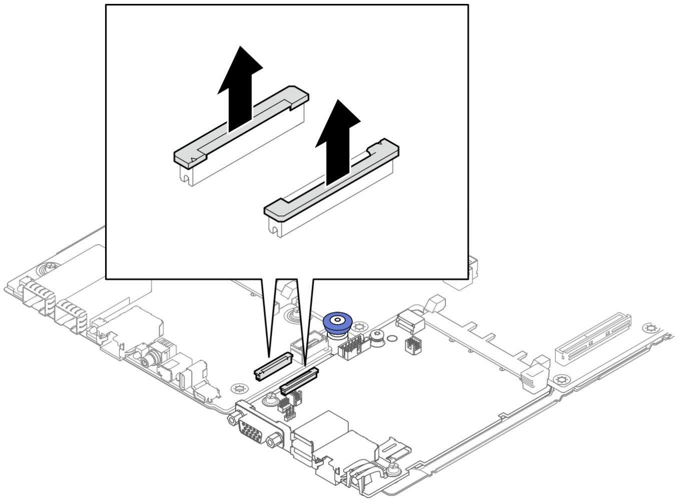


Figure 380. Pulling up connector latches

b. Match the silkscreen on the FPC cable and the connectors. Then, install the FPC cable to the front I/O board and the system I/O board.

FPC cable connection to FIO board and system I/O board		
From		**To**
FPC cable end marked as FIO SIDE	→	FIO SIDE connector on Front I/O board
FPC cable end marked as SCM SIDE	→	PHY CONN connector on system I/O board

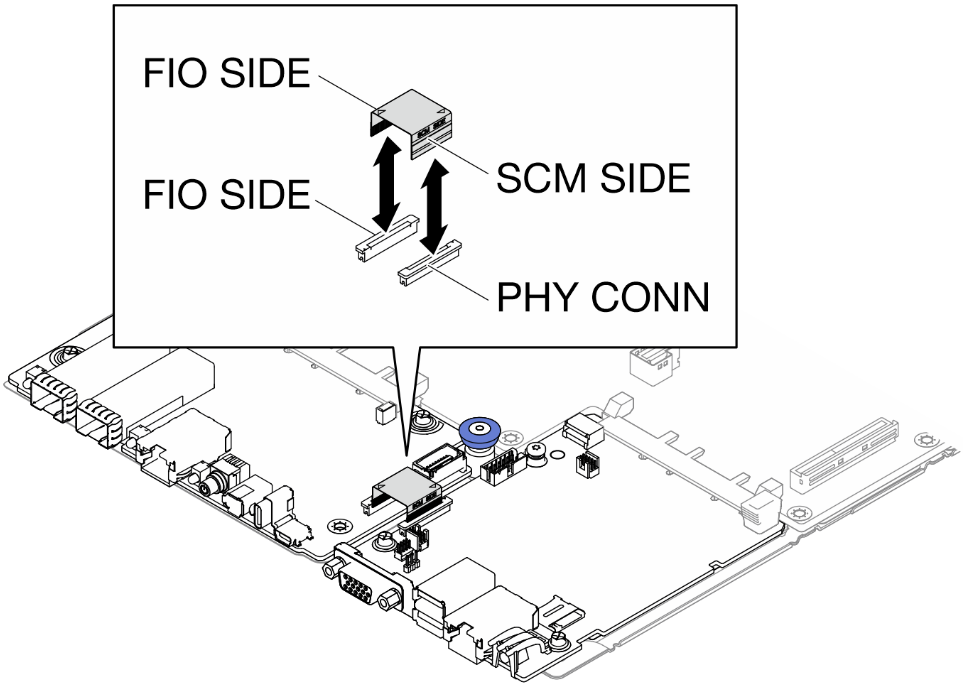


Figure 381. FPC cable connection

c. There is a white line on both ends of the FPC cable. Insert the FPC cable to the connectors until the white lines are invisible. The FPC cable is ***not*** installed correctly if the white lines are visible.

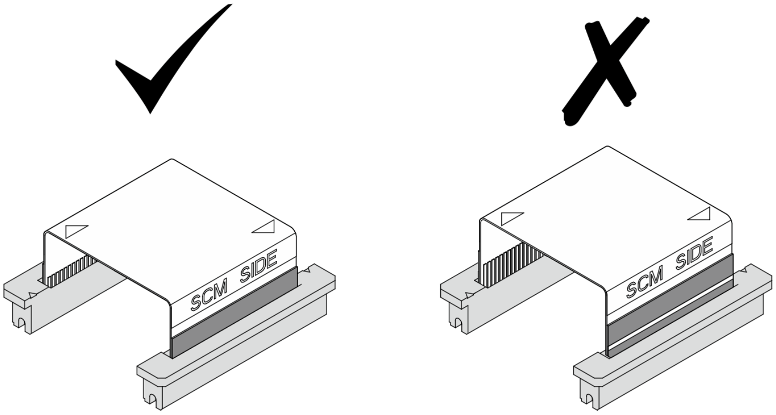


Figure 382. Checking proper FPC cable installation

If the white line is still visible after inserting the FPC cable, check if the connector latches are fully pulled up and loosen.

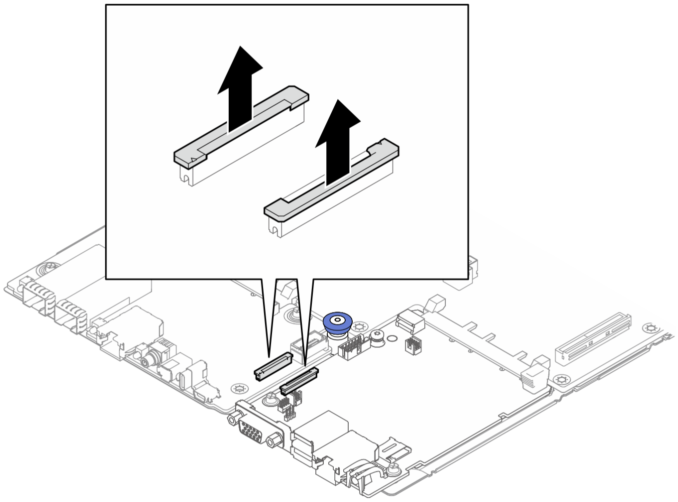


Figure 383. Pulling up connector latches

d. Press the latches to secure the FPC cable to the connectors.

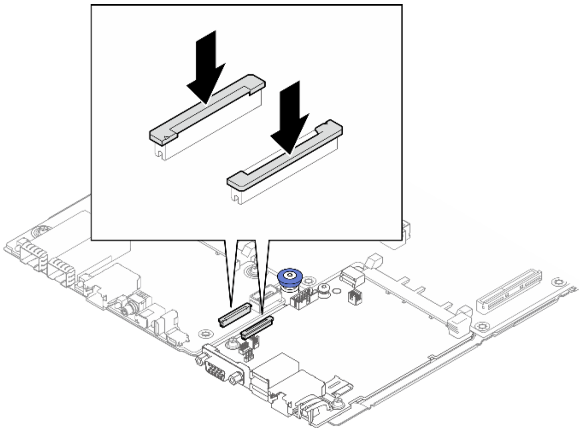


Figure 384. Pressing connector latches

Step 3. A label is attached to the COM port cable. Roll the label around the cable all the way through to prevent label interfering with system connectors and water loop.

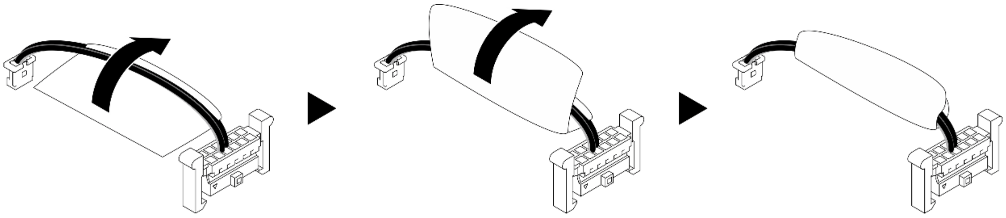


Figure 385. Rolling label around the COM port cable

Step 4. Install the COM port cable to the front I/O board and system I/O board. Place the cable between plunger and serial log connector.

1 Serial log connector on front I/O board
2 COM port connector on system I/O board

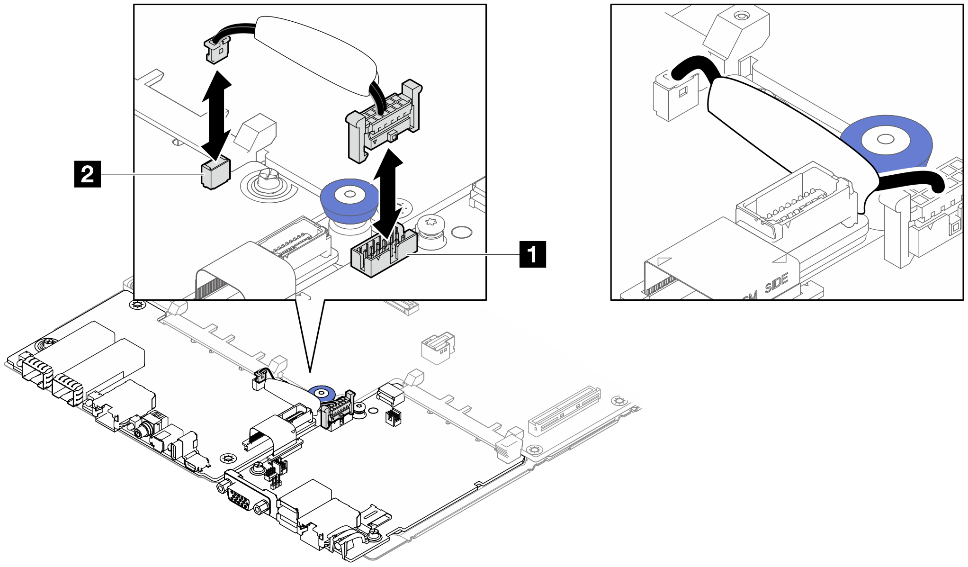


Figure 386. Removing COM port cable

Attention: The COM port cable should be placed between the plunger and the serial log connector.

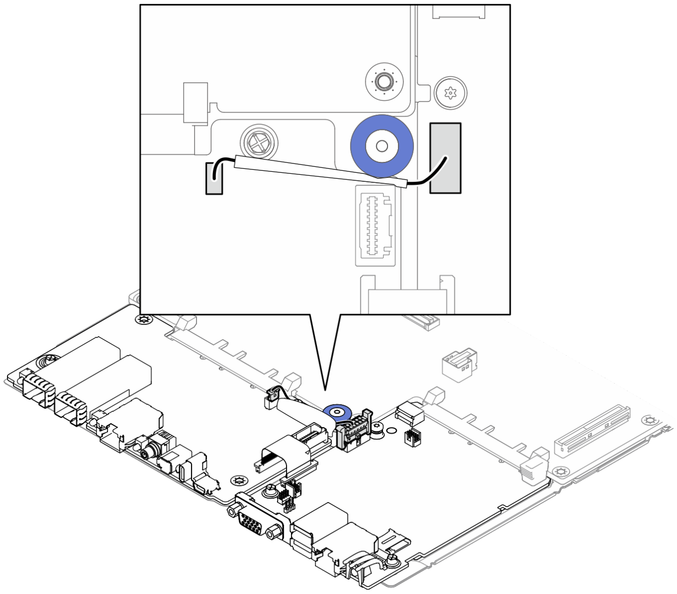


Figure 387. Top view of COM port cable routing

Step 5. Install the system-board assembly to the tray.

Note: Hold the system-board assembly by the thumbscrew in the front and the tab beside the power connector.

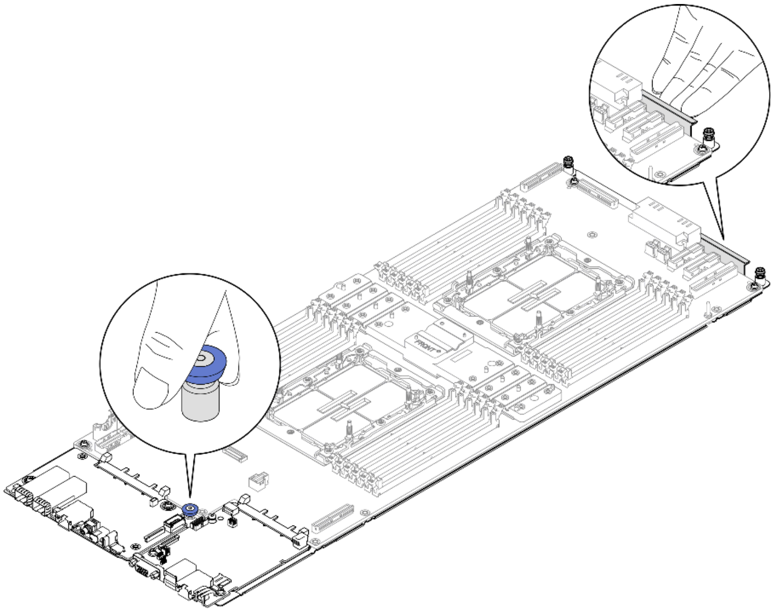


Figure 388. Holding the system-board assembly

a. ❶ Place the system board assembly into the tray.

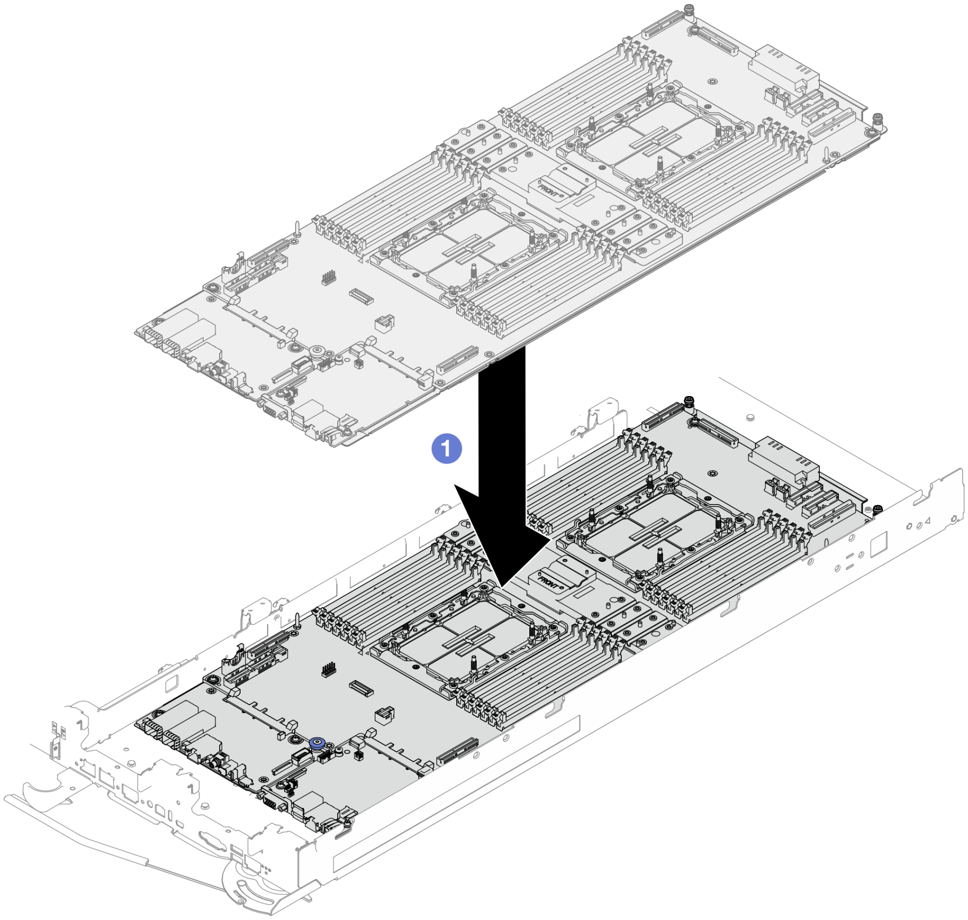


Figure 389. Installing the system-board assembly

b. ② Press the SFP Ethernet ports on the FIO board.

c. ③ While pressing the SFP Ethernet ports, slide the system board assembly forward to secure the front connectors in the corresponding openings on the front bezel.

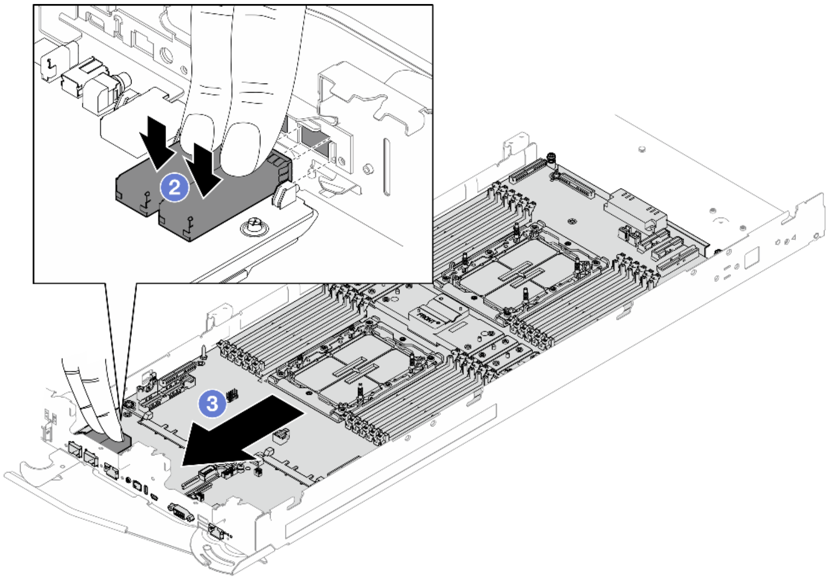


Figure 390. Securing the system board assembly to the tray

Step 6. Make sure the PDB tray handles are rotate to unlock position.

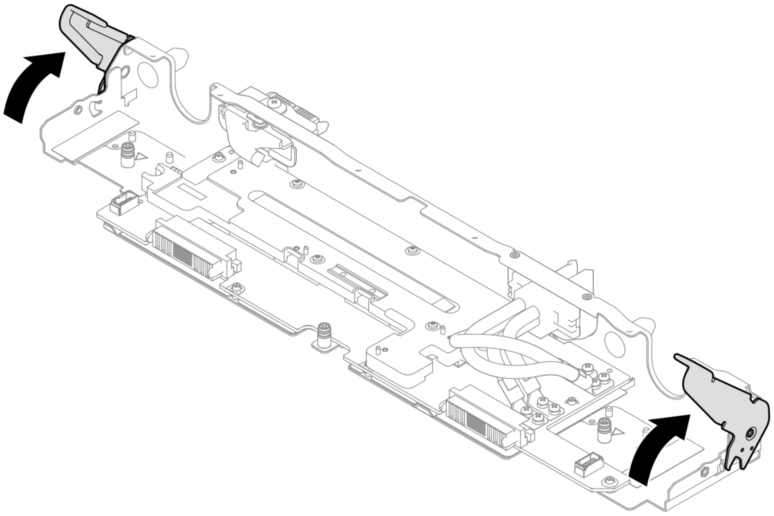


Figure 391. PDB tray handle unlock position

Step 7. Install the PDB tray.

a. ① Align the power connectors on PDB tray to the power connectors to the system boards.

b. ② There are triangle markings on the inside of the right-side and left-side of the tray. Push the PDB tray into the server tray. Stop pushing when the PDB tray meets the triangle markings.

c. ③ Rotate both PDB tray handles **at the same time** to the lock position

Attention: Make sure to rotate both handles at the same time.

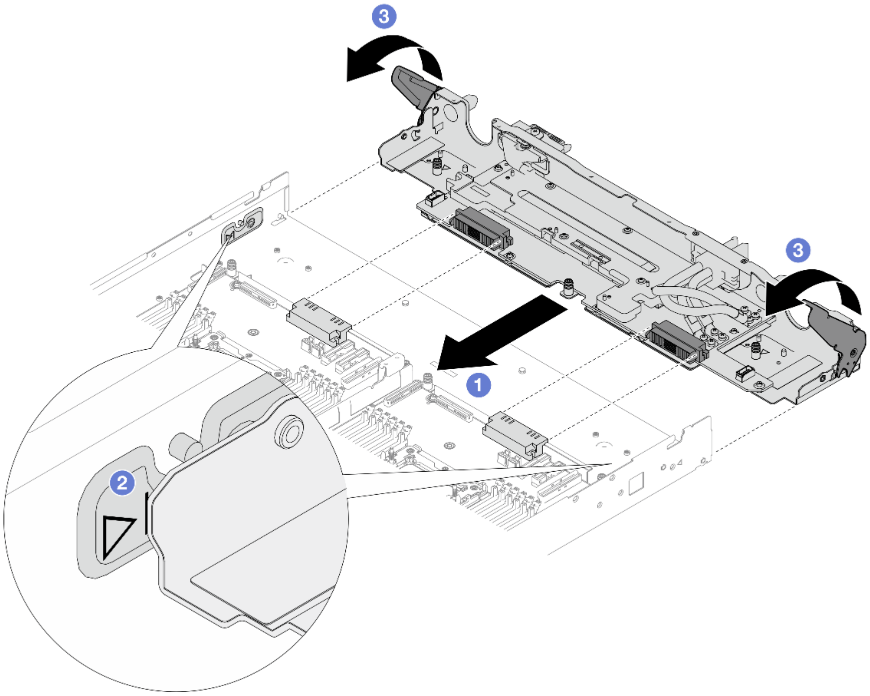


Figure 392. Installing the PDB tray

Step 8. Install two PH1 screws from the outside of the tray.

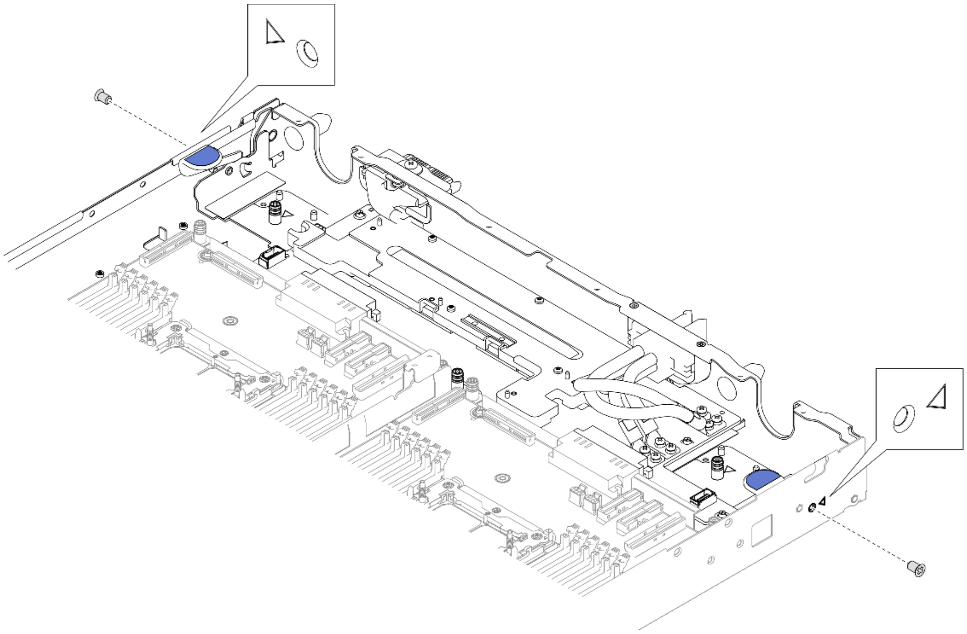


Figure 393. Installing screws from the outside of the tray.

Step 9. Fasten the three PH1 captive screws to install the PDB tray to the server tray.

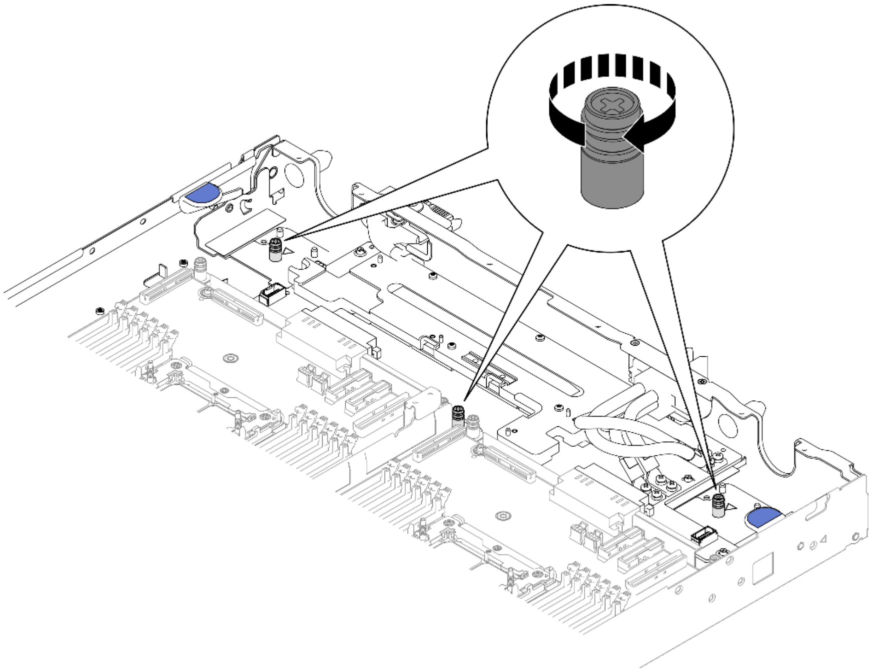


Figure 394. Fastening captive screws

Step 10. Fasten two PH1 captive screws to secure the system-board assembly to the tray.

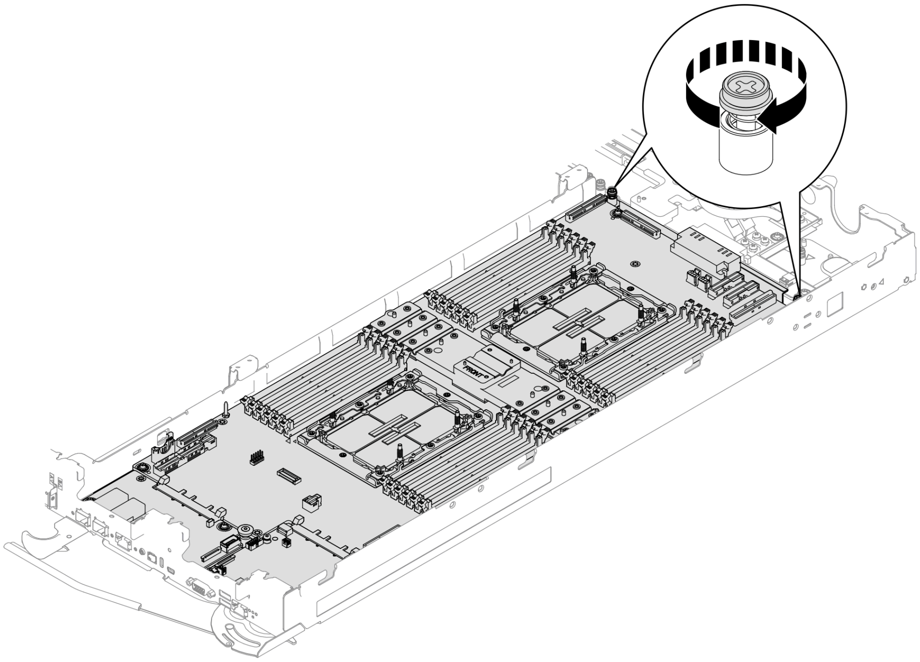


Figure 395. Fastening captive screws on system-board assembly

After you finish

1. Install the water loop. See "Install the water loop" on page 395.
2. Install the leakage sensor. See "Install the leakage sensor" on page 200.
3. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.

4. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
5. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
6. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
7. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
8. Install the cross braces. See "Install the cross braces" on page 109.
9. Install the memory module, perform one of the following.
    - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
    - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
10. Install the DIMM comb. See "Install a DIMM comb" on page 114.
11. Install the tray cover. See "Install the tray cover" on page 373.
12. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
13. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.
14. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.
15. Update the UEFI, XCC and LXPM firmware to the specific version supported by the server. See https://glosse4lenovo.lenovo.com/wiki/glosse4lenovo/view/How%20To/System%20related/Procedure%20for%20replacing%20System%20IO%20board%20%28DC-SCM%29%20and%20updating%20system%20firmware%20on%20V4%20system./.
16. Update the XCC/LXPM/FPGA SCM/LXUM firmware. See "Update the firmware" on page 427.
17. Perform OneCLI commands or XCC actions to restore the UEFI and XCC settings. See https://pubs.lenovo.com/lxce-onecli/onecli_r_restore_command or https://pubs.lenovo.com/xcc3/nn1ia_c_restorethexcc.
18. Set the TPM policy. See "Enable TPM" on page 322.
19. If hiding TPM or updating TPM firmware is needed, see "Hide/observe TPM" on page 324 or "Update the TPM firmware" on page 325.
20. Optionally, enable UEFI Secure Boot. See "Enable UEFI Secure Boot" on page 326.

Enable TPM

The server supports Trusted Platform Module (TPM) of Version 2.0.

Note: For customers in the Chinese Mainland, integrated TPM is not supported. However, customers in the Chinese Mainland can install a TPM adapter (sometimes called a daughter card), only version 2.0 is available.

When a system I/O board is replaced, you must make sure that the TPM policy is set correctly.

CAUTION:
Take special care when setting the TPM policy. If it is not set correctly, the system I/O board can become unusable.

Set the TPM policy

By default, a replacement system I/O board is shipped with the TPM policy set to **Undefined**. You must modify this setting to match the setting that was in place for the system I/O board that is being replaced.

There are two methods available to set the TPM policy:

- From Lenovo XClarity Provisioning Manager

  To set the TPM policy from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key according to the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface.
  2. If the power-on Administrator password is required, enter the password.
  3. Click ⚙ on the top right corner of the Lenovo XClarity Provisioning Manager interface, and then click **Update VPD**.
  4. Set the policy to one of the following settings.
     - **NationZ TPM 2.0 enabled - China only**. Customers in the Chinese Mainland should choose this setting if a NationZ TPM 2.0 adapter is installed.
     - **TPM enabled - ROW**. Customers outside of the Chinese Mainland should choose this setting.
     - **Permanently disabled**. Customers in the Chinese Mainland should use this setting if no TPM adapter is installed.

     Note: Although the setting **Undefined** is available as a policy setting, it should not be used.

- From Lenovo XClarity Essentials OneCLI

  Note: Please note that a Local IPMI user and password must be setup in Lenovo XClarity Controller for remote accessing to the target system.

  To set the TPM policy from Lenovo XClarity Essentials OneCLI:

  1. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked:
     ```
     OneCli.exe config show BMC.TpmTcmPolicyLock --override --bmc <userid>:<password>@<ip_address>
     ```

     Note: The BMC.TpmTcmPolicyLock value must be 'Disabled', which means TPM_TCM_POLICY is NOT locked and changes to the TPM_TCM_POLICY are permitted. If the return code is 'Enabled', no changes to the policy are permitted. The planar may still be used if the desired setting is correct for the system being replaced.
  2. Configure the TPM_TCM_POLICY into XCC:
     - For customers in Chinese Mainland with no TPM, or customers that require to disable TPM:
       ```
       OneCli.exe config set BMC.TpmTcmPolicy "NeitherTpmNorTcm" --override --bmc <userid>:<password>@<ip_address>
       ```
     - For customers in Chinese Mainland that require to enable TPM:
       ```
       OneCli.exe config set BMC.TpmTcmPolicy "NationZTPM20Only" --override --bmc <userid>:<password>@<ip_address>
       ```
     - For customers outside Chinese Mainland that require to enable TPM:
       ```
       OneCli.exe config set BMC.TpmTcmPolicy "TPMOnly" --override --bmc <userid>:<password>@<ip_address>
       ```
  3. Issue the reset command to reset the system:
     ```
     OneCli.exe misc ospower reboot --bmc <userid>:<password>@<ip_address>
     ```
  4. Read back the value to check whether the change has been accepted:
     ```
     OneCli.exe config show BMC.TpmTcmPolicy --override --bmc <userid>:<password>@<ip_address>
     ```

     Notes:

     - If the read back value is matched, it means the TPM_TCM_POLICY has been set correctly.

BMC.TpmTcmPolicy is defined as below:

  - Value 0 uses string "Undefined", which means UNDEFINED policy.
  - Value 1 uses string "NeitherTpmNorTcm", which means TPM_PERM_DISABLED.
  - Value 2 uses string "TPMOnly", which means TPM_ALLOWED.
  - Value 5 uses string "NationZTPM20Only", which means NationZ_TPM20_ALLOWED.
- Below 4 steps must also be used to 'lock' the TPM_TCM_POLICY when using OneCli/ASU commands:

5. Read TpmTcmPolicyLock to check whether the TPM_TCM_POLICY has been locked:

```
OneCli.exe config show BMC.TpmTcmPolicyLock --override --bmc <userid>:<password>@<ip_address>
```

   The value must be 'Disabled', which means TPM_TCM_POLICY is NOT locked and must be set.

6. Lock the TPM_TCM_POLICY:

```
OneCli.exe config set BMC.TpmTcmPolicyLock "Enabled" --override --bmc <userid>:<password>@<ip_address>
```

7. Issue the reset command to reset the system:

```
OneCli.exe misc ospower reboot --bmc <userid>:<password>@<ip_address>
```

   During the reset, UEFI will read the value from BMC.TpmTcmPolicyLock. If the value is 'Enabled' and the BMC.TpmTcmPolicy value is valid, UEFI will lock the TPM_TCM_POLICY setting.

   Note: The valid values for BMC.TpmTcmPolicy include 'NeitherTpmNorTcm', 'TPMOnly', and 'NationZTPM20Only'.

   If the BMC.TpmTcmPolicyLock is set as 'Enabled' but BMC.TpmTcmPolicy value is invalid, UEFI will reject the 'lock' request and change BMC.TpmTcmPolicyLock back to 'Disabled'.

8. Read back the value to check whether the 'Lock' is enabled successfully:

```
OneCli.exe config show BMC.TpmTcmPolicyLock --override --bmc <userid>:<password>@<ip_address>
```

   Note: If the read back value is changed from 'Disabled' to 'Enabled', that means the TPM_TCM_POLICY has been locked successfully. There is no method to unlock a policy once it has been set other than replacing the system I/O board.

   BMC.TpmTcmPolicyLock is defined as below:

   Value 1 uses string "Enabled", which means lock the policy. Other values are not accepted.

Hide/observe TPM

TPM is enabled by default to encrypt data transfer for system operation. Optionally, you can disable TPM using Unified Extensible Firmware Interface (UEFI) or Lenovo XClarity Essentials OneCLI.

Using UEFI

For details, see “TPM Device” in *UEFI User Guide* at https://pubs.lenovo.com/uefi-overview/.

Using Lenovo XClarity Essentials OneCLI

To disable TPM, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

   To download Lenovo XClarity Essentials OneCLI, go to the following site:

   https://datacentersupport.lenovo.com/solutions/HT116433

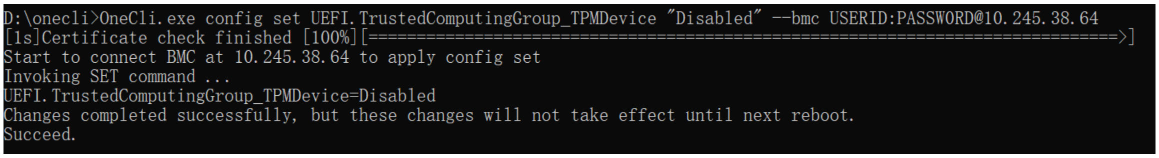
2. Run the following command:

```
OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Disabled" -b <userid>:<password>@<ip_address>
```

   where:

- *<userid>*:*<password>* are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)
- *<ip_address>* is the IP address of the BMC.

Example:

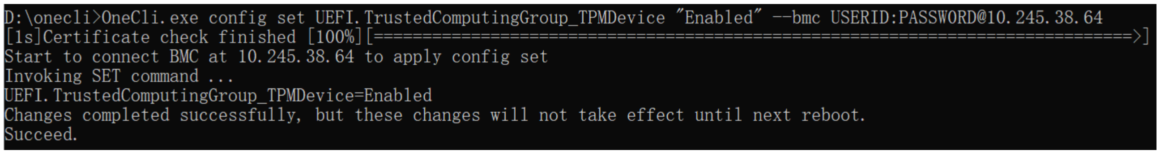


```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Disabled" --bmc USERID:PASSWORD@10.245.38.64
[1s]Certificate check finished [100%][===================================================================================>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Disabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

3. Reboot the system.

If you want to enable TPM again, run the following command and reboot the system:
`OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" -b` *<userid>*`:`*<password>*`@`*<ip_address>*

Example:



```
D:\onecli>OneCli.exe config set UEFI.TrustedComputingGroup_TPMDevice "Enabled" --bmc USERID:PASSWORD@10.245.38.64
[1s]Certificate check finished [100%][===================================================================================>]
Start to connect BMC at 10.245.38.64 to apply config set
Invoking SET command ...
UEFI.TrustedComputingGroup_TPMDevice=Enabled
Changes completed successfully, but these changes will not take effect until next reboot.
Succeed.
```

Update the TPM firmware

Optionally, you can update the TPM firmware using Lenovo XClarity Essentials OneCLI.

Note: TPM firmware update is irreversible. After update, the TPM firmware cannot be downgraded to earlier versions.

TPM firmware version

Follow the procedure below to see the TPM firmware version:

From Lenovo XClarity Provisioning Manager

1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)
2. If the power-on Administrator password is required, enter the password.
3. From the UEFI Setup page, click **System Settings → Security → Trusted Platform Module → TPM 2.0 → TPM Firmware Version**.

Update the TPM firmware

To update the TPM firmware, do the following:

1. Download and install Lenovo XClarity Essentials OneCLI.

   To download Lenovo XClarity Essentials OneCLI, go to the following site:

   https://datacentersupport.lenovo.com/solutions/HT116433

2. Run the following command:
   `OneCli.exe config set UEFI.TrustedComputingGroup_DeviceOperation UpdatetoTPM2_0firmwareversion`*<x_x_x_x>*
   `--bmc` *<userid>*`:`*<password>*`@`*<ip_address>*

   where:

- *<x_x_x_x>* is the target TPM version.

  e.g. TPM 2.0 (7.2.1.0) -> TPM 2.0 (7.2.2.0):

  ```
  OneCli.exe config set UEFI.TrustedComputingGroup_DeviceOperation UpdatetoTPM2_0firmwareversion7_2_2_0
  --bmc <userid>:<password>@<ip_address>
  ```
- *<userid>:<password>* are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o).
- *<ip_address>* is the IP address of the BMC.

Enable UEFI Secure Boot

Optionally, you can enable UEFI Secure Boot.

There are two methods available to enable UEFI Secure Boot:

- From Lenovo XClarity Provisioning Manager

  To enable UEFI Secure Boot from Lenovo XClarity Provisioning Manager:

  1. Start the server and press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)
  2. If the power-on Administrator password is required, enter the password.
  3. From the UEFI Setup page, click **System Settings → Security → Secure Boot Configuration → Secure Boot Setting**.
  4. Enable Secure Boot and save the settings.

  Note: If disabling UEFI secure boot is needed, select Disable in step 4.
- From Lenovo XClarity Essentials OneCLI

  To enable UEFI Secure Boot from Lenovo XClarity Essentials OneCLI:

  1. Download and install Lenovo XClarity Essentials OneCLI.

     To download Lenovo XClarity Essentials OneCLI, go to the following site:

     https://datacentersupport.lenovo.com/solutions/HT116433
  2. Run the following command to enable Secure Boot:

     ```
     OneCli.exe config set UEFI.SecureBootConfiguration_SecureBootSetting Enabled --bmc
     <userid>:<password>@<ip_address>
     ```

     where:

     – *<userid>:<password>* are the credentials used to access the BMC (Lenovo XClarity Controller interface) of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o)

     – *<ip_address>* is the IP address of the BMC.

     For more information about the Lenovo XClarity Essentials OneCLI `set` command, see:

     https://pubs.lenovo.com/lxce-onecli/onecli_r_set_command

  Note: If disabling UEFI secure boot is needed, run the following command:

  ```
  OneCli.exe config set UEFI.SecureBootConfiguration_SecureBootSetting Disabled --bmc <userid>:<password>@<ip_
  address>
  ```

Reset the UEFI password

Use this topic to reset the UEFI password after replacing the system I/O board.

Recommended tool:

- Lenovo XClarity Essentials OneCLI commands

Using Lenovo XClarity Essentials OneCLI commands

1. Clear the UEFI password.
    - To clear the power-on password, run the following command:

      `OneCli.exe config set IMM.UefiPowerOnPassword "" -imm` *<userid>*`:`*<password>*`@`*<ip_address>*
    - To clear the admin password, run the following command:
      `OneCli.exe config set IMM.UefiAdminPassword "" -imm` *<userid>*`:`*<password>*`@`*<ip_address>*
2. Set a new UEFI password.
    - To set a new power-on password, run the following command:
      `OneCli.exe config set IMM.UefiPowerOnPassword "`*<new_password>*`" -imm` *<userid>*`:`*<password>*`@`*<ip_address>*
    - To set a new admin password, run the following command:
      `OneCli.exe config set IMM.UefiAdminPassword "`*<new_password>*`" -imm` *<userid>*`:`*<password>*`@`*<ip_address>*

where:

- *<userid>*:*<password>* are the credentials used to access the Lenovo XClarity Controller interface of your server. The default user ID is USERID, and the default password is PASSW0RD (zero, not an uppercase o).
- *<ip_address>* is the IP address of the Lenovo XClarity Controller.
- *<new_password>* is the new password that you need to set.

System management sideband cable kit replacement

Use the following procedures to remove and install the system management sideband cable kit.

Remove the system management sideband cable kit

Use this information to remove the system management sideband cable kit.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect the power cords and all external cables from the enclosure.
- Disconnect the power cords from the enclosure.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See “Remove the tray cover” on page 372.

c. Remove the cross braces. See “Remove the cross braces” on page 108.

d. Remove the front E3.S drive cage. see “Remove an E3.S front drive cage assembly” on page 121.

e. When replacing the sideband cable with a new one, and there is a ferrite core attached to it, remove the ferrite core. Keep the ferrite core for future use. See “Remove the ferrite core” on page 171.

Step 2. Disconnect the system management sideband cables from the system boards, see ***Internal Cable Routing Guide***.

Step 3. Remove the system management sideband cable kit.

a. ❶ Remove three M3 PH1 screws from the tray rear bezel.

b. ❷ Remove the system management sideband cable kit.

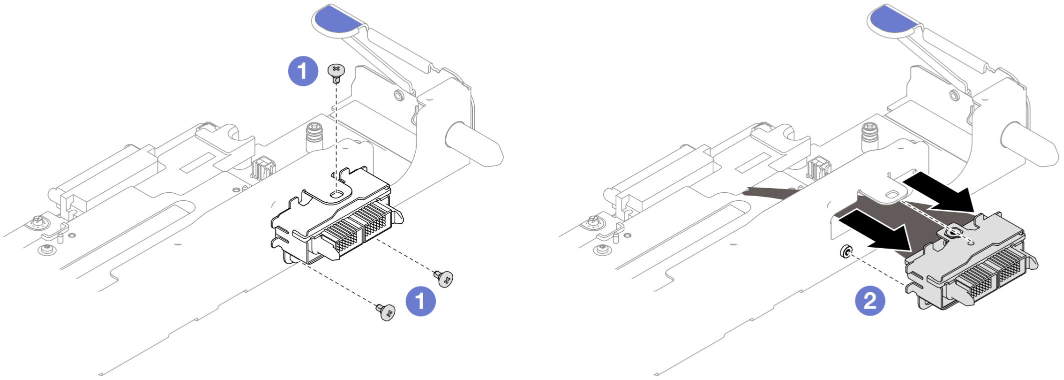


Figure 396. Removing the system management sideband cable kit

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the system management sideband cable kit

Use this information to install the system management sideband cable kit.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. A water loop quick connect is next to the sideband cable slot. Move the quick connect away to allow space for operation.

a. ❶ Remove the four screws from the quick connect.

b. ② Lift the quick connect and place it aside.

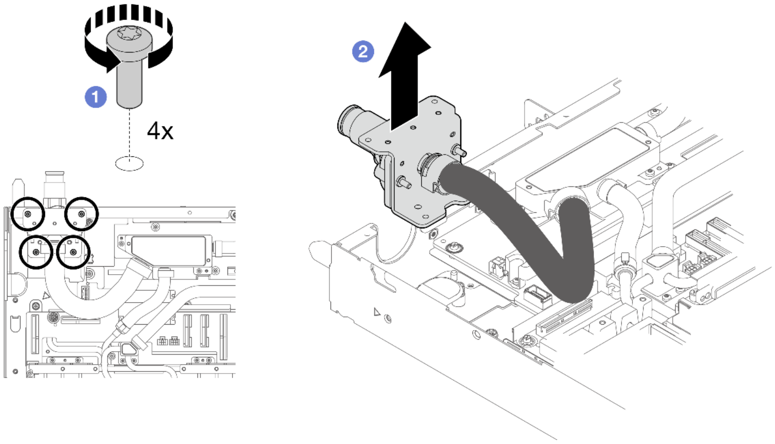


Figure 397. Lifting the quick connect

Step 2. Install the system management sideband cable kit.

a. ① Install the system management sideband cable kit into the opening on the tray rear bezel.

b. ② Install three M3 PH1 screws on the rear tray bezel.

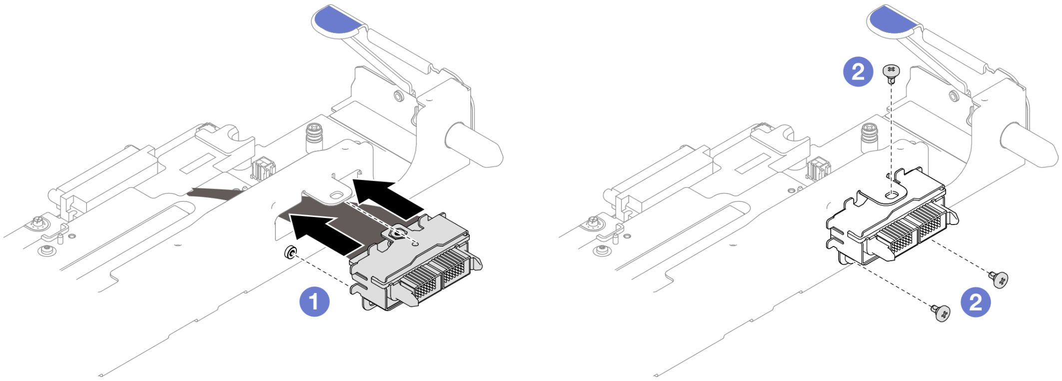


Figure 398. Installing system management sideband cable kit

Step 3. Reinstall the quick connect back to the tray.

a. ① Place the quick connect to the tray.

b. ② Install the four screws to secure the quick connect to the tray.

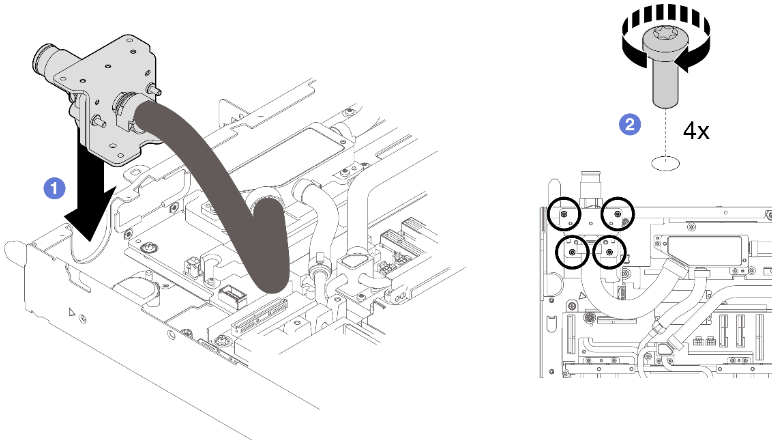


Figure 399. Installing the quick connect

Note: To prevent damaging the cable, make sure to hold down the cables near the sideband module when routing the sideband cables through the water loop.

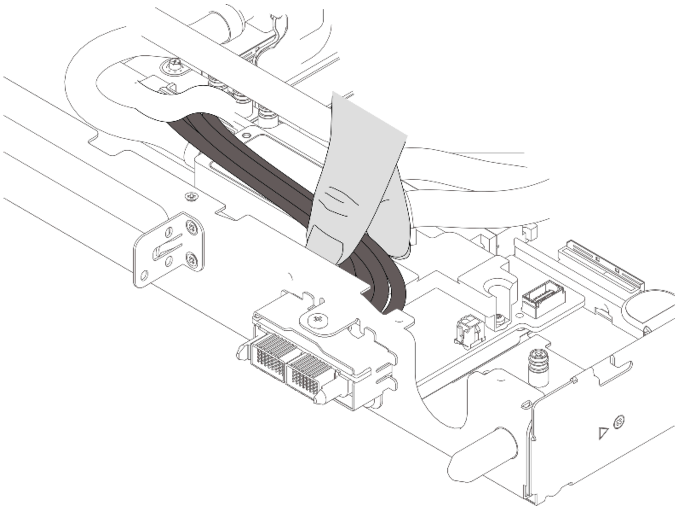


Figure 400. Holding down sideband cables

After you finish

1. If a ferrite core was removed when removing the defect sideband cable, re-attach the ferrite core to the new sideband cable. See "Install the ferrite core" on page 172.
2. Connect the system management sideband cables to the system boards, see ***Internal Cable Routing Guide***.
3. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
4. Install the cross braces. See "Install the cross braces" on page 109.
5. Install the tray cover. See "Install the tray cover" on page 373.
6. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
7. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.

8. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see “PCIe adapter cable routing” in *SC750 V4 Cable Routing Guide*.

Tray replacement

Use the following procedures to remove and install a DWC tray.

Remove a tray from the enclosure

Use this information to remove a DWC tray from the enclosure.

About this task

Attention: For safety reasons, when removing a tray or a PCS, it is highly recommended to use the Genie® Lift™ GL™-8 due to the server's weight. Lenovo offers the lift with add on fixtures Genie Lift GL-8 Option Kit and GL-8 Kit for N1380 and SC Systems. If no lift tool is available on-site, customers must move the machine to an accessible, powered area before the trained technician arrives and handles reinstallation. Lenovo strongly advises configuring a complete solution for N1380 and SC-Systems with the lift tool and its add-on features via non-racked items.

Important: Mandatory tools for tray removal and installation.

- Lift tool assembly
  - Genie GL-8 lift tool installed with the lift tool fixture. The foot-release brake should also be attached to the lift tool.
  - For assembling instructions, see "Setting up the lift tool assembly" on page 50
- Rotate fixture cart assembly
  - Rotate fixture installed on the customized cart.
  - For assembling instructions, see "Setting up the rotate fixture cart assembly" on page 54
- For mandatory tools ordering information, see https://serveroption.lenovo.com/.

Attention: DO NOT put your hands on the support bars in order to prevent injury.

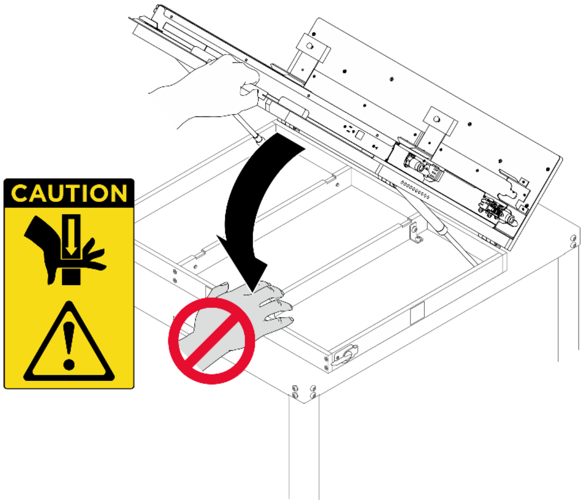


Figure 401. Avoid placing hands on the support bars

S040

CAUTION:
Protective gloves should be worn for this procedure.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- The following illustration might differ slightly from your hardware, but the removal method is the same.

Notes: Server and switch cable are routed through the cable retainers on the bottom front support bracket.

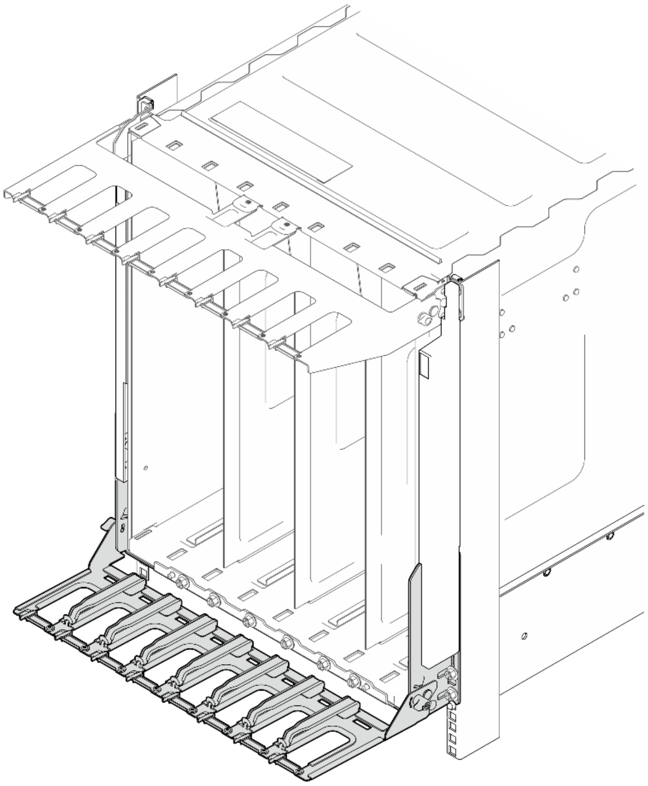
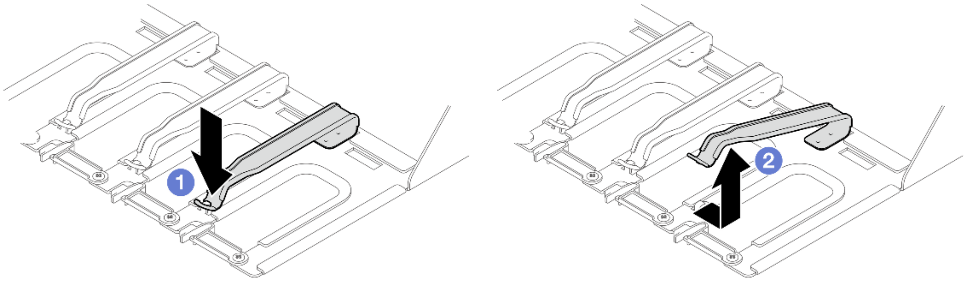
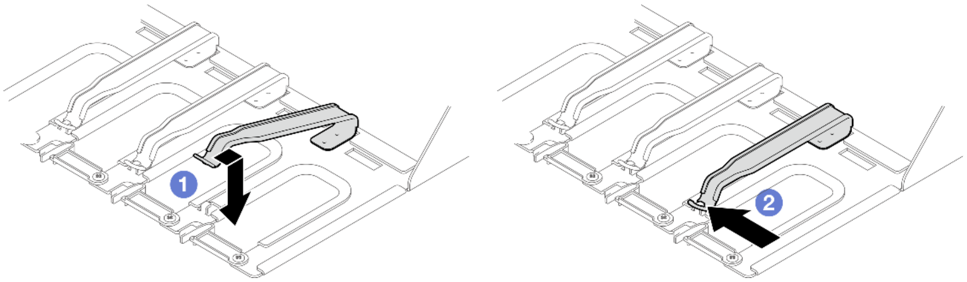


Figure 402. Bottom support bracket

1. Opening the cable retainer
    - ❶ Press down the cable retainer.
    - ❷ Pull the cable retainer to the right; then, pull it up.



2. Closing the cable retainer
    - ❶ Pull the cable retainer to the right; then, press it down.
    - ❷ Pull the cable retainer to the left to secure it to the support bracket.



Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: S040

CAUTION:
Protective gloves should be worn for this procedure.

The tray might be very hot. Wait several minutes to let the tray cool before removing the tray cover.

Step 1. Remove the tray from the enclosure.

a. ① Press the latches on the front cam handles.

b. ② Rotate the front cam handles as shown in the illustration. The tray moves out of the tray bay approximately 2 cm (0.78 inch).

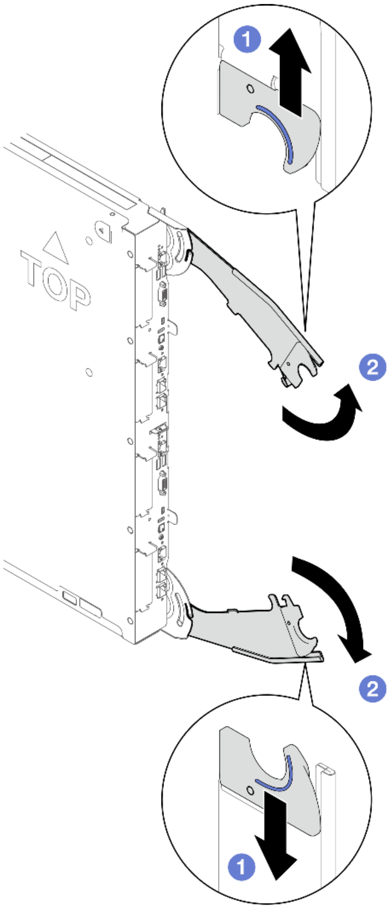


Figure 403. Opening the tray cam handles

c. ③ Grab the cam handles and pull the DWC tray slightly out of the enclosure.

d. ④ Pull the tray out until you see the **TOP** printing on the top cover. Then, close the cam handles.

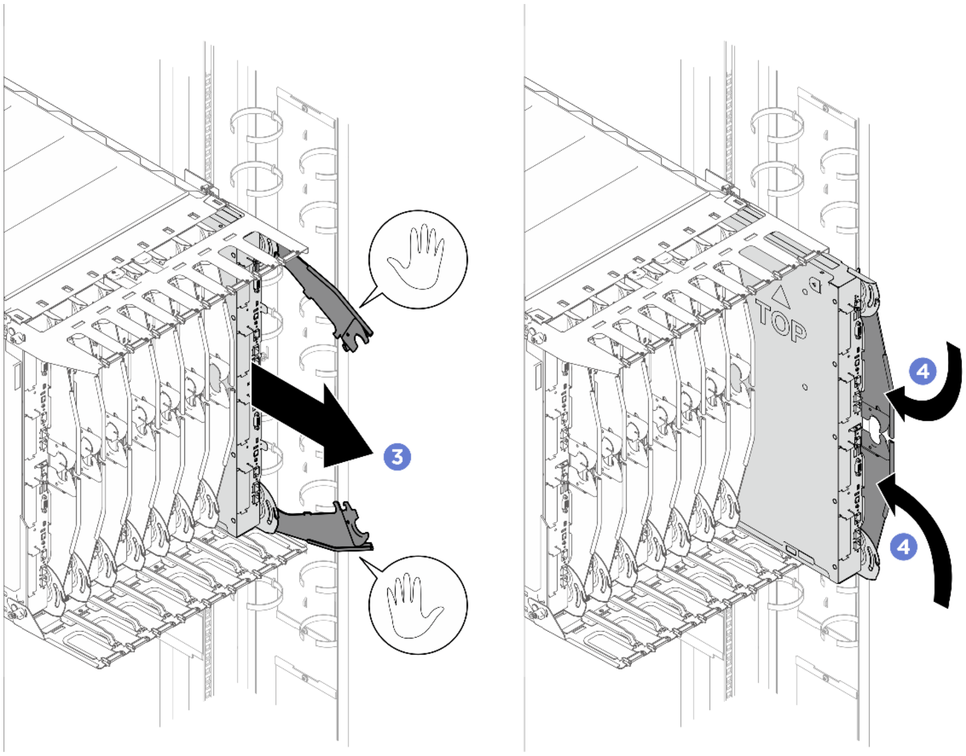


Figure 404. Pulling the tray slightly out of the enclosure

Step 2. Adjust the fixture guide fence to the **SW** position (Single Wide). If the guide fence is not in **SW** position, lift the guide fence, and re-install it to the **SW** slots.

Fence label description	**Full description**
SW	Single Wide
PCS	Power Conversion Station
DW	Double Wide

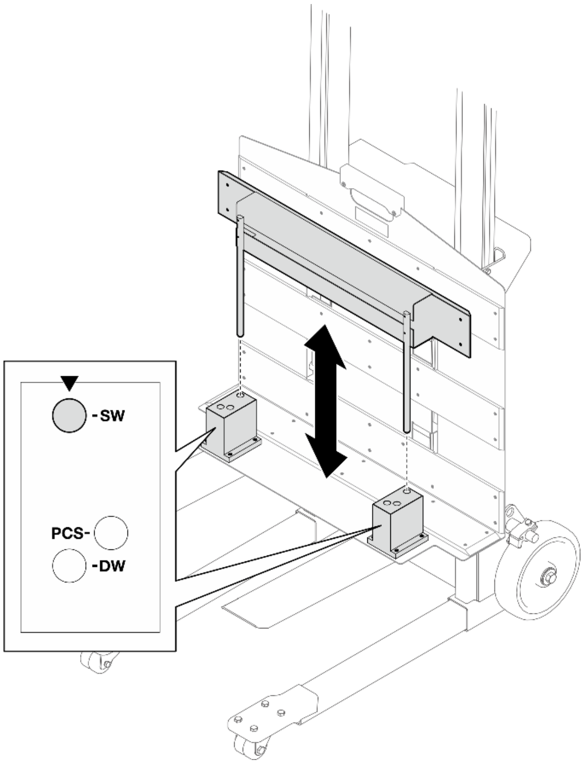


Figure 405. Fixture guide fence set to SW position

Step 3. Move the lift tool assembly to the front of the rack. Make sure the fixture front side is facing the tray back side.

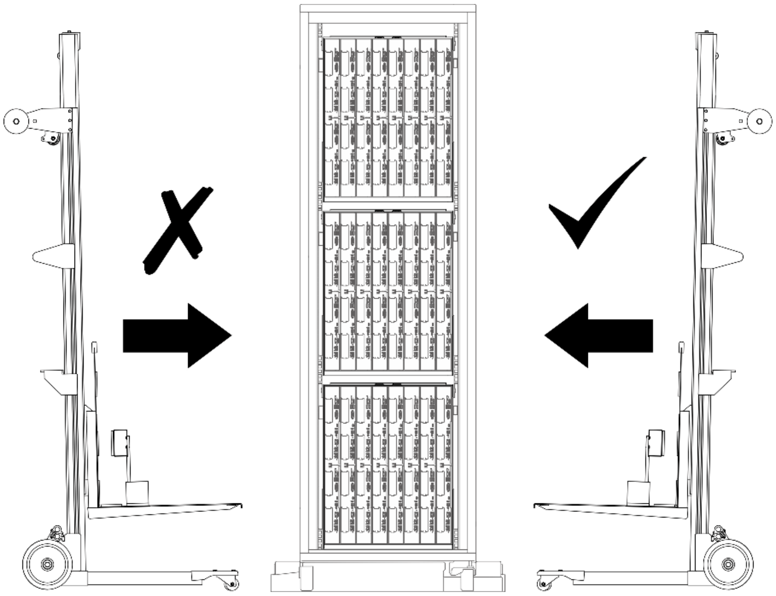
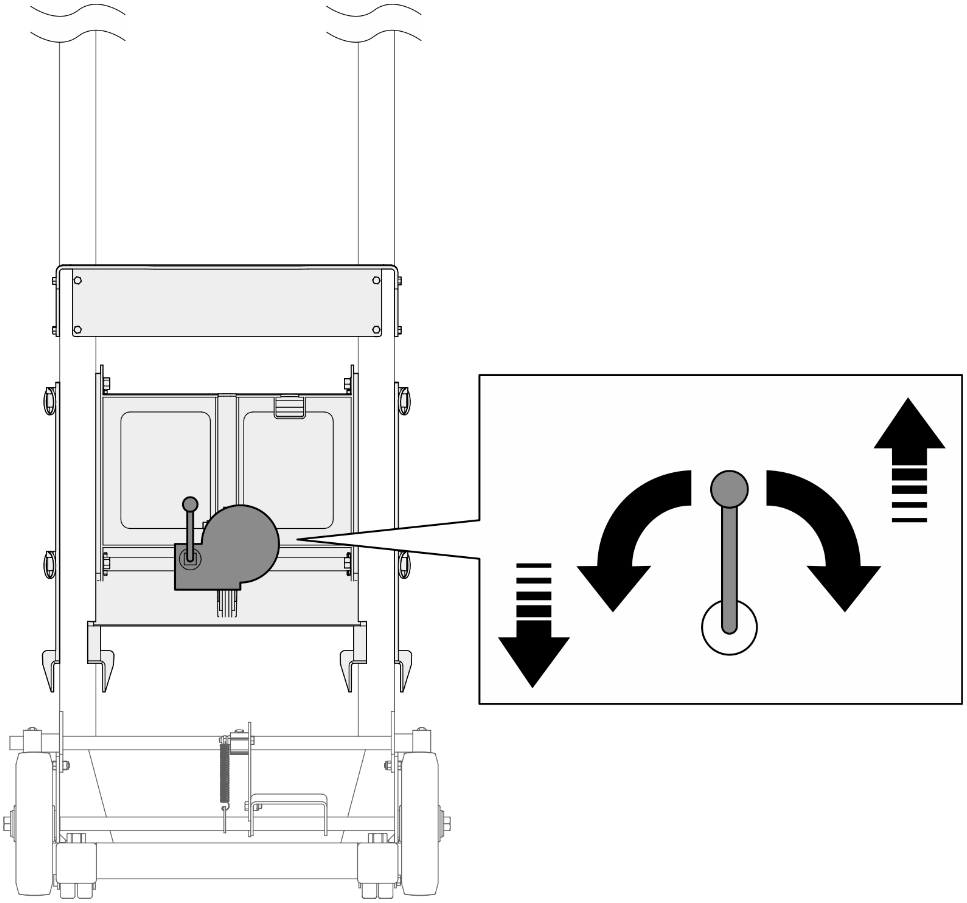


Figure 406. Lift tool assembly placement in front of the rack

Step 4. Adjust the lift tool so that the fixture bottom aligns with the tray bottom, and the fixture front side is in parallel to the tray back side.

Note: Rotate the lift tool handle **clockwise** to raise the fixture; **counterclockwise** to lower the fixture.



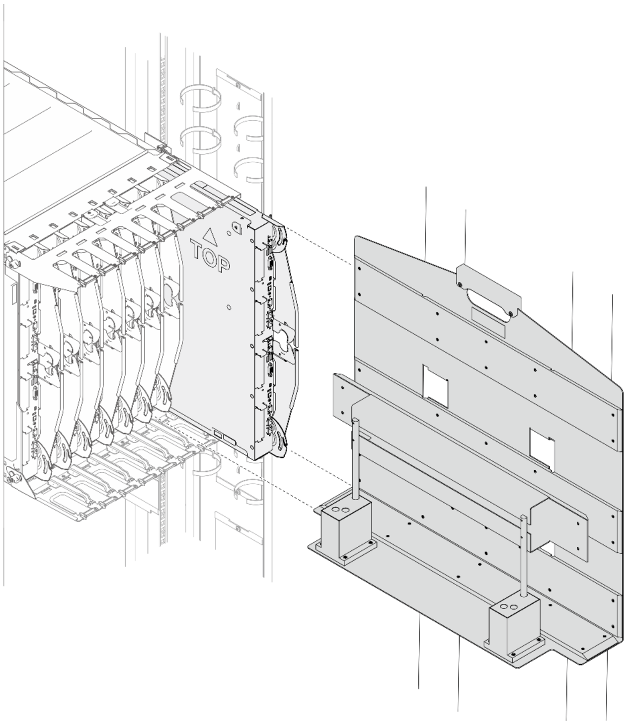


Figure 407. Aligning fixture and the tray bottoms

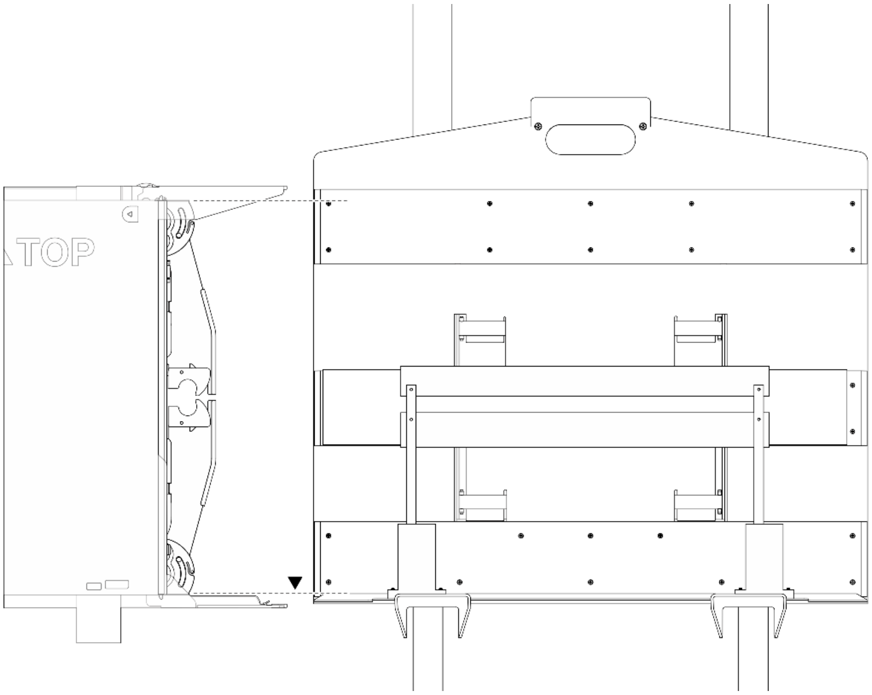


Figure 408. Aligning fixture front side with tray back side

Step 5. Push down the foot pedal to lock the wheel brake of the lift tool.

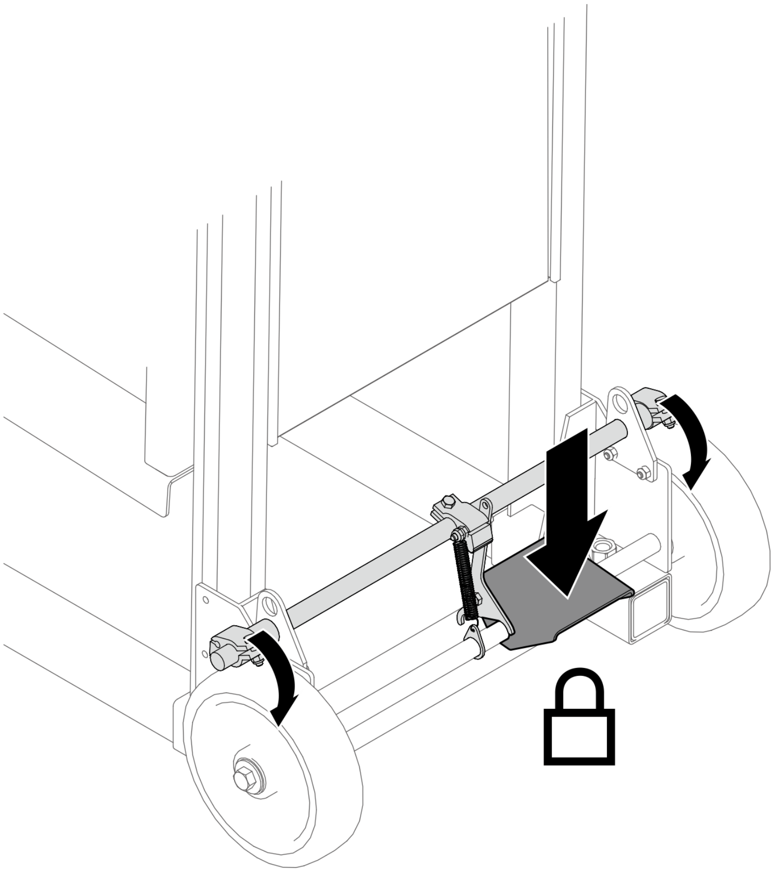


Figure 409. Locking the lift tool wheel brake

Step 6. Transfer the tray to the fixture.

a. ❶ Grab the top and bottom parts of the tray.

b. ❷ Slide the tray onto the fixture.

c. ❸ Make sure the tray is properly seated in the fixture.

Note: Tray weight estimation: 37.215 kg (82.059 lbs)

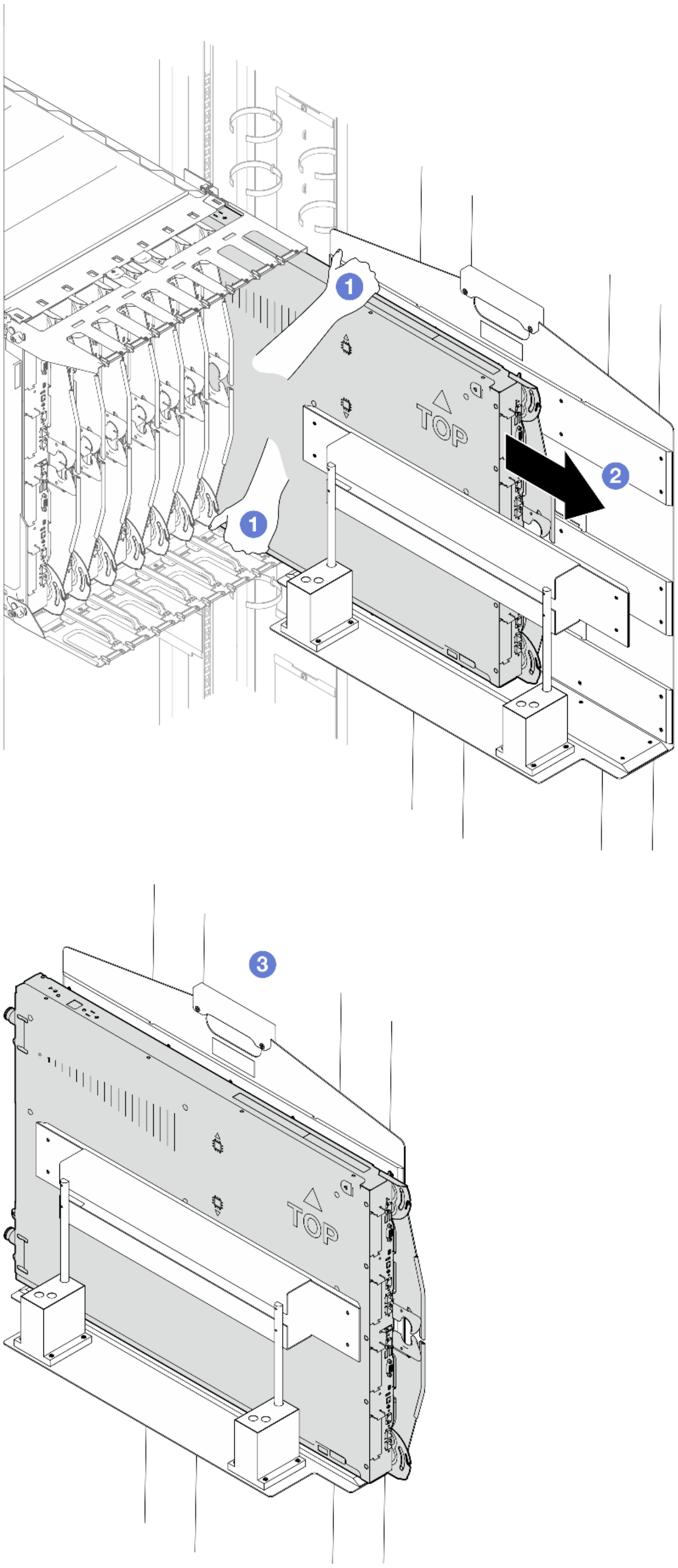


Figure 410. Transferring the tray to the fixture

Step 7. Push down the foot pedal to lock the wheel brakes on the rotate fixture cart.

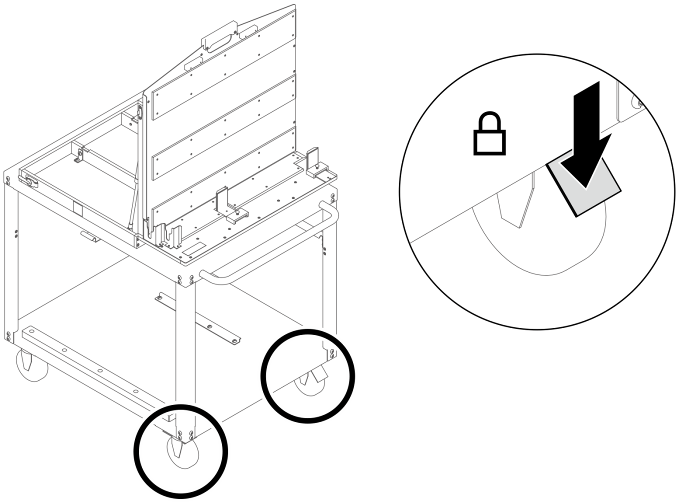


Figure 411. Locking the cart wheel brakes

Step 8. Open the rotate fixture if it is closed.

a. ① Grab the handle, and hold the handle down with extra force.

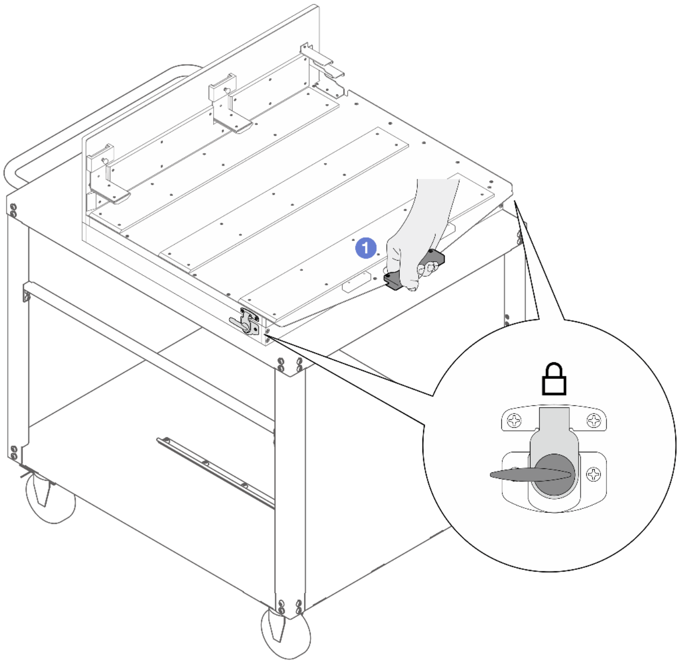


Figure 412. Holding down the rotate fixture handle

b. ② **Keep holding down the handle.** Meanwhile, rotate the latch counterclockwise until it is unlocked. Make sure to unlock the latches on the right and left sides of the fixture.

Attention: Make sure you are holding down the handle while unlocking the latches.

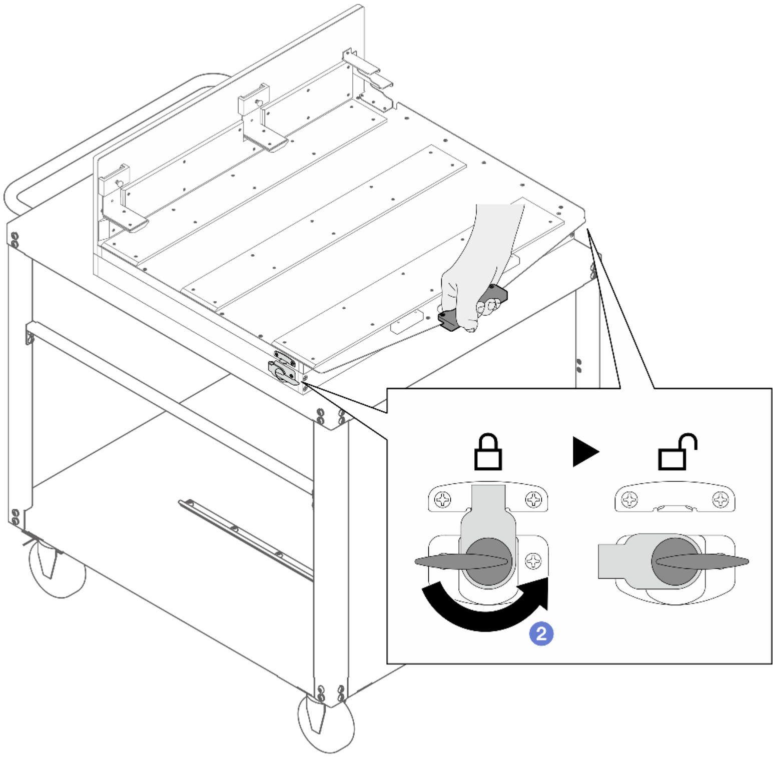


Figure 413. Unlock the rotate fixture latches

c. ③ **Hold the handle;** then, slowly rotate it upward until it stands vertically.

Attention: Make sure you are holding the handle while opening the rotate fixture.

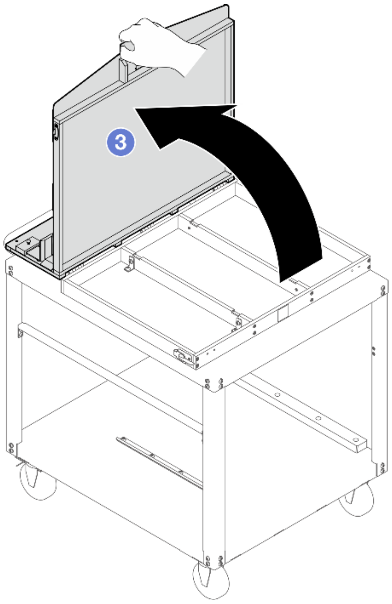
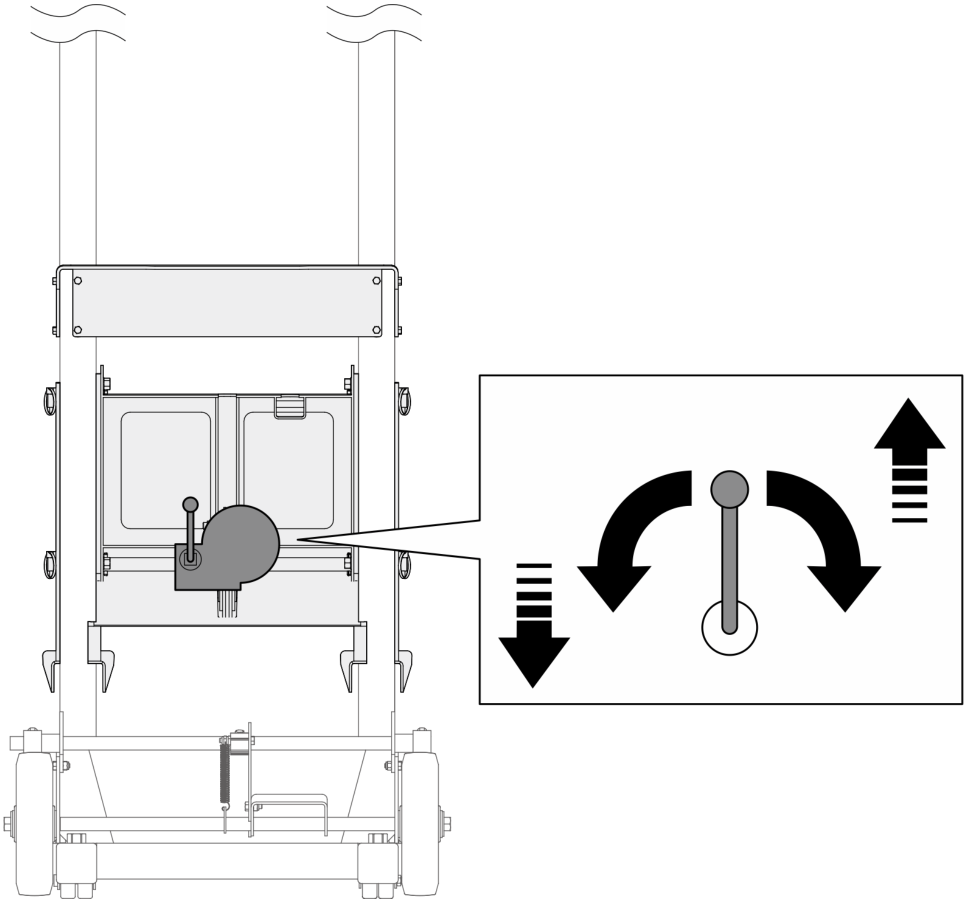


Figure 414. Open the rotate fixture

Step 9. Move the lift tool assembly to the **right side** of the rotate fixture cart assembly (when viewed in front of the rotate fixture) as shown in the illustration below. Adjust the lift tool so that the lift tool fixture bottom aligns with the rotate fixture bottom, and the sides of both fixtures are in parallel.

Note: Rotate the lift tool handle **clockwise** to raise the fixture; **counterclockwise** to lower the fixture.



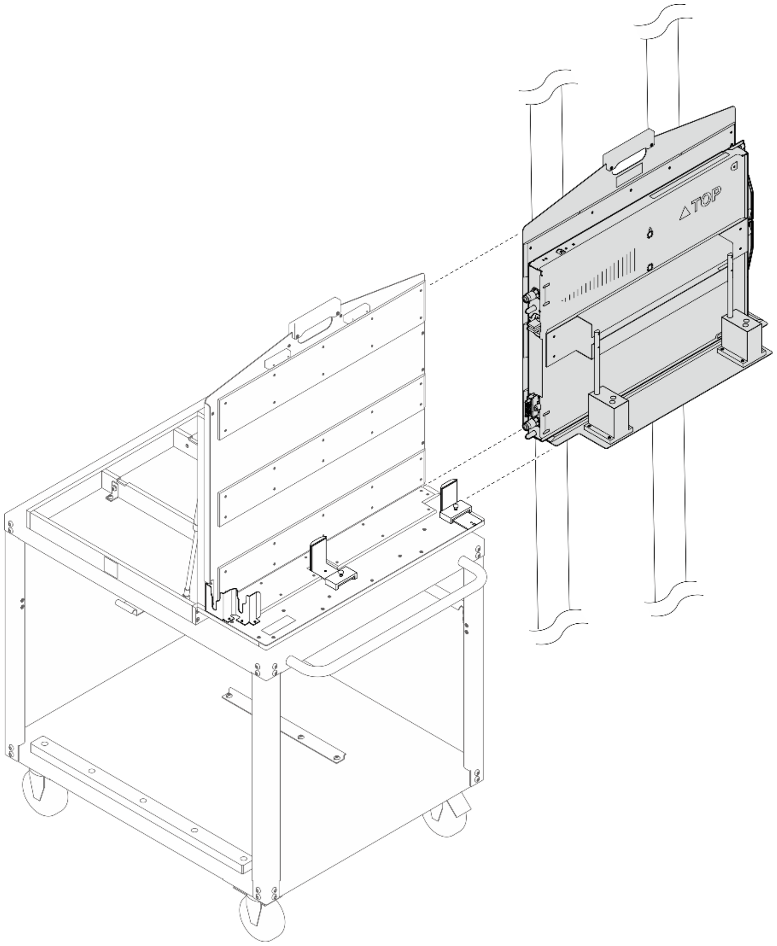


Figure 415. Aligning lift tool fixture and rotate fixture bottoms and sides

Step 10. Push down the foot pedal to lock the wheel brake of the lift tool.

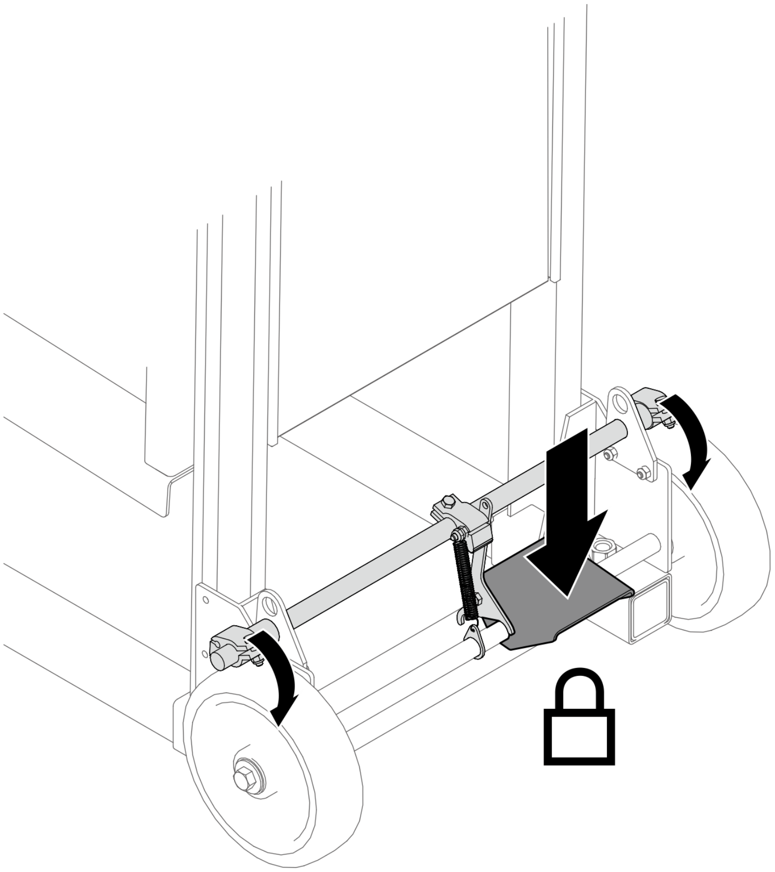


Figure 416. Locking the lift tool wheel brake

Step 11. Adjust the angle brackets on the rotate fixture.

a. Adjust the side angle bracket: ❶ Lift up the plunger. ❷ Slide angle bracket backwards and release the plunger. ❸ Keep sliding bracket until plunger seats into innermost hole.

b. Adjust the inner angle bracket: ❹ Lift up the plunger. ❺ Slide angle bracket forward and release plunger.❻ Keep sliding bracket until plunger seats into outermost hole

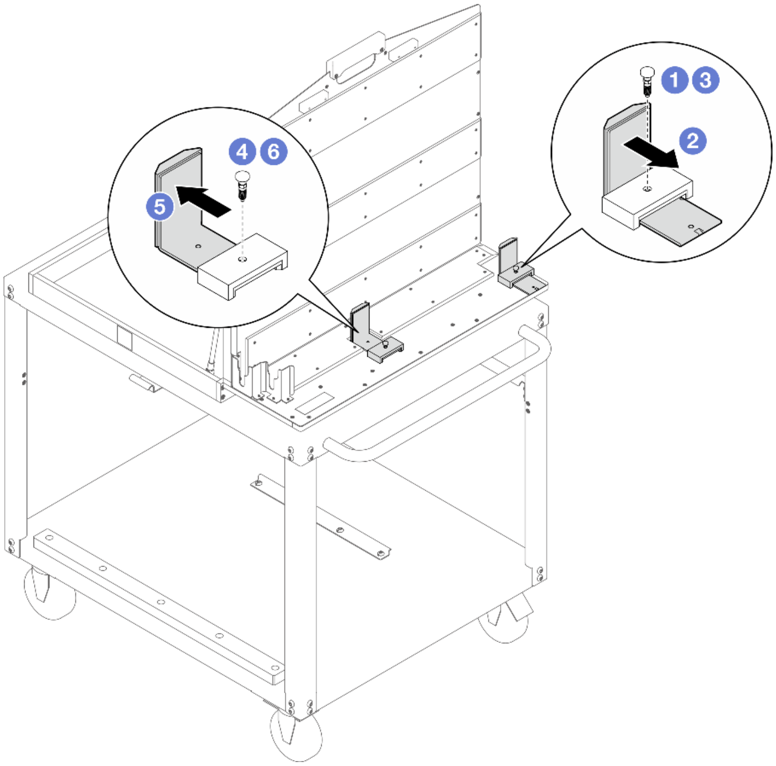


Figure 417. Adjusting the angle brackets of the rotate fixture

Step 12. Transfer the tray to the rotate fixture.

a. ❶ Slide the tray to the rotate fixture until it is partially seated in the rotate fixture.

b. ❷ Slide the tray all the way into the fixture until the tray quick connect is seated in the bracket at the end of the fixture.

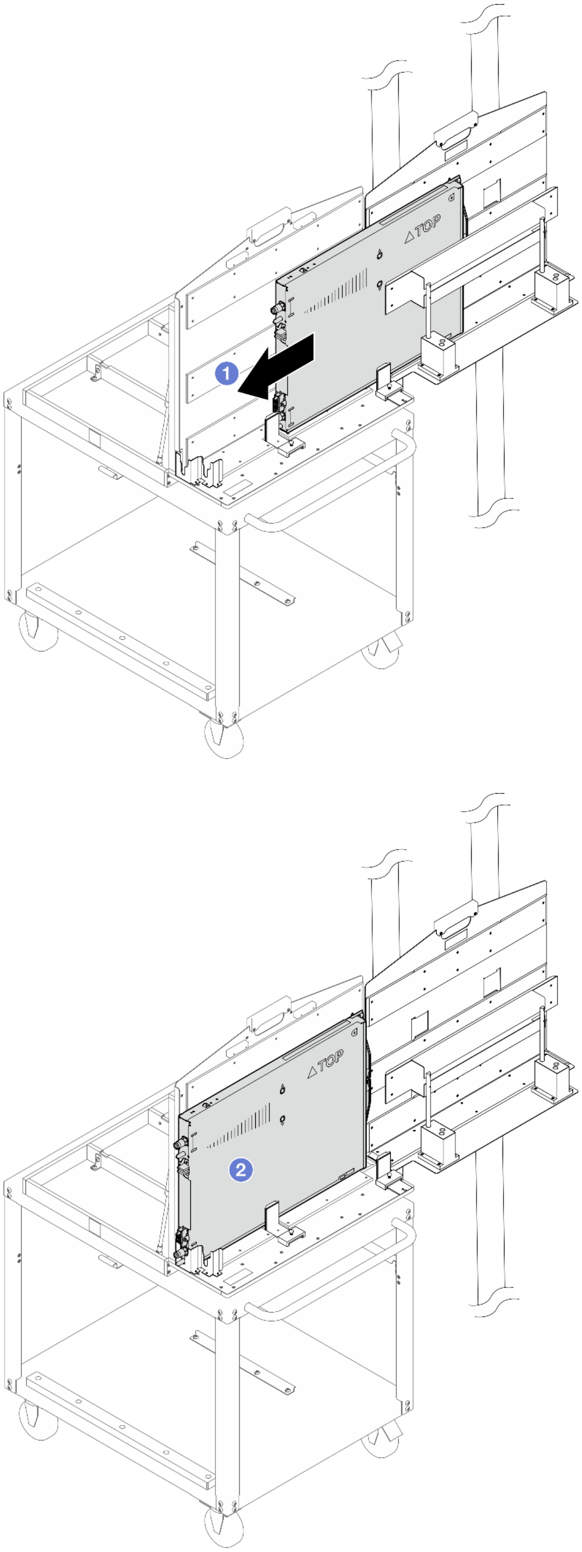


Figure 418. Transferring the tray to the rotate fixture

Step 13. Adjust the side angle bracket: ① Lift up the plunger. ② Slide angle bracket forward and release the plunger. ③ Keep sliding bracket until plunger seats into outermost hole.

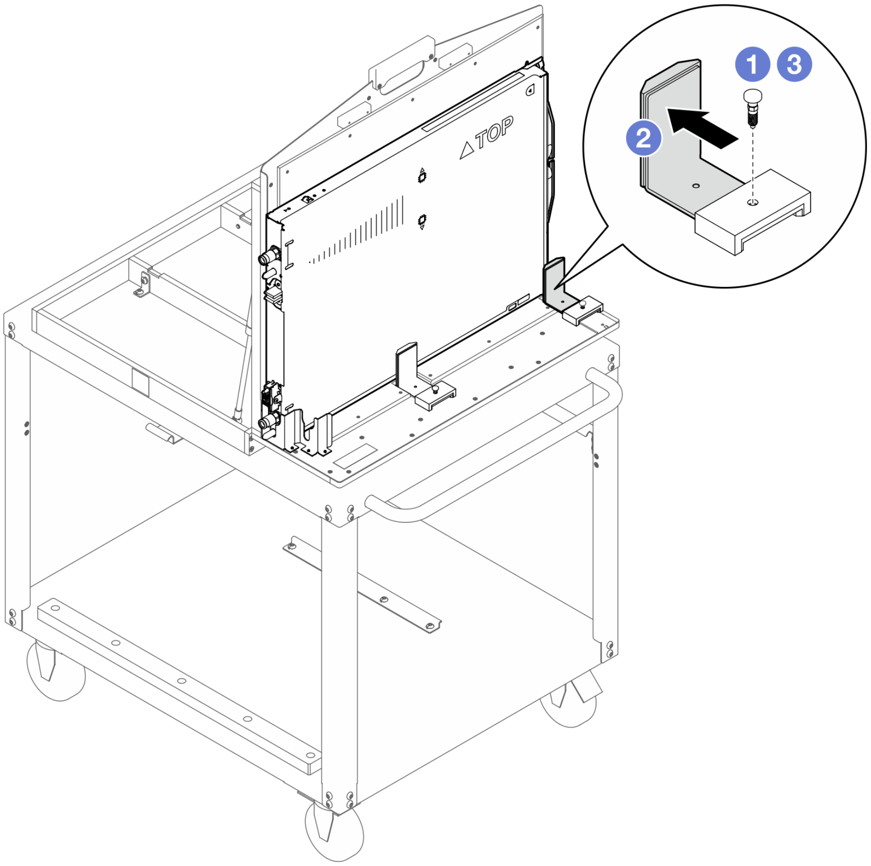


Figure 419. Adjusting the side angle bracket

Step 14. Close the rotate fixture.

a. ① Stand in front of the backside of the rotate fixture. Grab the handle; then, pull down the rotate fixture until the fixture lays flat on the cart top.

Attention: DO NOT put your hands on the support bars in order to prevent injury.

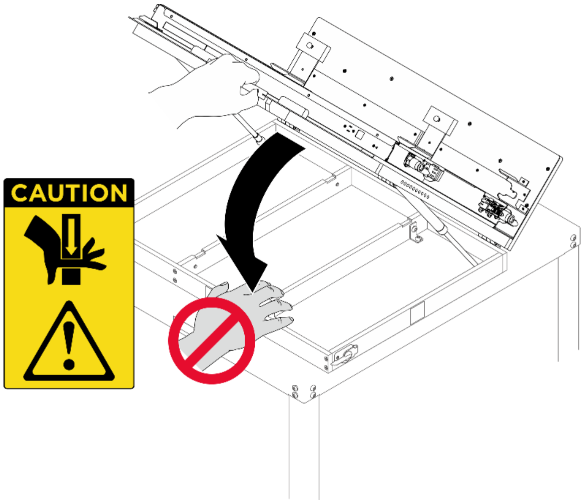


Figure 420. Avoid placing hands on the support bars

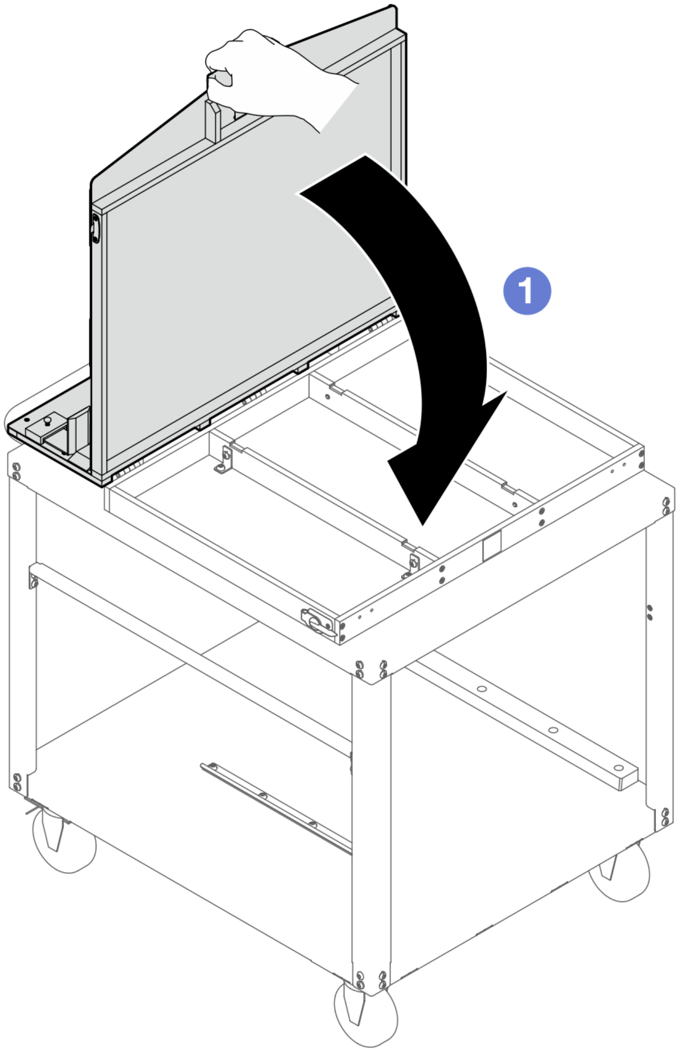


Figure 421. Rotate the rotate fixture plate to the closed position.

b. ❷ Rotate the latch clockwise until it is locked. Make sure to lock the latches on the right and left sides of the fixture

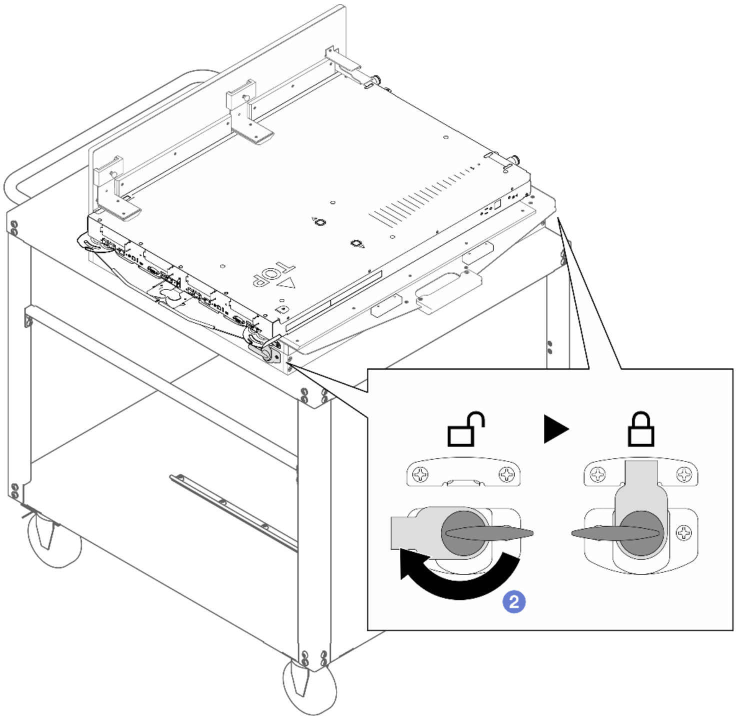


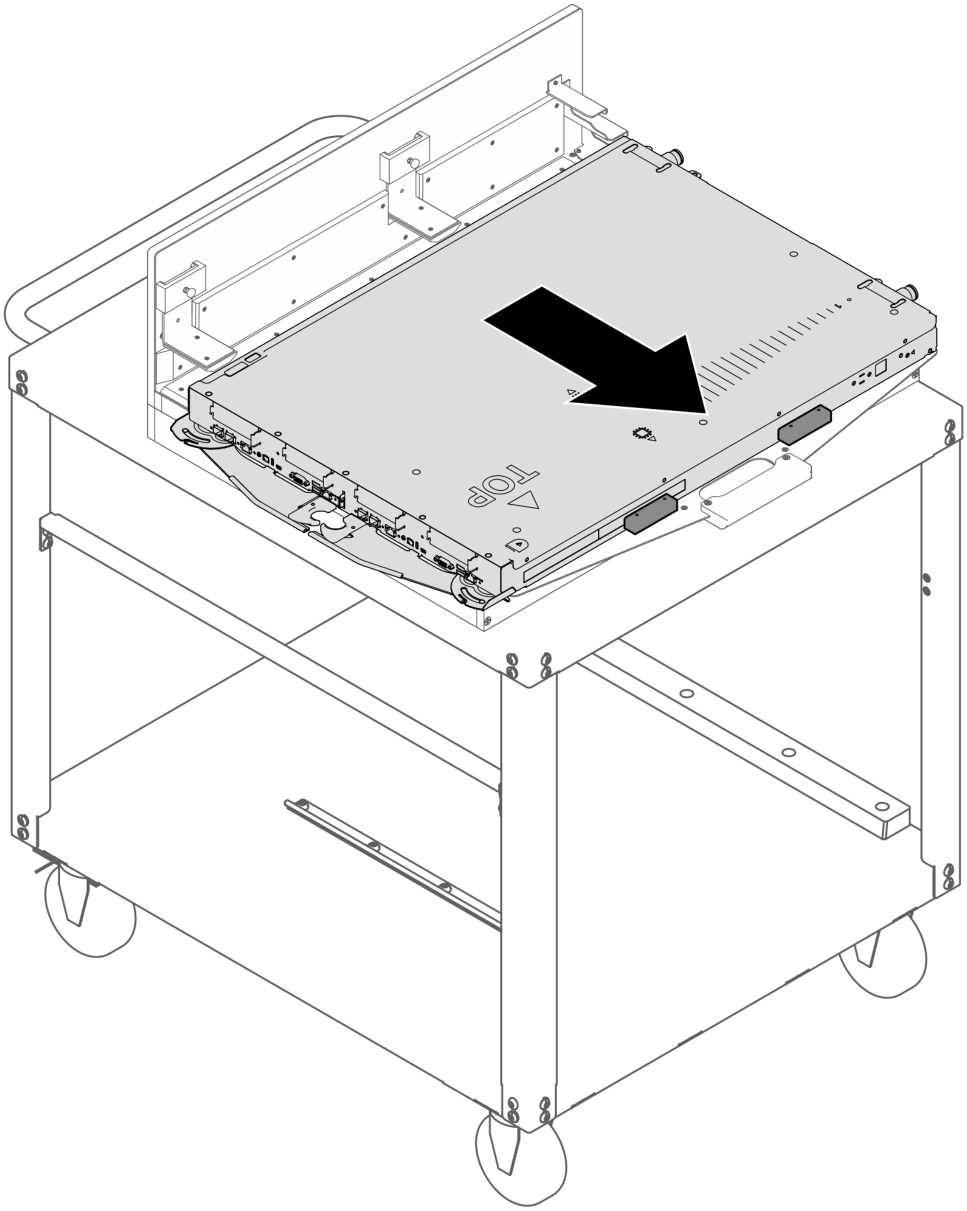
Figure 422. Locking the rotate fixture latches

Step 15. Slide the tray towards fixture handle until it hits the stoppers near the handle. The tray should be clear of the angle brackets.

Attention: **S040**

CAUTION:
Protective gloves should be worn for this procedure.

The tray might be very hot. Wait several minutes to let the tray cool before removing the tray cover.



Step 16. Once the DWC tray has been serviced, place the tray back into the original position as soon as possible.

Attention:

- To maintain proper system cooling, do not operate the enclosure without a DWC tray or tray bay filler installed in each tray bay. For more information, see "Install a tray in the enclosure" on page 354.
- When you remove the DWC tray, note the tray bay number. Reinstalling a DWC tray into a different tray bay from the one it was removed from can have unintended consequences. Some configuration information and update options are established according to tray bay number. If you reinstall the DWC tray into a different tray bay, you might have to reconfigure the DWC tray.

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install a tray in the enclosure

Use this information to install a DWC tray in the enclosure.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- The following illustration might differ slightly from your hardware, but the installation method is the same.

Attention: For safety reasons, when removing a tray or a PCS, it is highly recommended to use the Genie® Lift™ GL™-8 due to the server's weight. Lenovo offers the lift with add on fixtures Genie Lift GL-8 Option Kit and GL-8 Kit for N1380 and SC Systems. If no lift tool is available on-site, customers must move the machine to an accessible, powered area before the trained technician arrives and handles reinstallation. Lenovo strongly advises configuring a complete solution for N1380 and SC-Systems with the lift tool and its add-on features via non-racked items.

Important: Mandatory tools for tray removal and installation.

- Lift tool assembly
  - Genie GL-8 lift tool installed with the lift tool fixture. The foot-release brake should also be attached to the lift tool.
  - For assembling instructions, see "Setting up the lift tool assembly" on page 50
- Rotate fixture cart assembly
  - Rotate fixture installed on the customized cart.
  - For assembling instructions, see "Setting up the rotate fixture cart assembly" on page 54
- For mandatory tools ordering information, see https://serveroption.lenovo.com/.

Attention: **DO NOT** put your hands on the support bars in order to prevent injury.

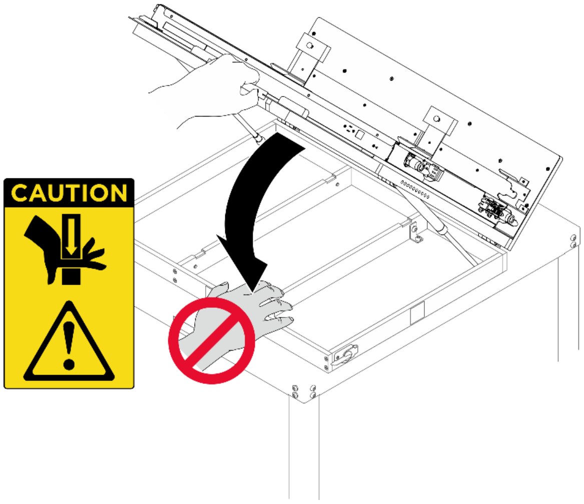


Figure 423. Avoid placing hands on the support bars

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Select the tray bay to install the tray.

Attention:

- To maintain proper system cooling, do not operate the enclosure without a DWC tray or tray bay filler installed in each tray bay. See the picture below for reference.
- Start with tray bay 1 when installing trays into the N1380 enclosure.
- If you are reinstalling a DWC tray that you removed, you must install it in the same tray bay from which you removed it. Some DWC tray configuration information and update options are established according to tray bay number. Reinstalling a DWC tray into a different tray bay can have unintended consequences. If you reinstall the DWC tray into a different tray bay, you might have to reconfigure the DWC nodes in the tray.

Step 2. Push down the foot pedal to lock the wheel brakes on the rotate fixture cart.

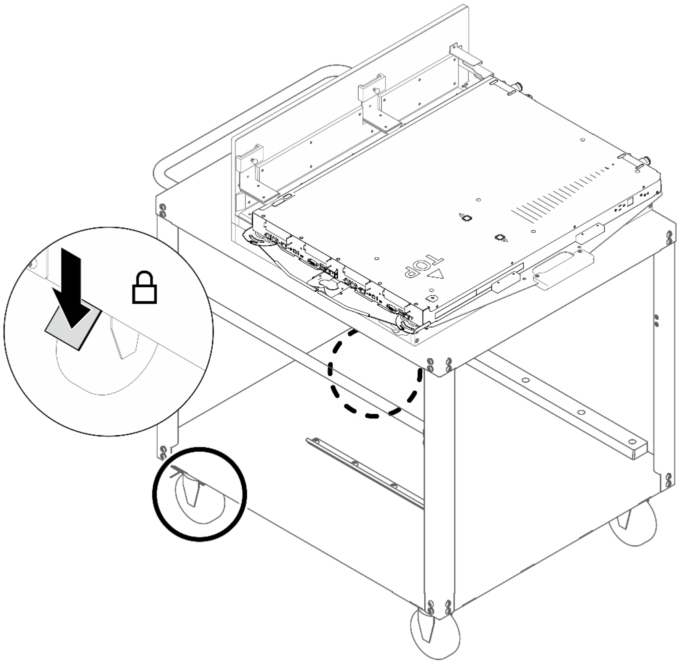


Figure 424. Locking the cart wheel brakes

Step 3. Push the tray into the angle brackets.

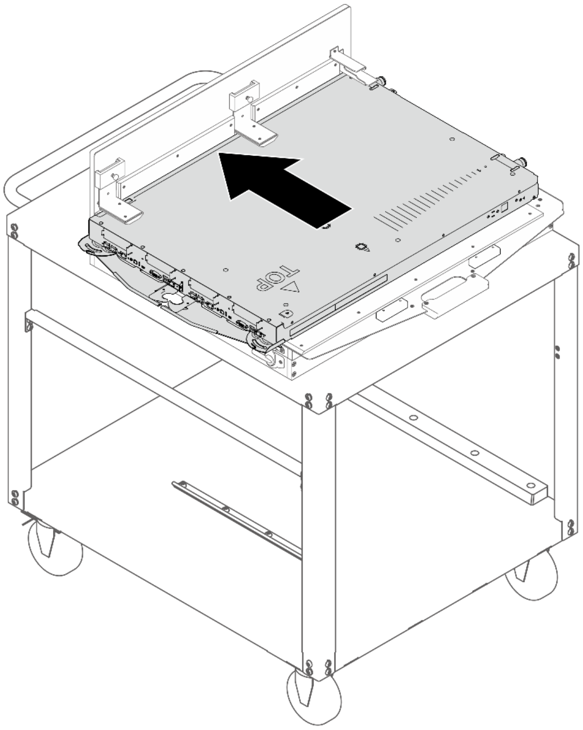


Figure 425. Pushing tray into angle brackets

Step 4. Open the rotate fixture.

a. ① Grab the handle, and hold the handle down with extra force.

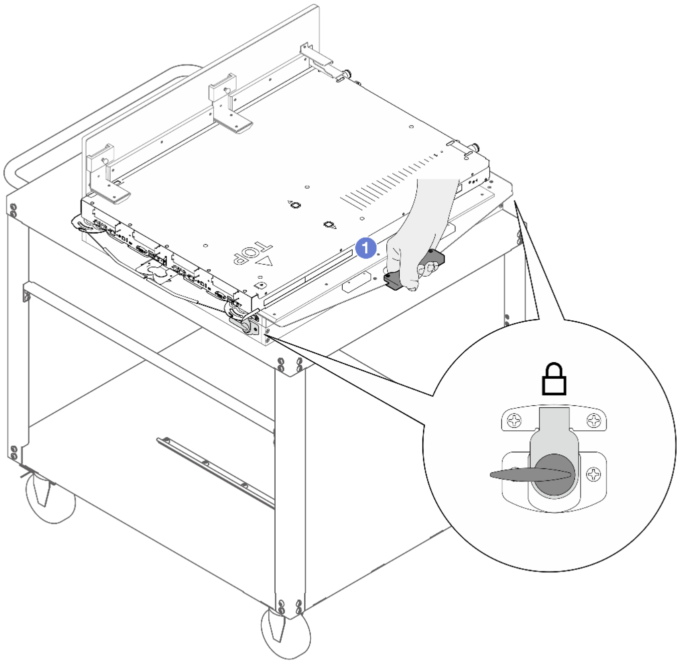


Figure 426. Holding down the fixture handle

b. ② **Keep holding down the handle.** Meanwhile, rotate the latch counterclockwise until it is unlocked. Make sure to unlock the latches on the right and left sides of the fixture.

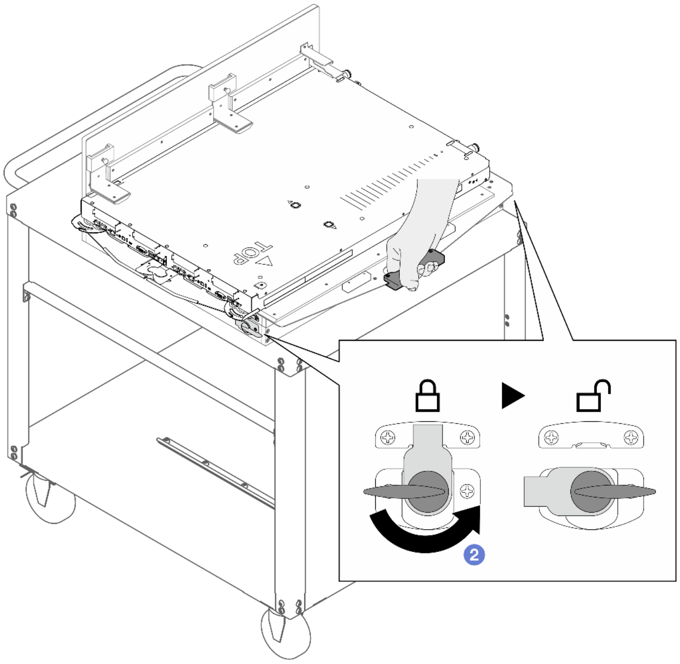


Figure 427. Locking the rotate fixture latches

c. ③ **Hold the handle;** then, slowly rotate it upward until it stands vertically.

Attention: Make sure you are holding the handle while opening the rotate fixture.

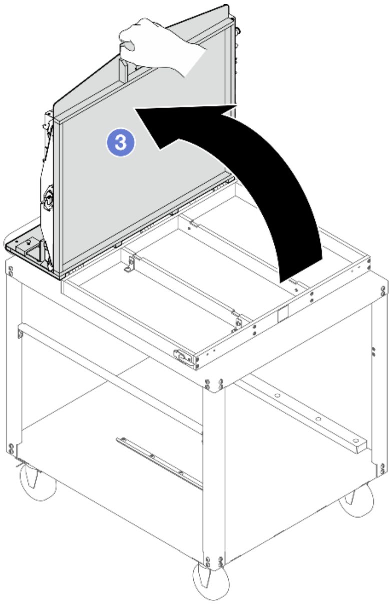


Figure 428. Opening the rotate fixture

Step 5. Adjust the fixture guide fence to the **SW** position (Single Wide). If the guide fence is not in **SW** position, lift the guide fence, and re-install it to the **SW** slots.

Fence label description	Full description
SW	Single Wide
PCS	Power Conversion Station
DW	Double Wide

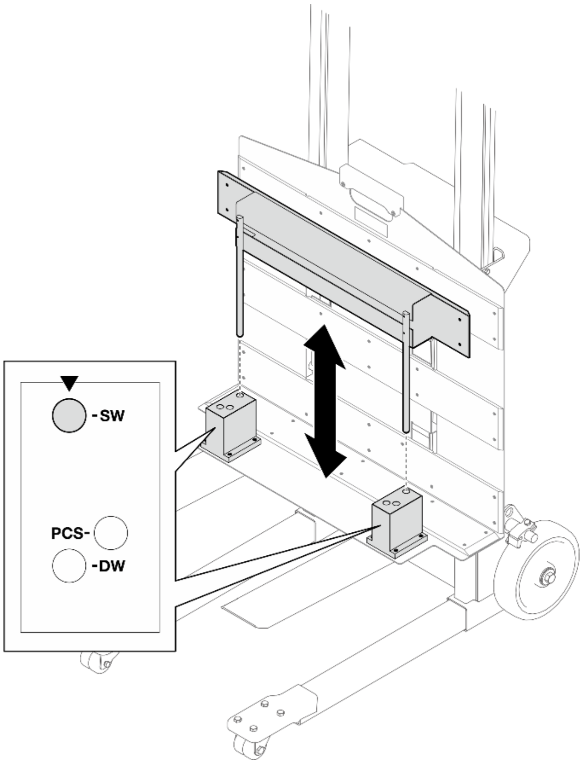
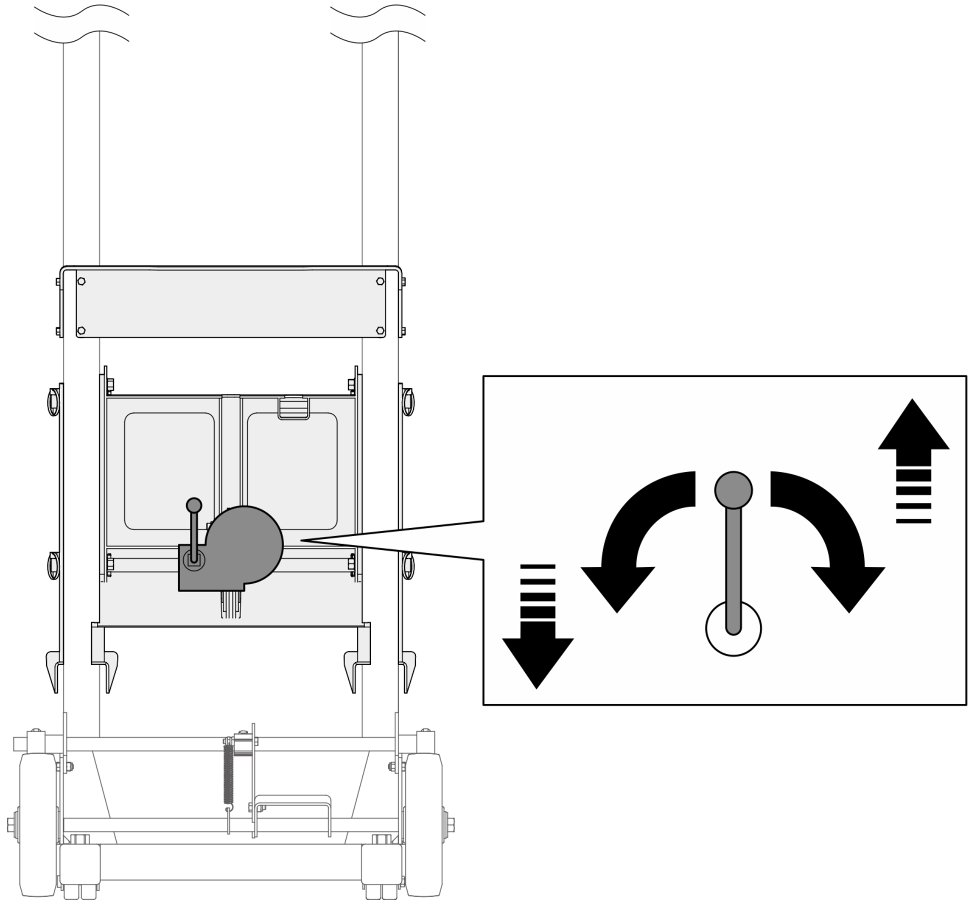


Figure 429. Fixture guide fence set to SW position

Step 6. Move the lift tool assembly next to the rotate fixture cart assembly as shown in the illustration below. Adjust the lift tool so that the lift tool fixture bottom aligns with the rotate fixture bottom, and the sides of both fixtures are in parallel.

Note: Rotate the lift tool handle **clockwise** to raise the fixture; **counterclockwise** to lower the fixture.



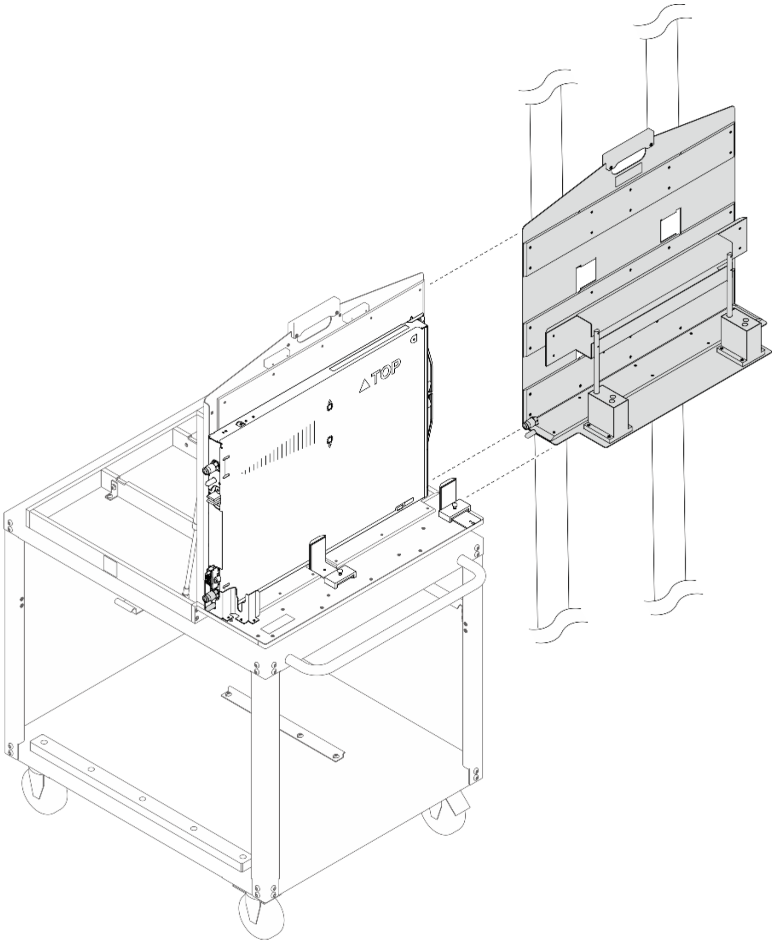


Figure 430. Aligning lift tool fixture and rotate fixture bottoms and sides

Step 7. Push down the foot pedal to lock the wheel brake of the lift tool.

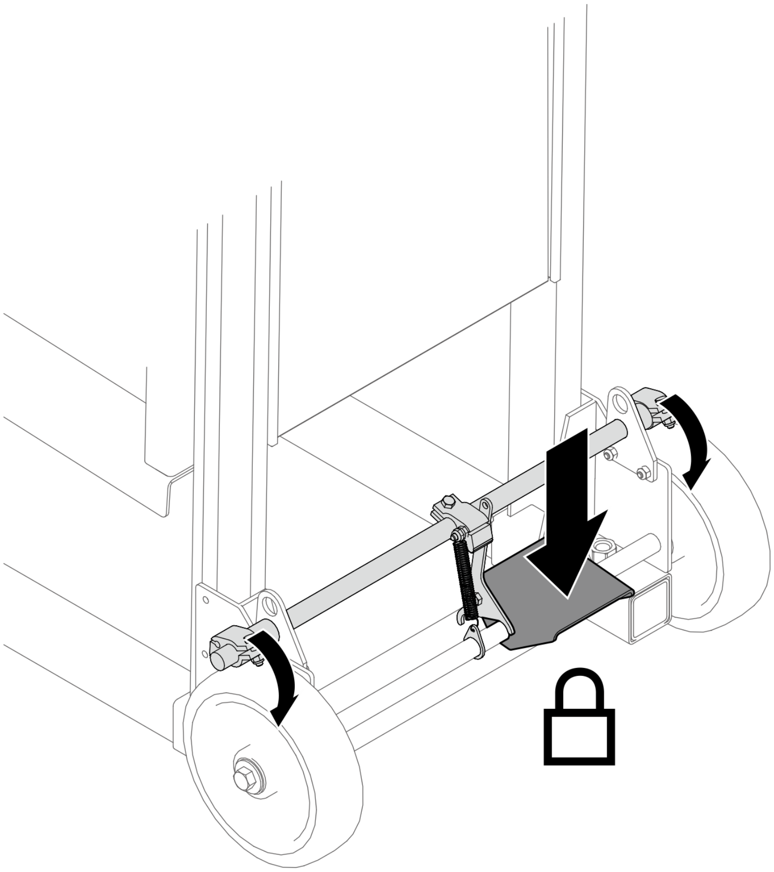


Figure 431. Locking the lift tool wheel brake

Step 8. Transfer the tray to the lift tool fixture.

a. ❶ Slide the tray to the lift tool fixture until it is partially seated in the lift tool fixture.

b. ❷ Slide the tray all the way into the lift tool fixture until the tray is completely seated in the lift tool fixture.

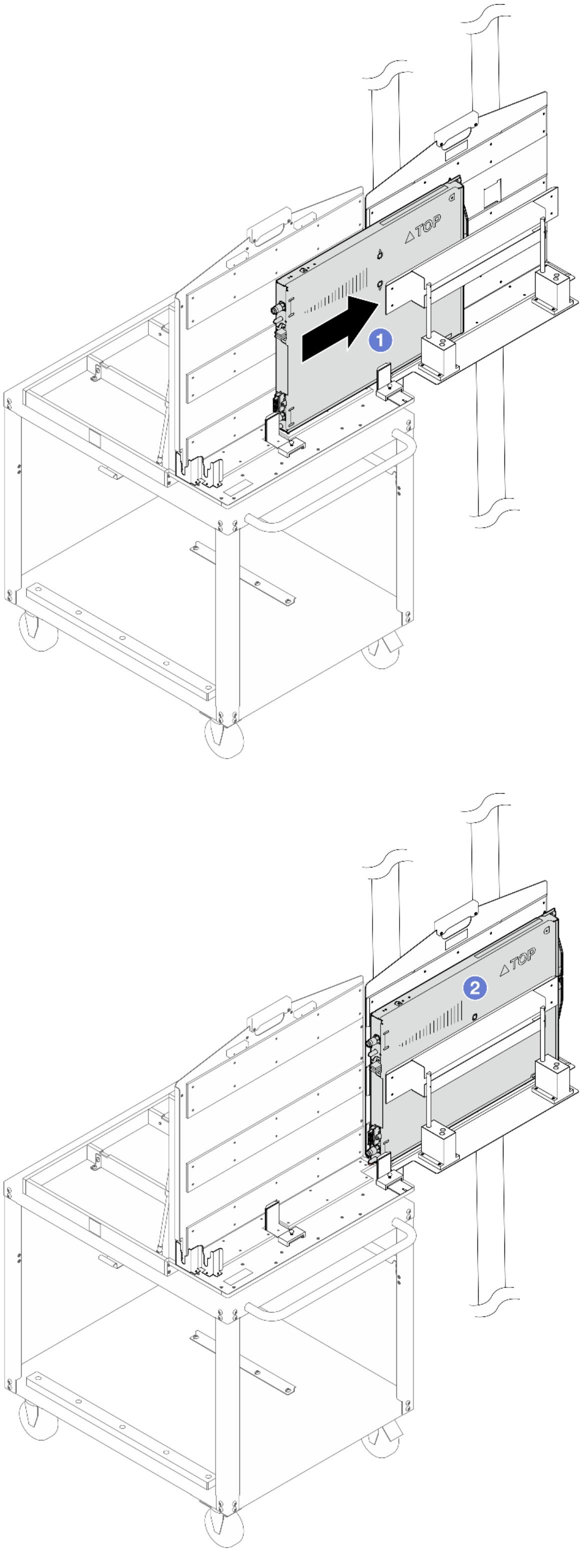


Figure 432. Transferring the tray to the lift tool fixture

Step 9. Move the lift tool assembly to the front of the rack. Make sure the fixture front side is facing the tray back side.

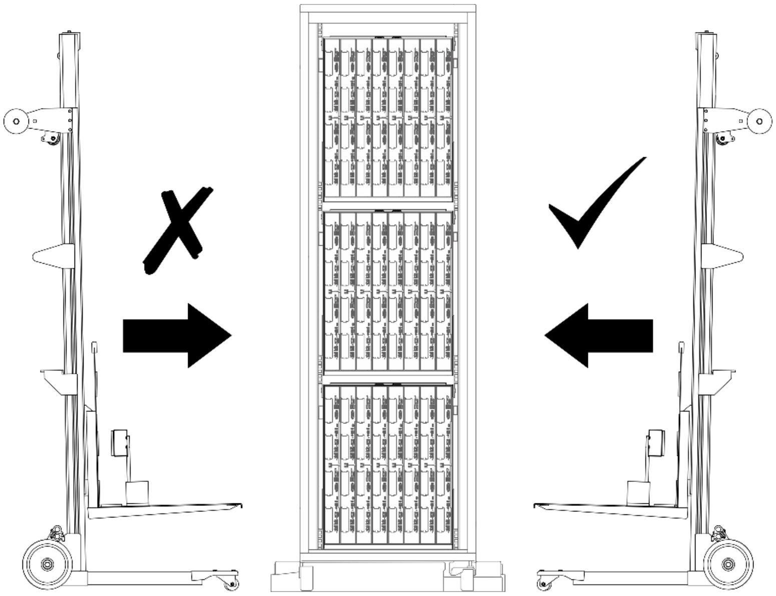
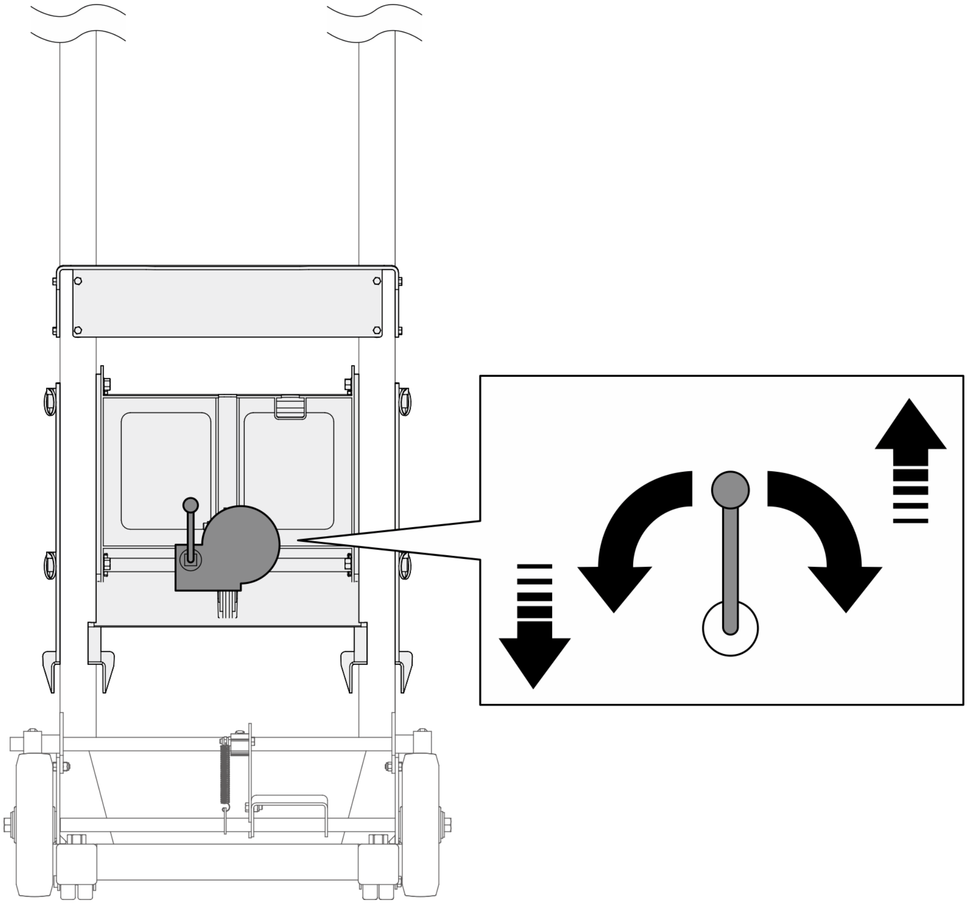


Figure 433. Lift tool assembly placement in front of the rack

Step 10. Adjust the lift tool so that the tray aligns with the tray bay in the enclosure.

Note: Rotate the lift tool handle **clockwise** to raise the fixture; **counterclockwise** to lower the fixture.



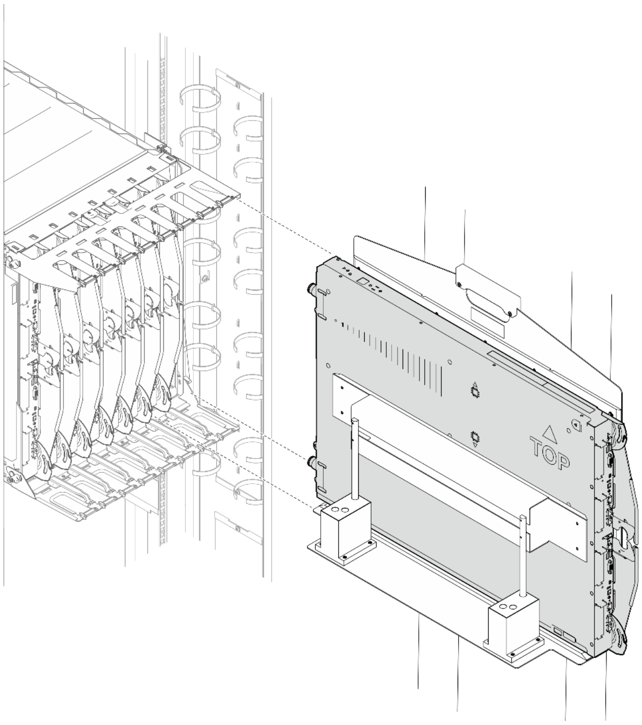


Figure 434. Aligning fixture and the tray bottoms

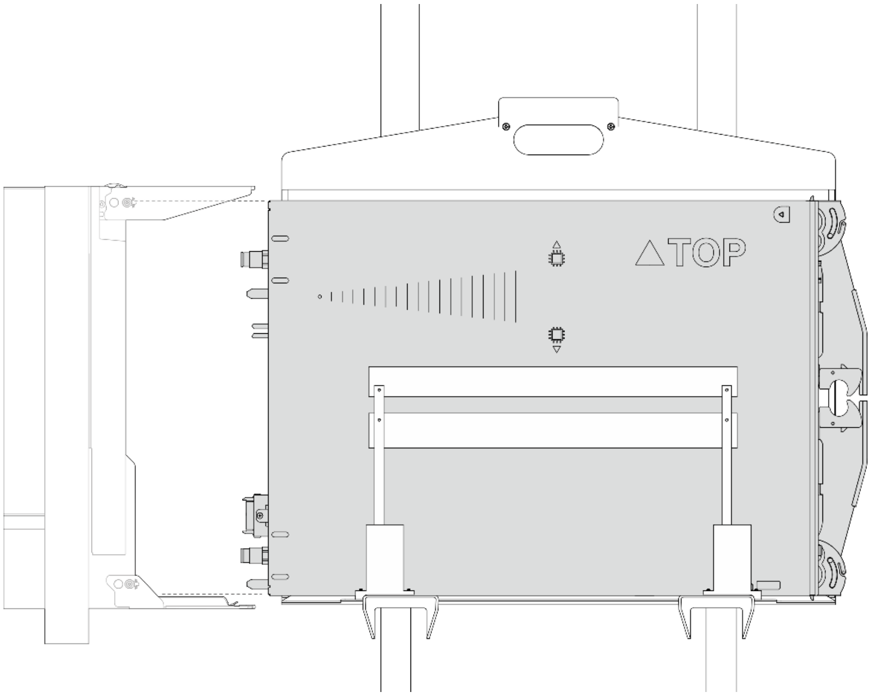


Figure 435. Aligning fixture front side with tray back side

Step 11. Transfer the tray to the tray bay in the enclosure.

a. ❶ Grab the top and bottom parts of the tray.

b. ❷ Slide the tray into the tray bay until only the **TOP** printing is seen.

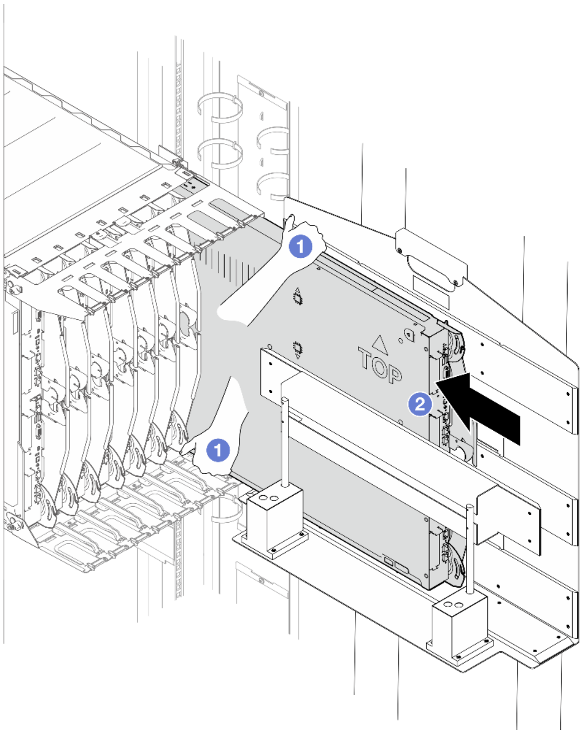


Figure 436. Slising

Step 12. Place the tray into the enclosure.

a. ❶ Rotate the tray handles to the open position.

b. ❷ Insert the tray into the tray bay in the enclosure.

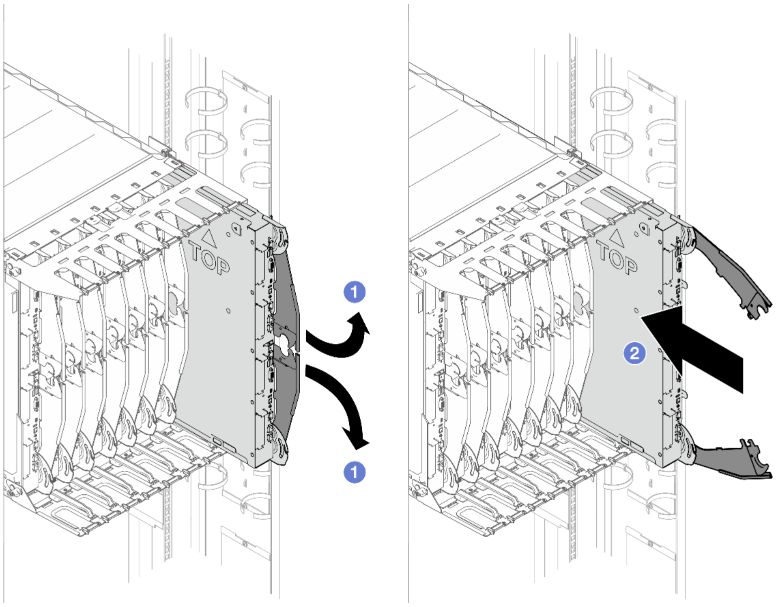


Figure 437. Placing the tray into the enclosure

Step 13. Insert the tray into the tray bay while tray handles are in the open position.

a. ❶ Rotate the tray handles to the open position.

b. ❷ Push the tray into the enclosure until the handles bump into the enclosure edges.

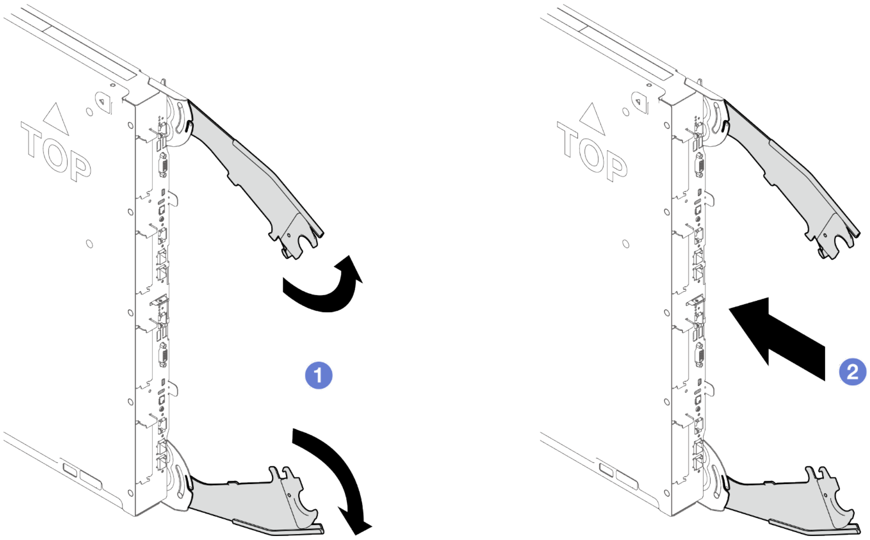


Figure 438. Pushing the tray into the enclosure until handles bump into enclosure edges

Step 14. Push the tray into the enclosure until the tip of the tray handle touches the enclosure. Make sure there is no distance between the enclosure and the tip of the handle.

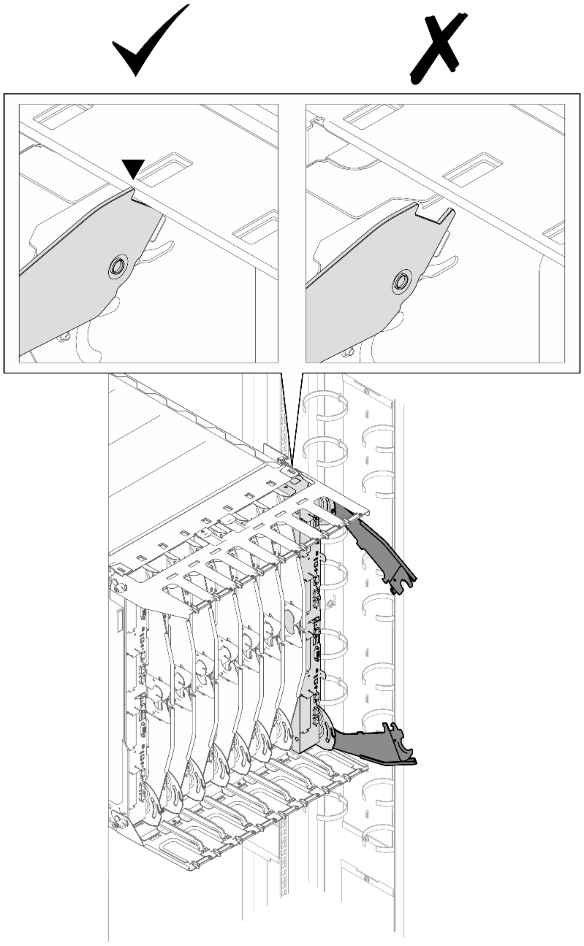


Figure 439. Checking tray handle position

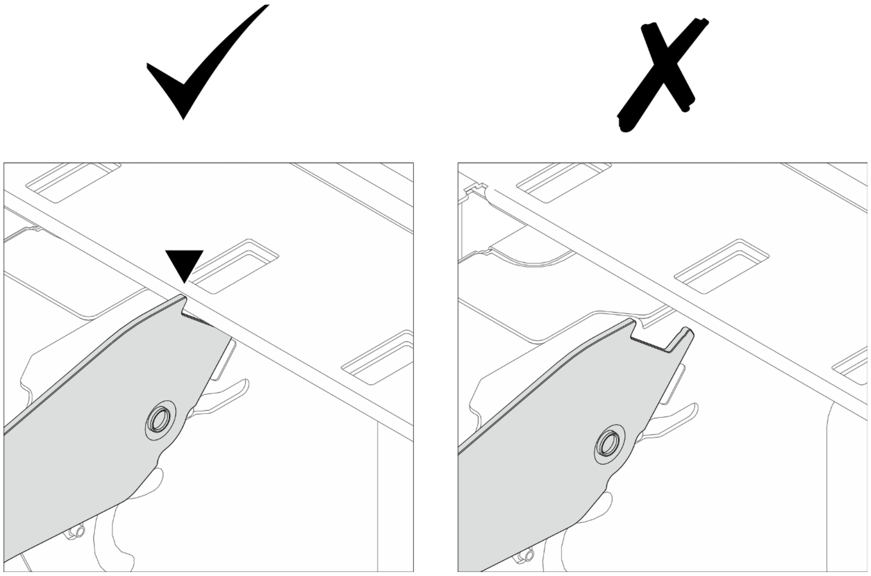


Figure 440. Distinguishing correct tray handle position

Step 15. Rotate the bottom handle for 45 degrees to push the tray slightly into the enclosure. **DO NOT** rotate the bottom handle all the way in.

Note: If the tray does *not* move into the enclosure as you rotate the bottom handle, the handles are not in correct position. Reinstall the tray until the handles are seated correctly and handle rotation can bring about tray movement.

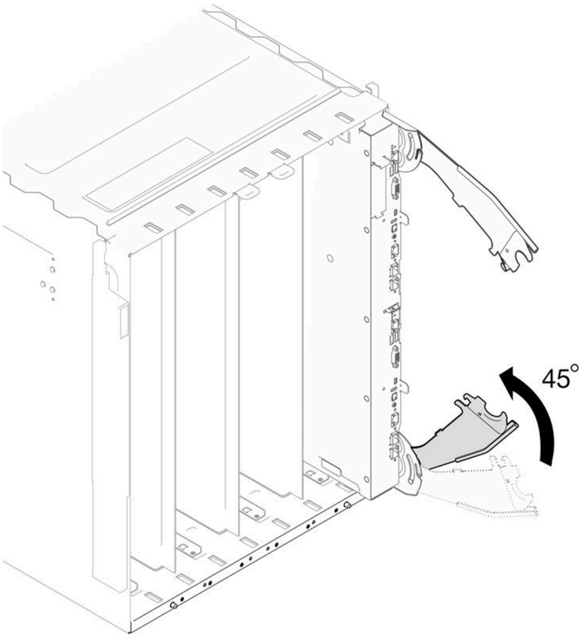


Figure 441. Slightly rotating bottom tray handle to move the tray forward

Step 16. Rotate both top and bottom handles to the closed position to secure the tray in the enclosure.

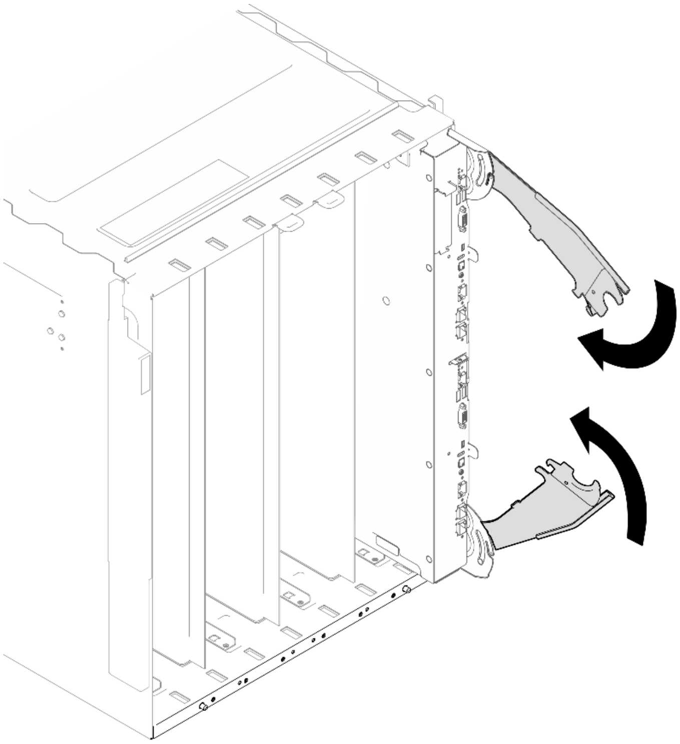


Figure 442. Rotating both tray handles to the closed position

Step 17. Make sure the tray does not protrude from the enclosure. The surface of the tray front bezel and the enclosure outer frame should be aligned as a flat surface.

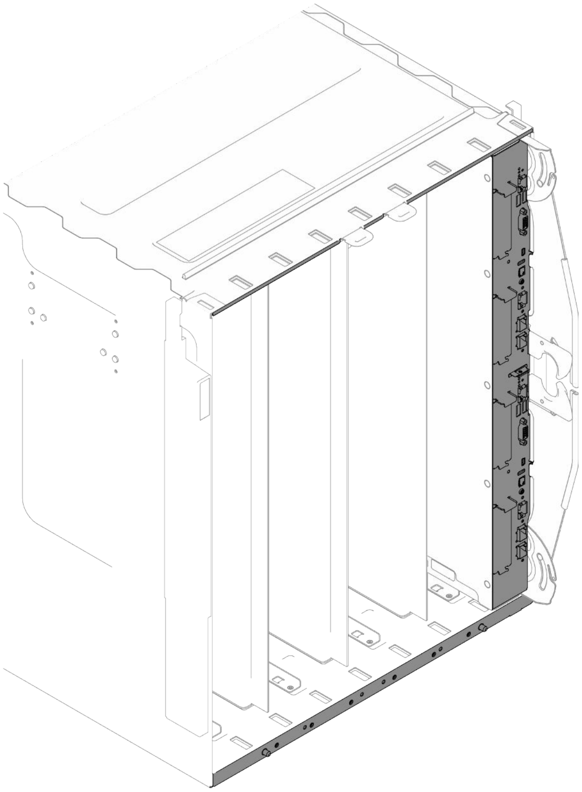


Figure 443. Tray front bezel and enclosure outer frame surface alignment

Note: After the DWC tray is installed, the XCC in the DWC tray initializes. This process takes approximately 110 seconds. The power LED flashes rapidly, and the power button on the DWC tray does not respond until this process is complete.

Step 18. Connect all required external cables to the enclosure.

Note: Use extra force to connect QSFP cables to the solution.

Step 19. Press the power buttons to turn on both nodes in the DWC tray.

Step 20. Make sure that the power LED on the front operator panel is lit continuously, indicating that the each node is receiving power and is turned on.

Step 21. If you have other trays to install, do so now.

After you finish

- If this is the initial installation of the DWC tray in the enclosure, you must configure the DWC tray through the Setup Utility and install the DWC tray operating system.
- If you have changed the configuration of the DWC tray or if you are installing a different DWC tray from the one that you removed, you must configure the DWC tray through the Setup Utility, and you might have to install the DWC tray operating system.

Notes: Server and switch cable are routed through the cable retainers on the bottom front support bracket.

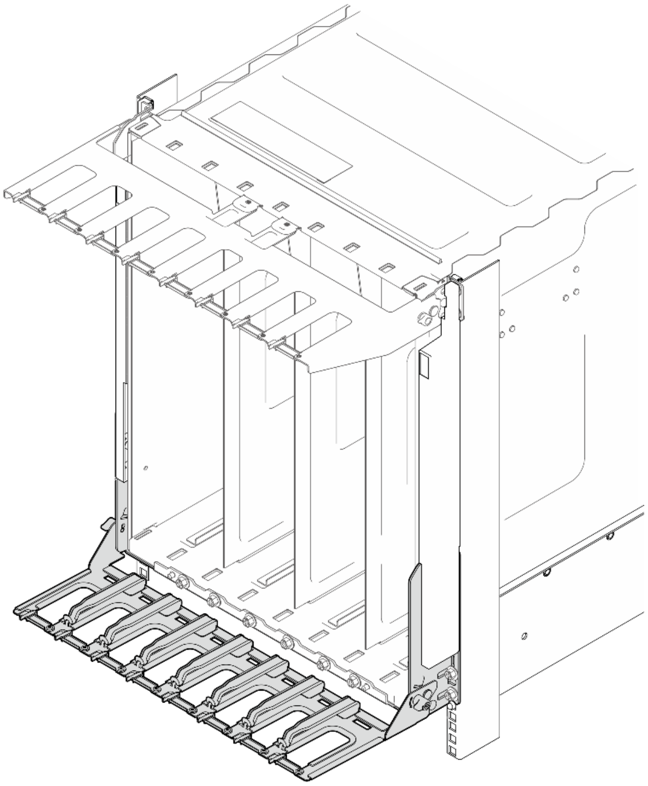
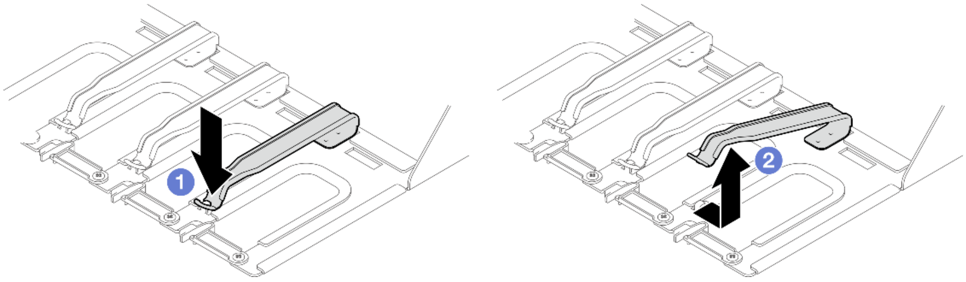
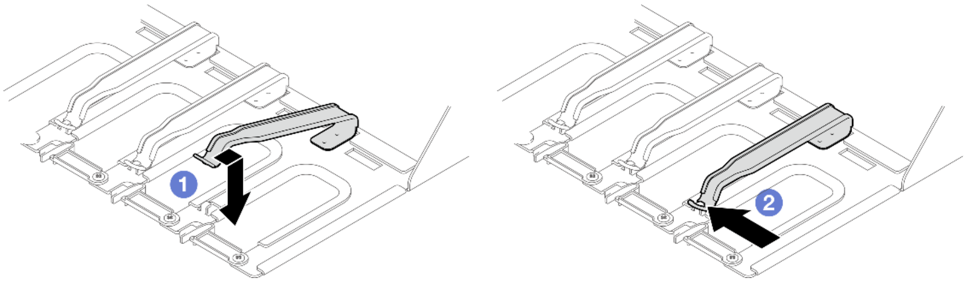


Figure 444. Bottom support bracket

1. Opening the cable retainer
    - ① Press down the cable retainer.
    - ② Pull the cable retainer to the right; then, pull it up.



2. Closing the cable retainer
    - ① Pull the cable retainer to the right; then, press it down.
    - ② Pull the cable retainer to the left to secure it to the support bracket.



Tray cover replacement

Use the following procedures to remove and install the tray cover.

Remove the tray cover

Use this information to remove the tray cover.

About this task

Attention:

- Read “Installation Guidelines” on page 33 and “Safety inspection checklist” on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: The tray might be very hot. Wait several minutes to let the tray cool before removing the tray cover.

Step 1. Remove the tray from the enclosure. See “Remove a tray from the enclosure” on page 332.

Step 2. Press on the release latch and the push point at the same time and slide the cover toward the rear of the DWC tray.

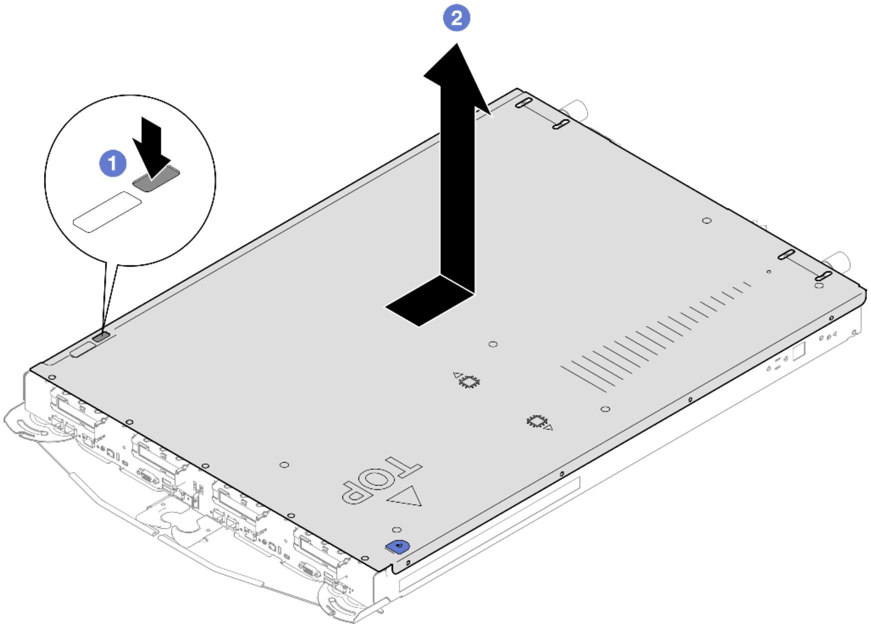


Figure 445. Tray cover removal

Step 3. Lift the cover off the DWC tray and set it aside.

Note: Service label instructions are located on the underside of each tray cover.

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the tray cover

Use this information to install the tray cover.

About this task

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.

Note: The following illustration might differ slightly from your hardware, but the installation method is the same.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Step 1. Position the cover on top of the tray and slide the cover towards the front of the tray.

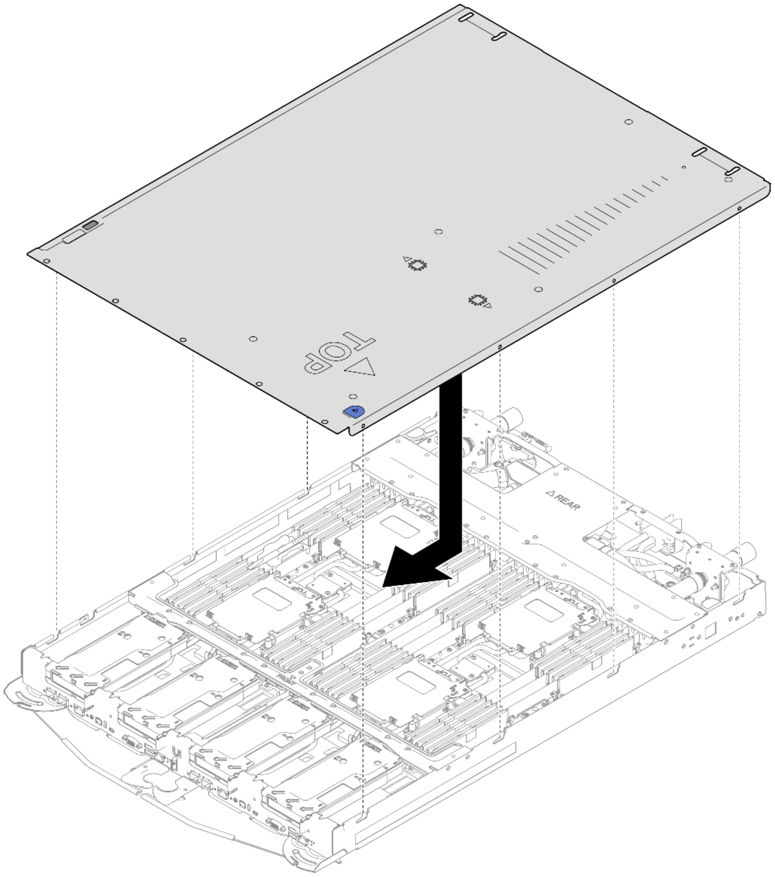


Figure 446. Tray cover installation

Important: Before you slide the cover forward, make sure that all the tabs on the front, rear, and side of the cover are engaged with the enclosure correctly. If all the tabs do not engage the enclosure correctly, it will be very difficult to remove the cover later.

After you finish

1. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
2. Connect all required external cables to the solution.

   Note: Use extra force to connect QSFP cables to the solution.
3. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

   Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see "PCIe adapter cable routing" in *SC750 V4 Cable Routing Guide*.

Water loop replacement (trained technician only)

Use the following procedures to remove and install the water loop in the tray.

Attention:

- The water loop replacement procedure requires trained personnel.
- For your safety, use lift tool to remove the tray from the enclosure.

Remove the water loop

Use this information to remove the water loop.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, T20, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

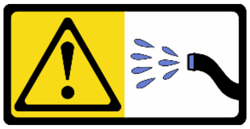
S038

CAUTION:
Eye protection should be worn for this procedure.

S040

CAUTION:
Protective gloves should be worn for this procedure.

S042



DANGER

Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.

- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuluRw0g8.

Procedure

Step 1. Make preparations for this task.

a. Remove the tray from the enclosure. See "Remove a tray from the enclosure" on page 332.

b. Remove the tray cover. See "Remove the tray cover" on page 372.

c. If DIMM comb is installed, remove it. See "Remove a DIMM comb" on page 112.

d. Remove the memory module, perform one of the following.
  - Remove memory modules that require single-side cooling. See "Remove a memory module (single-side cooling)" on page 218.
  - Remove memory modules that require dual-side cooling. See "Remove a memory module (dual-side cooling)" on page 203.

e. Remove the cross braces. See "Remove the cross braces" on page 108.

f. If DIMM cooling bars are installed, remove them. See "Remove a DIMM cooling bar" on page 116.

g. Remove the front E3.S drive cage. see "Remove an E3.S front drive cage assembly" on page 121.

h. Remove the PCIe adapter riser assembly. See "Remove a ConnectX-7 NDR 200 adapter riser assembly" on page 71 or "Remove a ConnectX-7 NDR 400 adapter riser assembly" on page 83.

i. Remove the middle E3.S drive cage. see "Remove an E3.S middle drive cage assembly" on page 157.

j. Remove the sideband cable kit. See "Remove the system management sideband cable kit" on page 327.

k. Remove the leakage sensor module. See "Remove the leakage sensor" on page 197.

Step 2. Remove the four PH1 screws to remove the middle drive cold plates from the water loop. Use a torque screwdriver set to the proper torque.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- There are two middle drive cold plates per node, and a total of four cold plates per tray. Make sure to remove all four cold plates from the water loop.

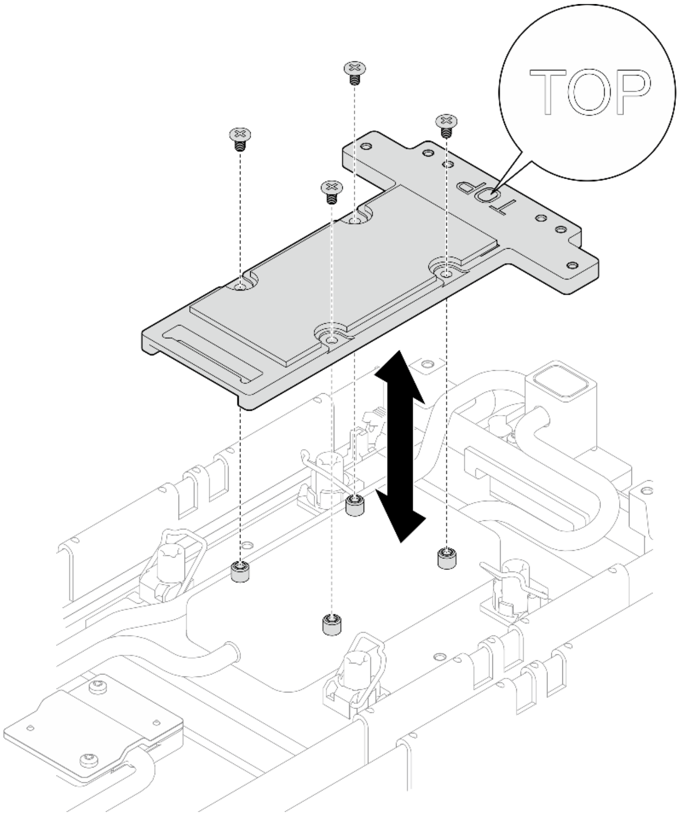


Figure 447. Removing middle drive cold plate

Step 3. Remove the two T10 screws to remove the VR cover with a torque screwdriver set to the proper torque. Make sure to remove two VR covers from the water loop (one VR cover per node).

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

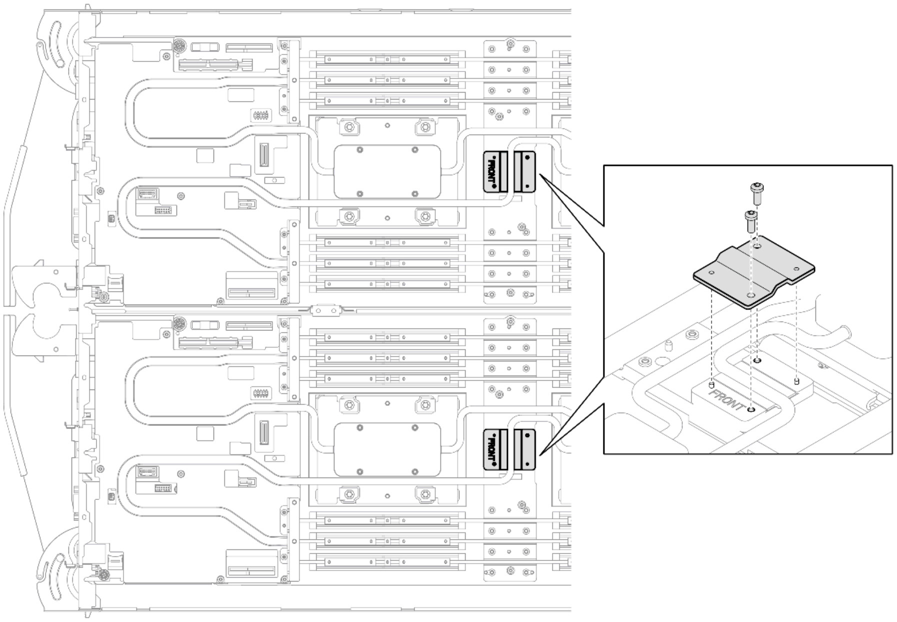


Figure 448. Removing the VR covers

Step 4. Remove eight (8x) Torx T10 screws to remove the two quick connects (four screws for each quick connect). Use a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

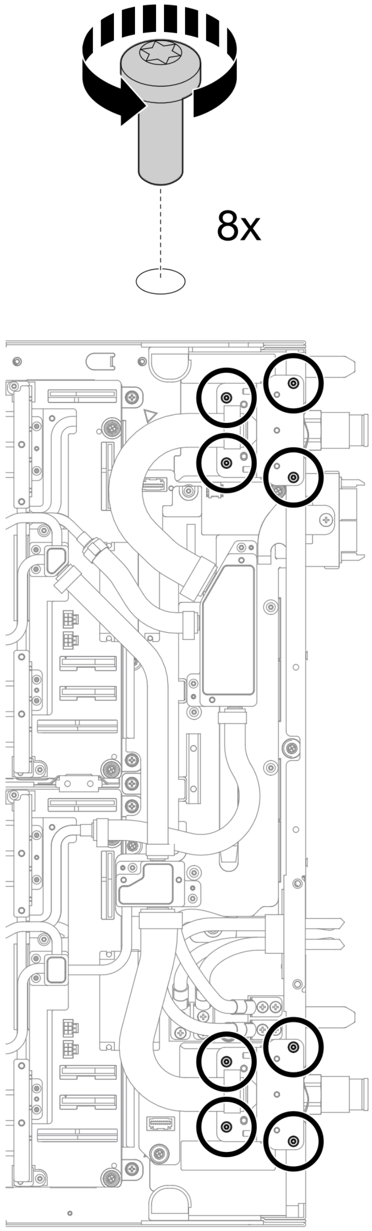


Figure 449. Removing quick connect screws

Step 5. Remove four Torx T10 screws to remove the mixing chambers from the power distribution board cold plate with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

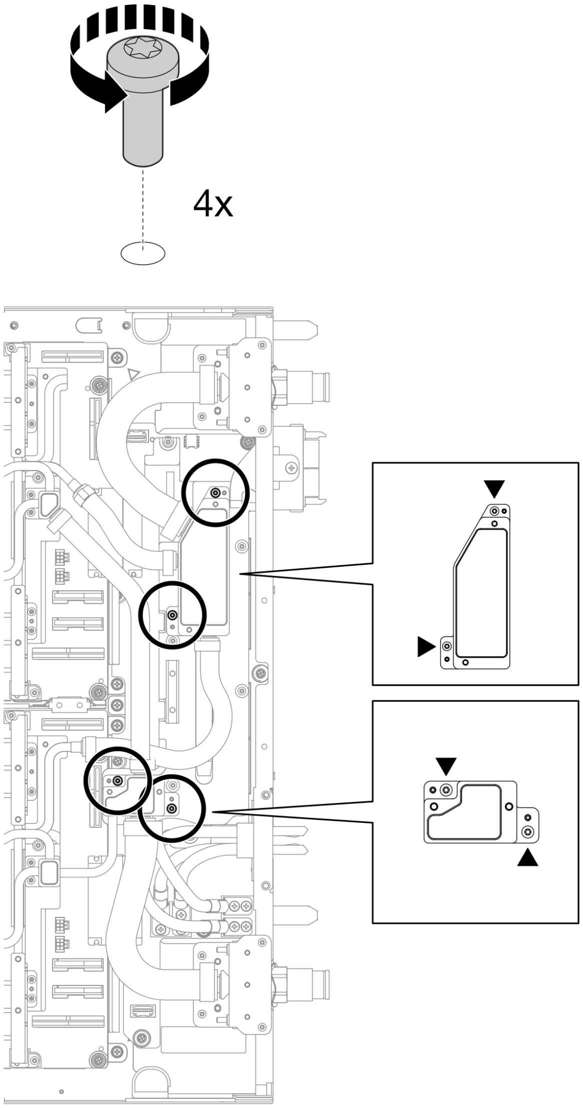


Figure 450. Installing mixing chamber screws

Step 6. Remove water loop screws (18x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

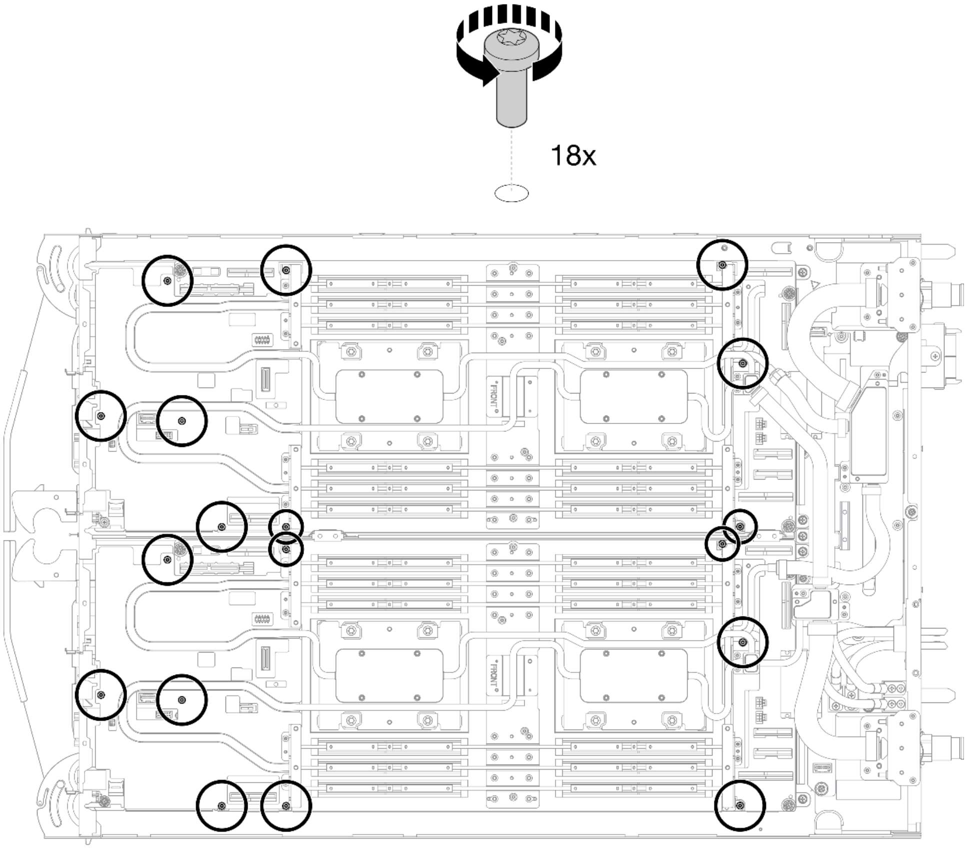


Figure 451. Water loop screws removal

Step 7. Loosen processors properly.

a. ❶ Fully loosen all Torx T30 captive screws on cold plates (16x Torx T30 captive screws for two nodes) following the screw sequence label on the shipping bracket, with a torque screwdriver set to the proper torque.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 8+/- 0.5 lbf-in, 0.9+/- 0.05 N-m.
- To prevent damage to components, make sure that you follow the indicated tightening/ loosening sequence.

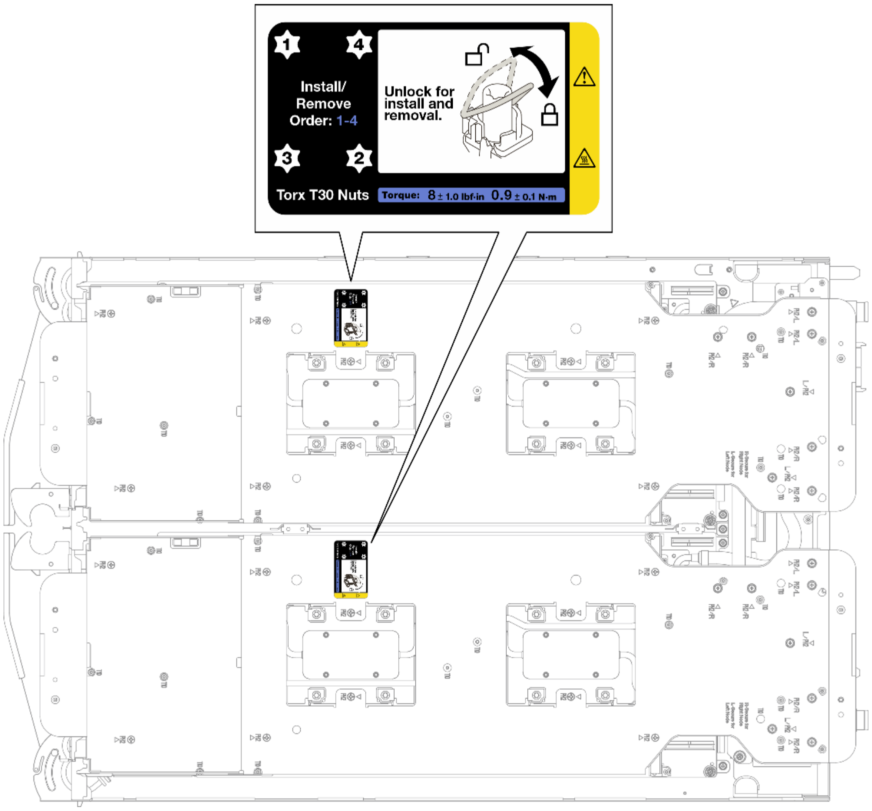


Figure 452. Screw tightening/loosening sequence on the shipping bracket label

b. ② Rotate all anti-tilt wire bails (16x anti-tilt wire bails for two nodes) inwards to the unlocked position.

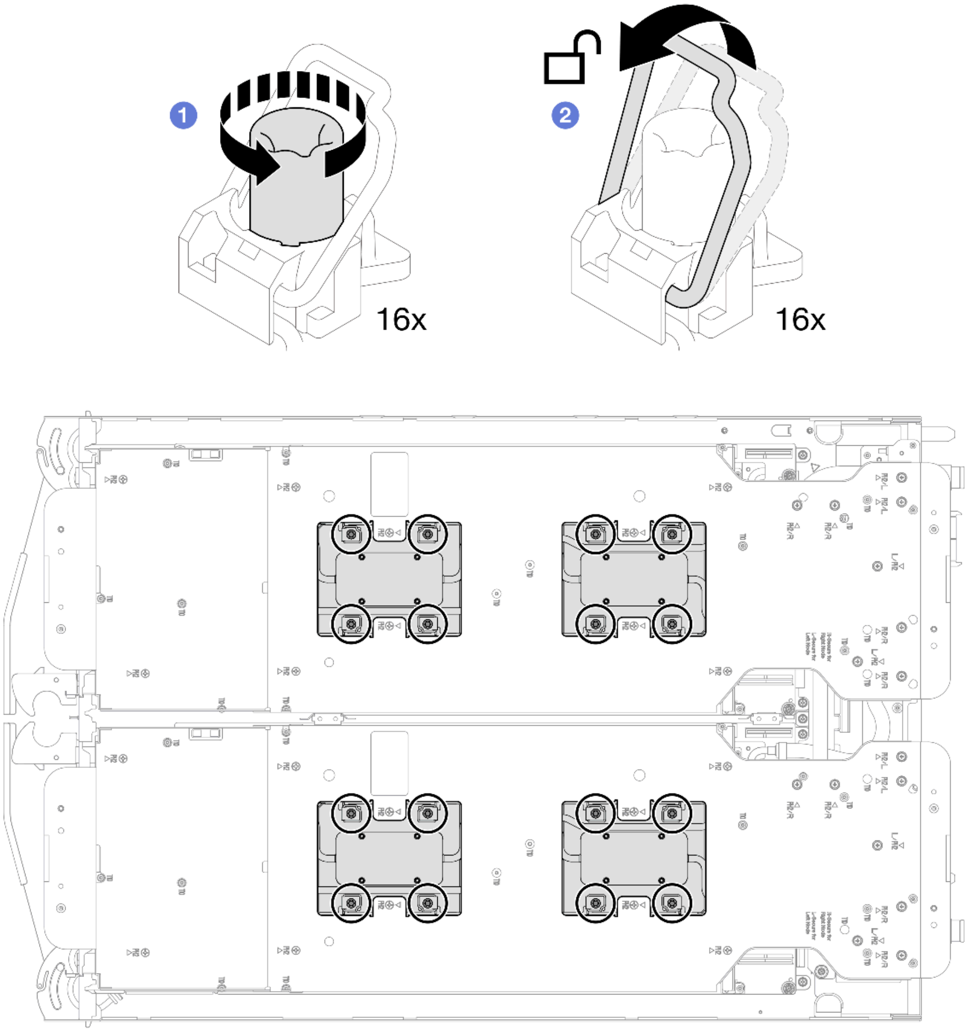


Figure 453. Loosening Torx T30 captive screws

Step 8. Orient two water loop carriers with the guide pins; then, gently put the two water loop carriers down and ensure they are seated firmly on the water loop.

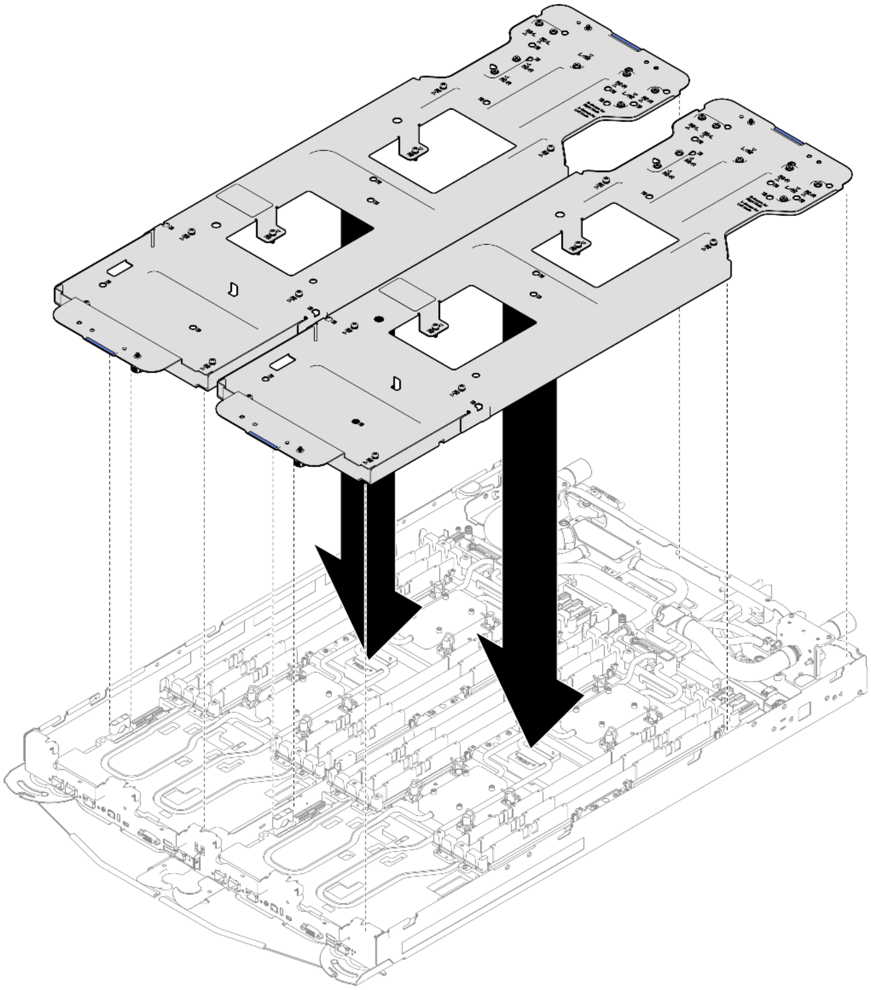


Figure 454. Installing water loop carrier

Step 9. Install water loop carrier screws (28x Phillips #2 screws for two nodes) with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

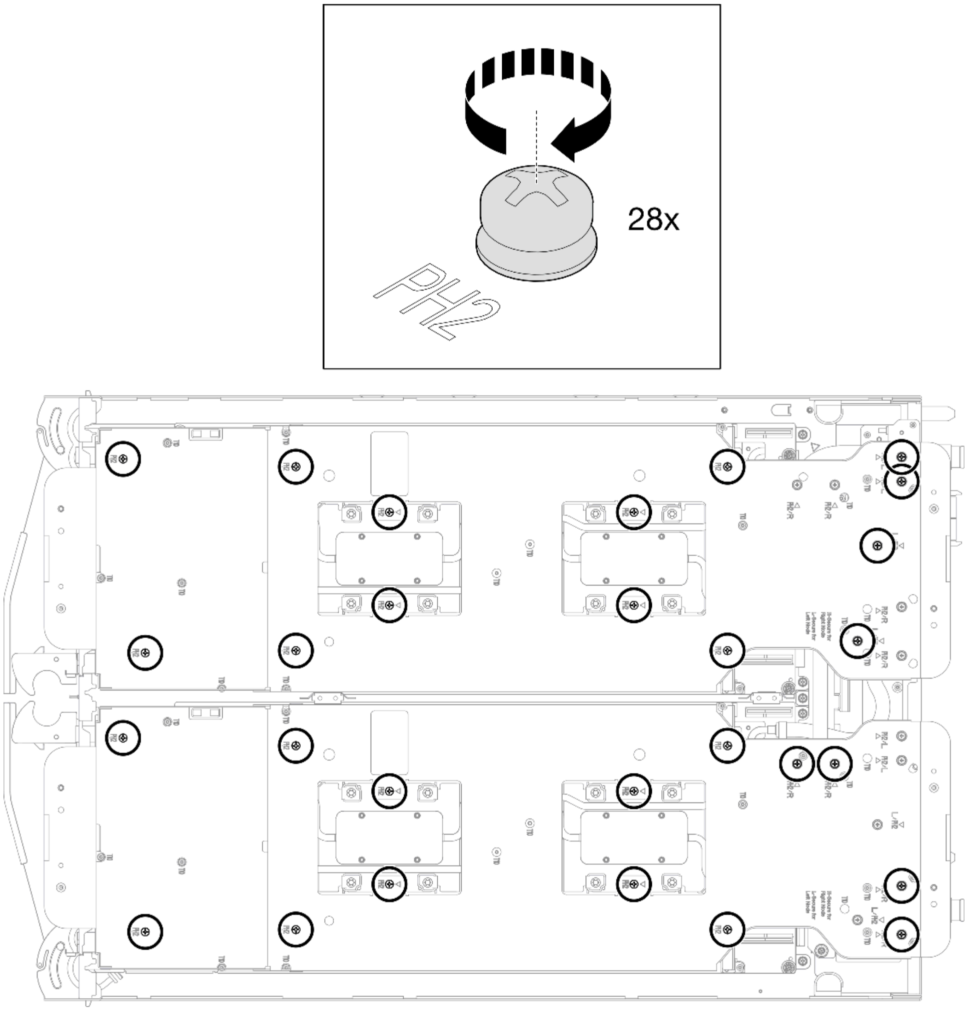


Figure 455. Installing water loop carrier screws

Step 10. Align the support plate with the two guide pins on the shipping bracket; then, place the support plate on the shipping bracket on the right-side node.

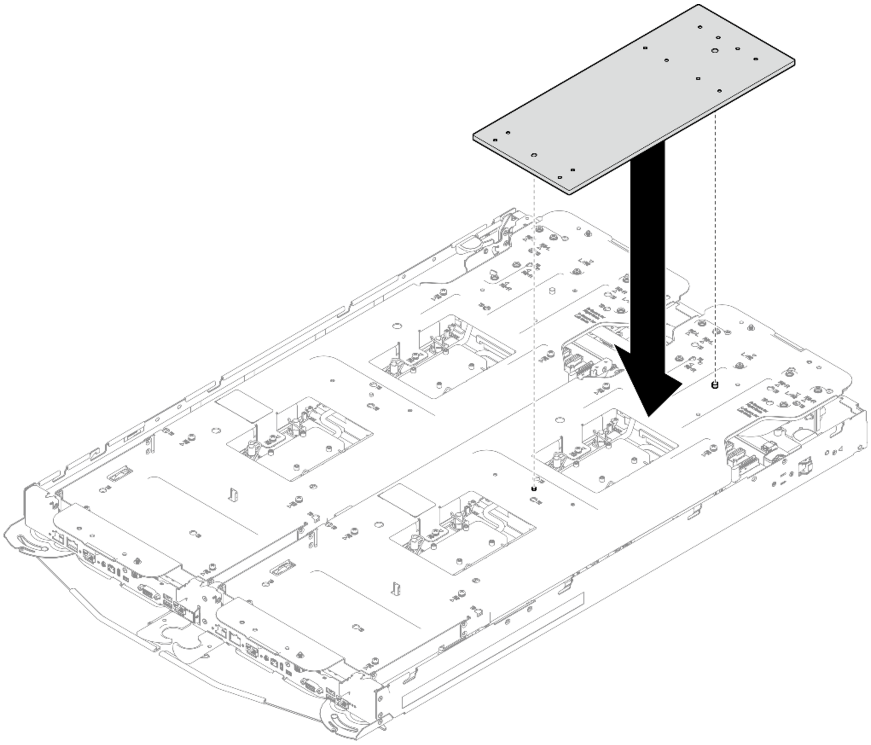


Figure 456. Installing the support plate on the shipping bracket on the right-side node

Step 11. Carefully rotate the water loop so one half is sitting on top of the other half.

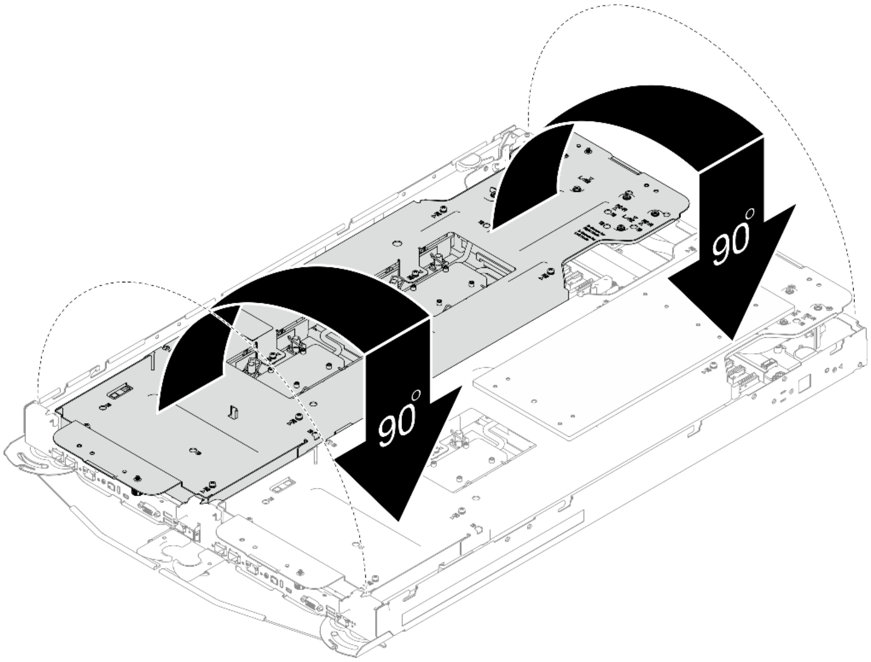


Figure 457. Folding water loop

Step 12. Install six T20 screws to fasten the support plate to the left-side water loop.

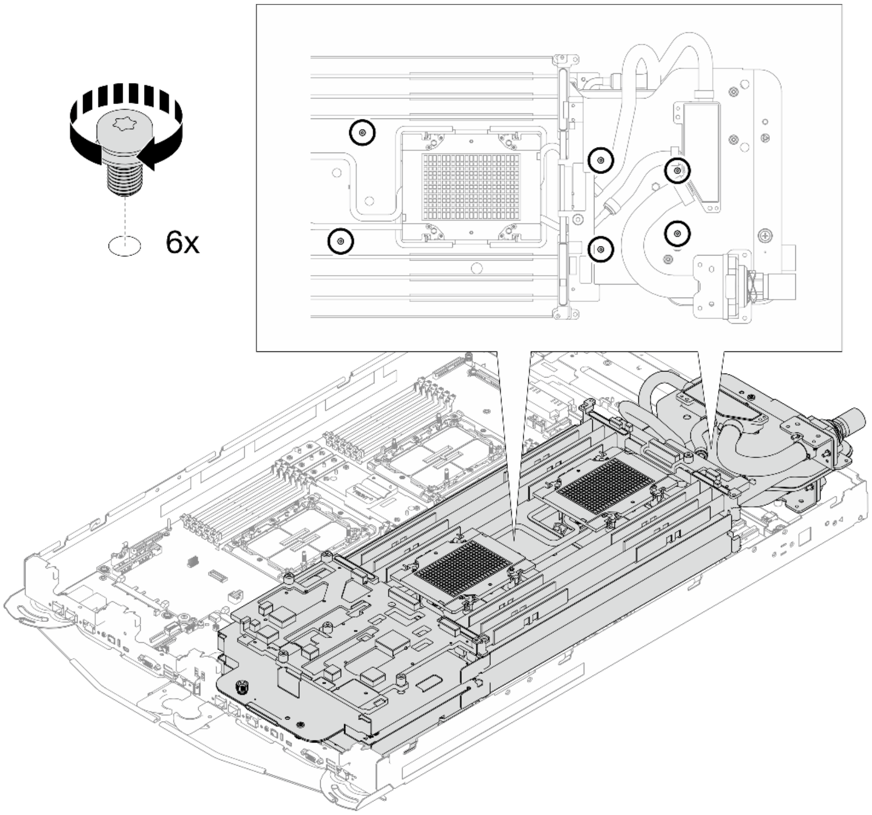


Figure 458. Installing support plate to the left-side water loop

Step 13. Fasten two captive thumbscrews to secure water loop carriers to each other.

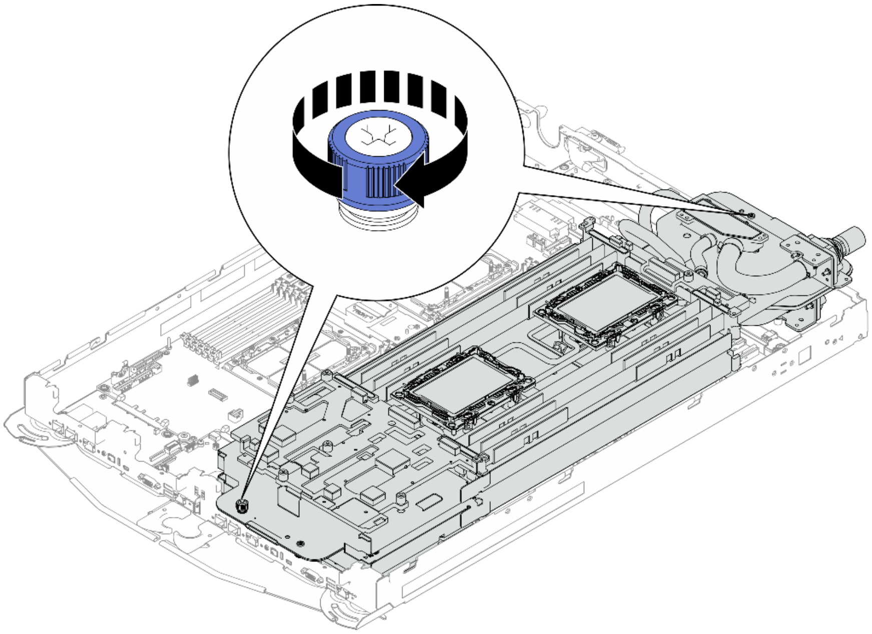


Figure 459. Fastening captive thumbscrews

Step 14. Remove the processor from the retainer.

a. ❶ Lift the handle to release the processor from the retainer.

b. ❷ Carefully hold the processor by its edges; then, lift the processor from the retainer.

Note: Do not touch the contacts on the processor.

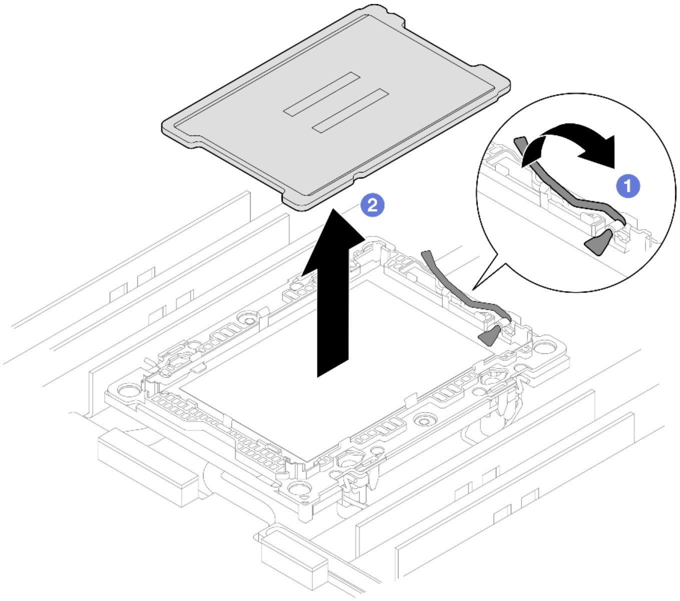


Figure 460. Processor removal

Step 15. Without putting the processor down, wipe the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

Step 16. Remove the processor retainer from the underside of the cold plate.

Note: The processor retainer will be discarded and replaced with a new one.

a. ❶ Carefully release the retaining clips from the cold plate.

b. ❷ Lift the retainer from the cold plate.

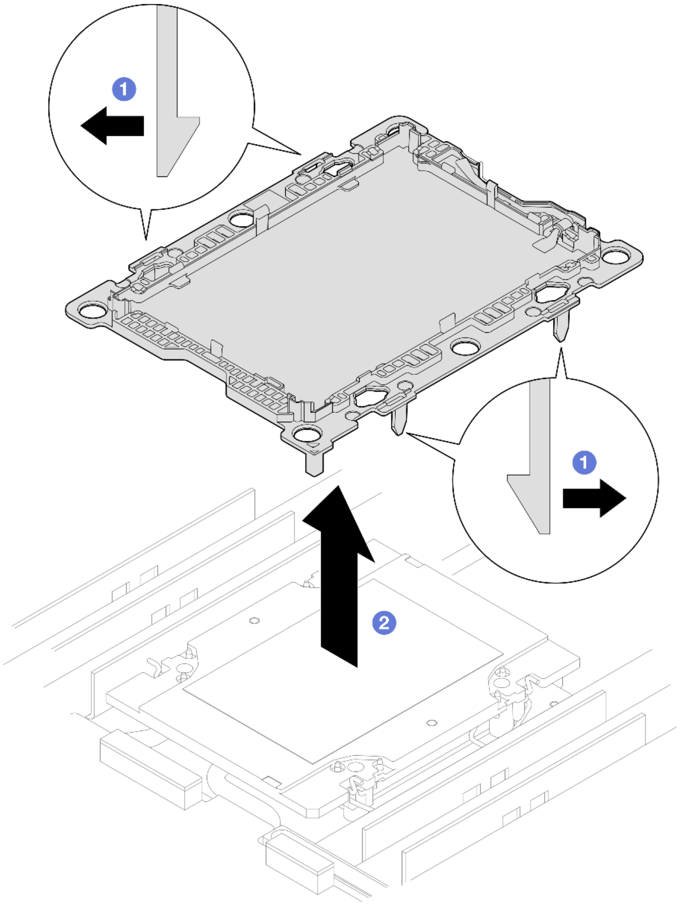


Figure 461. Processor retainer removal

Step 17. Wipe the thermal grease from the bottom of the cold plate with an alcohol cleaning pad.

Step 18. Carefully lift the water loop up off the system board and out of the node.

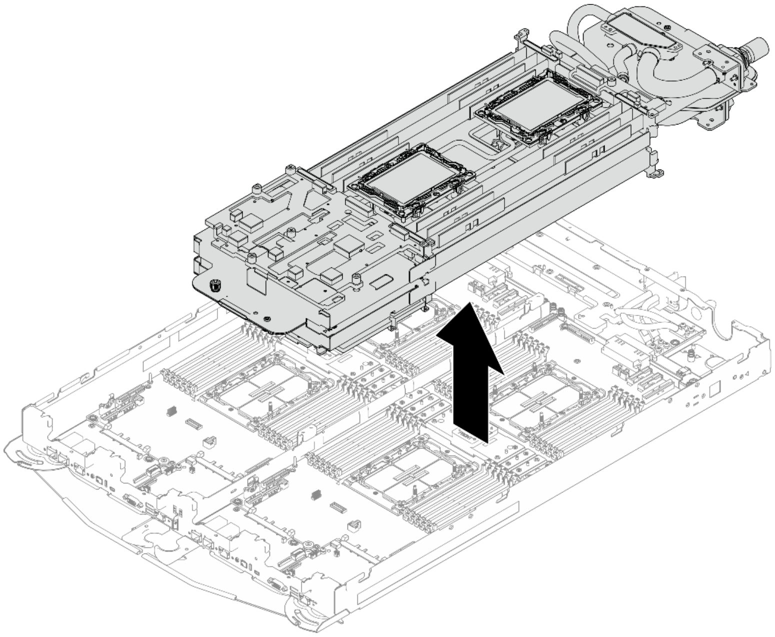


Figure 462. Water loop removal

Step 19. Place the water loop into the package box.; then, place it into the package box.

a. ❶ Carefully hold the water loop with both hands and flip it.

b. ❷ Place the water loop into the package box.

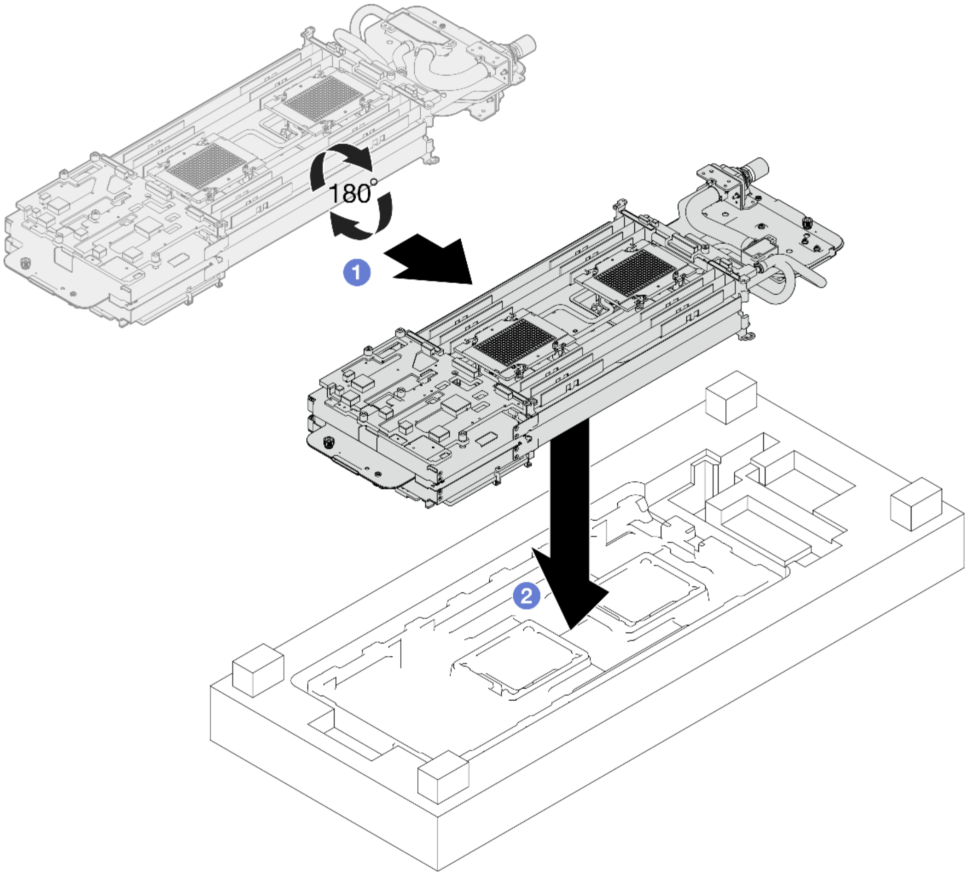


Figure 463. Place the water loop into the package box

Step 20. While the water loop is inside the package box, install six T20 screws to fasten the support plate to the right-side water loop.

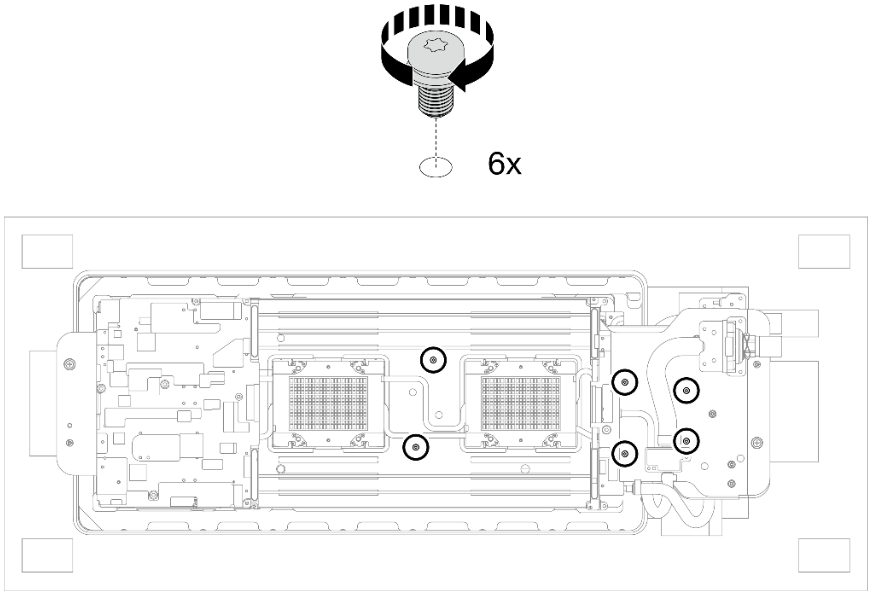


Figure 464. Installing support plate to right-side water loop

Step 21. Fasten two captive thumbscrews to secure water loop carriers to each other.

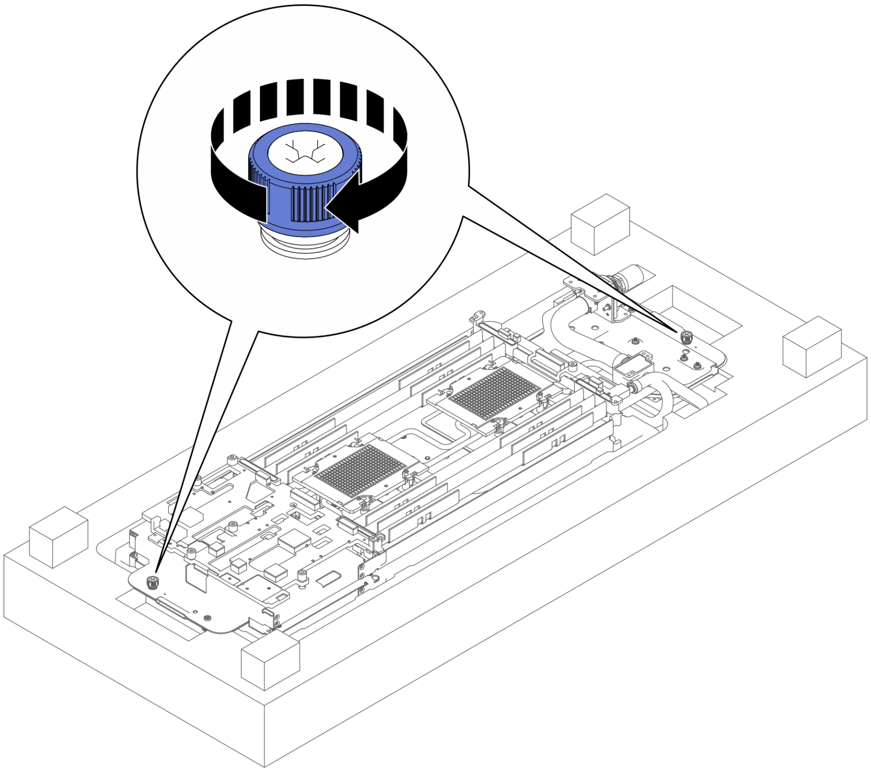


Figure 465. Fastening captive thumbscrews

Step 22. Remove the processor from the retainer.

a. ❶ Lift the handle to release the processor from the retainer.

b. ❷ Carefully hold the processor by its edges; then, lift the processor from the retainer.

Note: Do not touch the contacts on the processor.

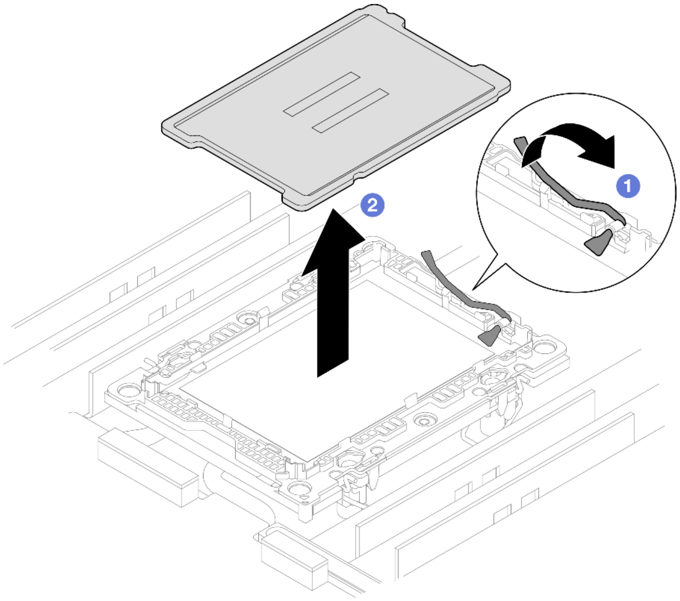


Figure 466. Processor removal

Step 23. Without putting the processor down, wipe the thermal grease from the top of the processor with an alcohol cleaning pad; then, place the processor on a static protective surface with the processor-contact side up.

Step 24. Remove the processor retainer from the underside of the cold plate.

Note: The processor retainer will be discarded and replaced with a new one.

a. ❶ Carefully release the retaining clips from the cold plate.

b. ❷ Lift the retainer from the cold plate.

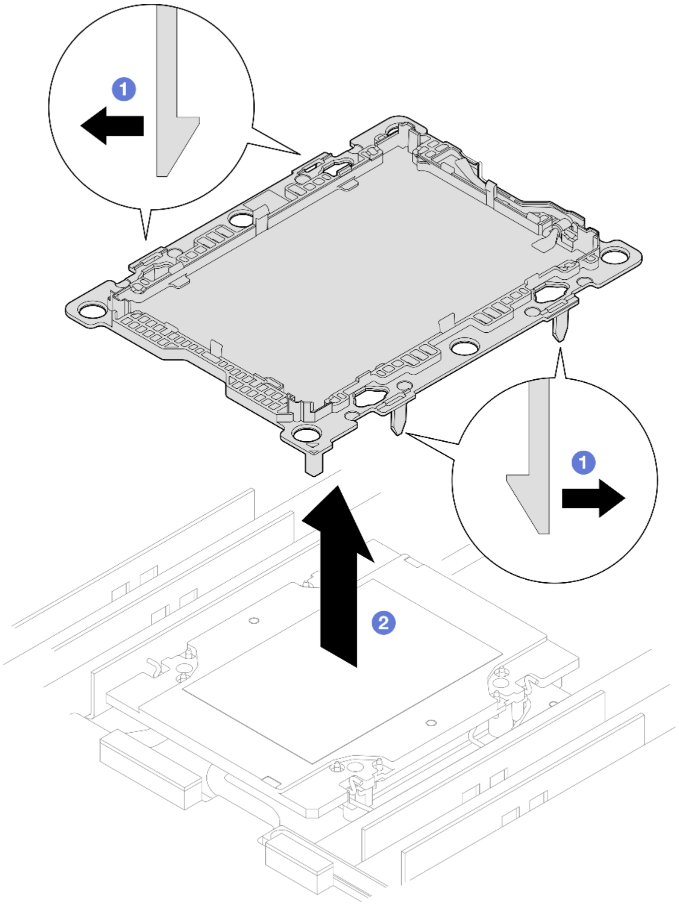


Figure 467. Processor retainer removal

Step 25. Wipe the thermal grease from the bottom of the cold plate with an alcohol cleaning pad.

Step 26. Install the foam cover and plastic cover to the water loop.

a. ❶ .Install the plastic cover to the water loop.

b. ❷ Install the foam cover to the water loop

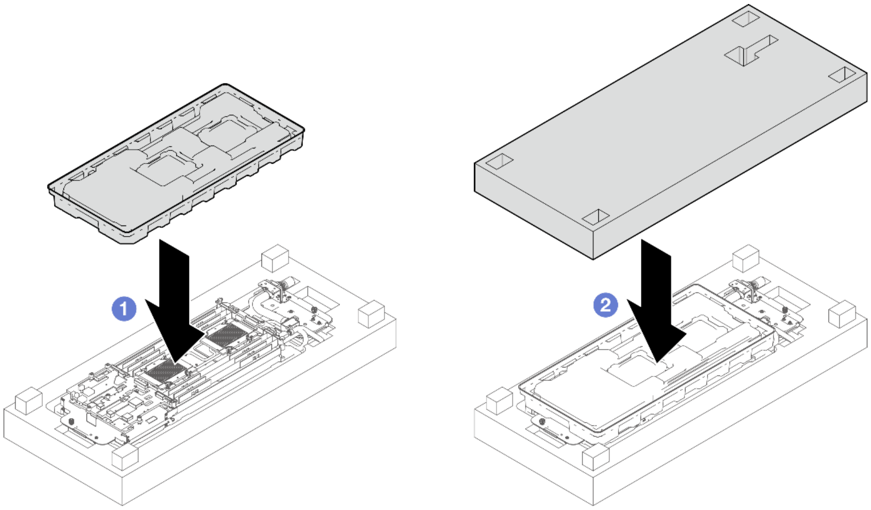


Figure 468. Install protective covers to the water loop

After you finish

If you are instructed to return the component or optional device, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Install the water loop

Use this information to install the water loop to the tray.

About this task

Required tools

- Screwdriver for PH 1, PH 2, T10, T20, and T30 screws
- Waterloop Service Kit (SC750 V4) (The water loop carrier in the Service Kit is reusable, it is recommended to keep it at the facility where the server operates for future replacement needs.)
- Up VR Gap Pad Kit (SC750 V4)
- MID E3.S TOP Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- MID E3.S BOT Gap Pad (SC750 V4) , if E3.S middle drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S front drive is installed.
- Storage Gap Pad Kit (SC750 V4) , if E3.S 1T dual front drives or E3.S 2T single front drive are installed.
- CX7 NDR200 Gap Pad (SC750 V4) , if ConnectX-7 NDR 200 adapter is installed.
- CX7 Gap Pad (SC750 V4) , if ConnectX-7 NDR 400 adapter is installed.

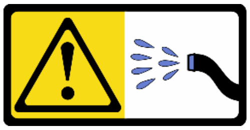
S038

CAUTION:
Eye protection should be worn for this procedure.

S040

CAUTION:
Protective gloves should be worn for this procedure.

S042



⚠**DANGER**

Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present.

Important: Gap pad replacement guidelines

- For gap pad location and instruction, see "Gap pad identification and location" on page 40.
- Before replacing the gap pad, gently clean the surface with an alcohol cleaning pad.
- Hold the gap pad carefully to avoid deformation. Make sure no screw hole or opening is blocked by the gap pad material.

Attention:

- Read "Installation Guidelines" on page 33 and "Safety inspection checklist" on page 34 to ensure that you work safely.
- Turn off the corresponding DWC tray that you are going to perform the task on.
- Disconnect all external cables from the enclosure.
- Use extra force to disconnect QSFP cables if they are connected to the solution.
- To avoid damaging the water loop, always use the water loop carrier when removing, installing or folding the water loop.
- A torque screwdriver is available for request if you do not have one at hand.

Watch the procedure

A video of this procedure is available at YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-BsqLuEv5it7moWuIuRw0g8.

Procedure

Attention: Make sure that the retaining clips on all memory module connectors are in the locked position.

Step 1. Open the package box and remove protective covers from the water loop.

a. ① Remove the foam cover from the water loop.

b. ② Remove the plastic cover from the water loop.

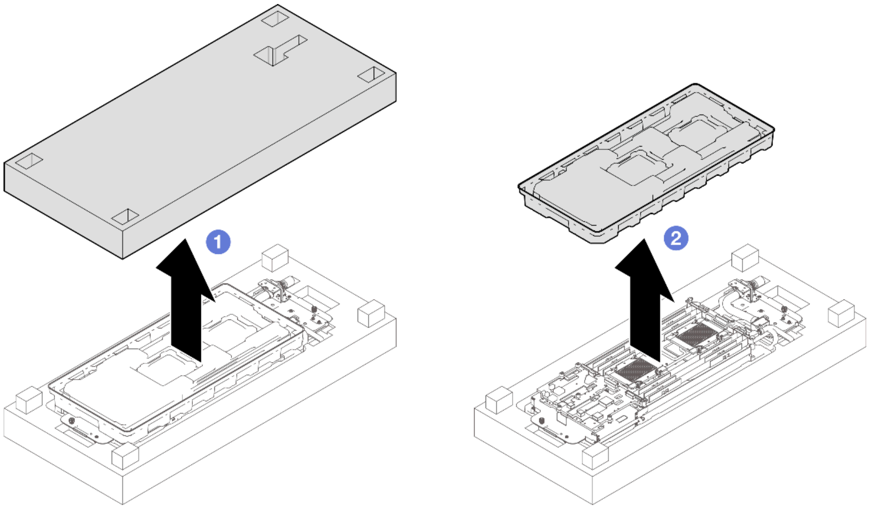


Figure 469. Removing protective covers from the water loop

Step 2. Loosen the six T20 screws from the water loop while the water loop is still in the package box.

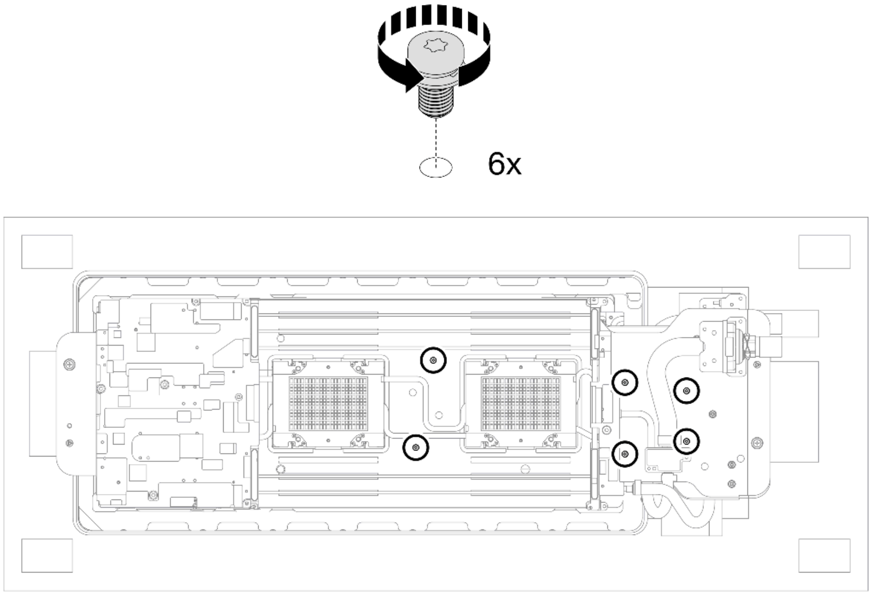


Figure 470. Removing six screws from the water loop in the package box

Step 3. Clean the thermal grease on processors and water loop processor cold plate.

a. Gently clean the old thermal grease on processors and the processor cold plate on water loop using an alcohol cleaning pad.

b. Remove the processor identification label from the water loop and replace it with the new label that comes with the replacement processor. If you are unable to remove the label and place it on the new water loop, or if the label is damaged during transfer, write the processor serial number from the processor identification label on the new water loop in the same location as the label would be placed using a permanent marker.

c. Apply the thermal grease on the top of the processor with syringe by forming four uniformly spaced dots, while each dot consists of about 0.1 ml of thermal grease

Note: Carefully place the processor and retainer on a flat surface with the processor-contact side down.

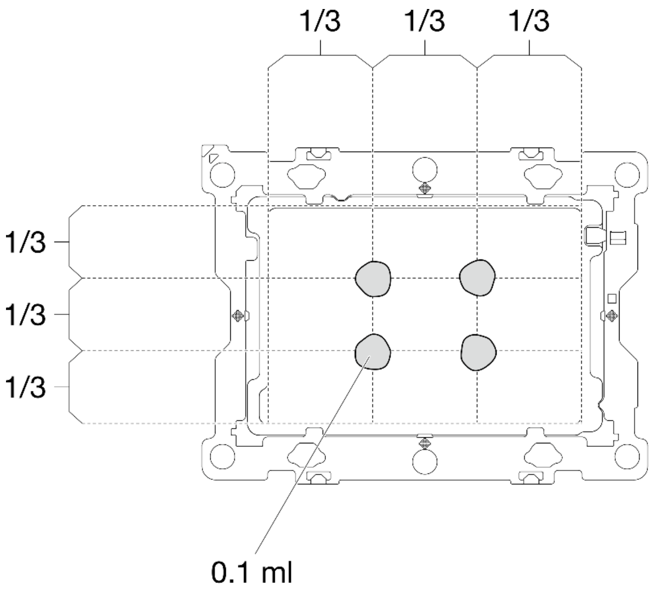


Figure 471. Thermal grease application

Step 4. Install processor retainers onto processor if needed.

a. Align the triangular mark on the processor retainer with the triangular mark on the processor corner edge.

b. Gently place the processor retainer on the processor; then, carefully press the four sides of the processor retainer to secure the processor.

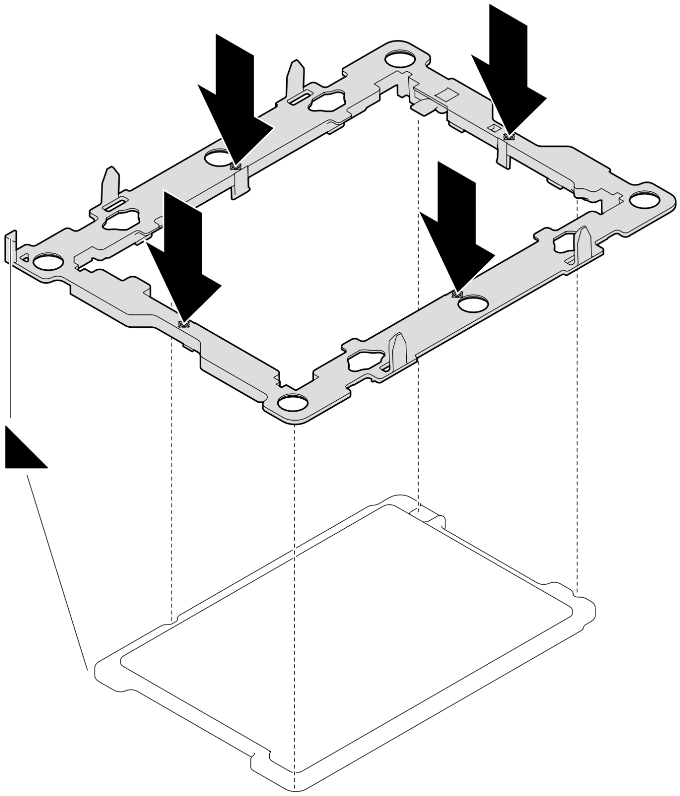


Figure 472. Installing a processor retainer

Step 5. Install processor to the water loop while the water loop is still in the package box.

a. Align the triangular marks on the processor retainers with the triangular slots on the underside of the water loop cold plate; then, attach the processors to the underside of the water loop cold plate by inserting the processor retainer posts and clips features into the openings at the four corners of the cold plate.

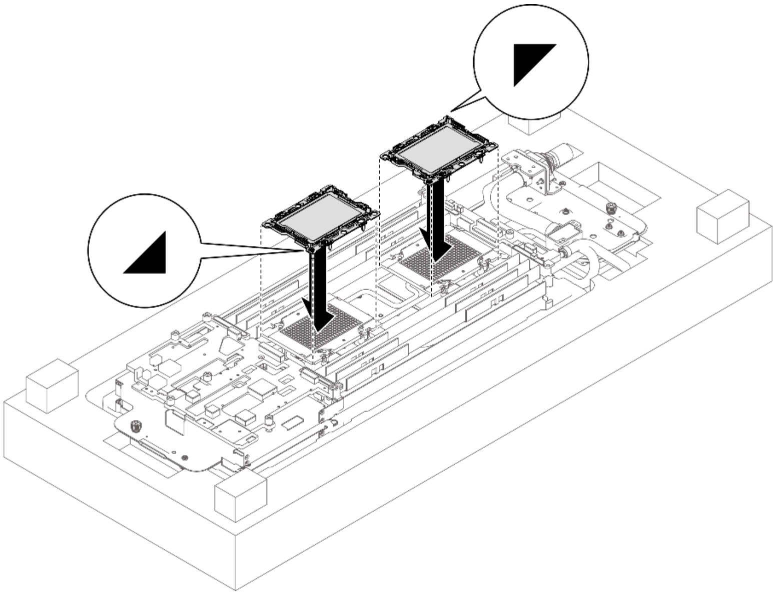


Figure 473. Installing processor to the water loop

b. Rotate all anti-tilt wire bails (8x anti-tilt wire bails per node) outwards to the unlocked position.

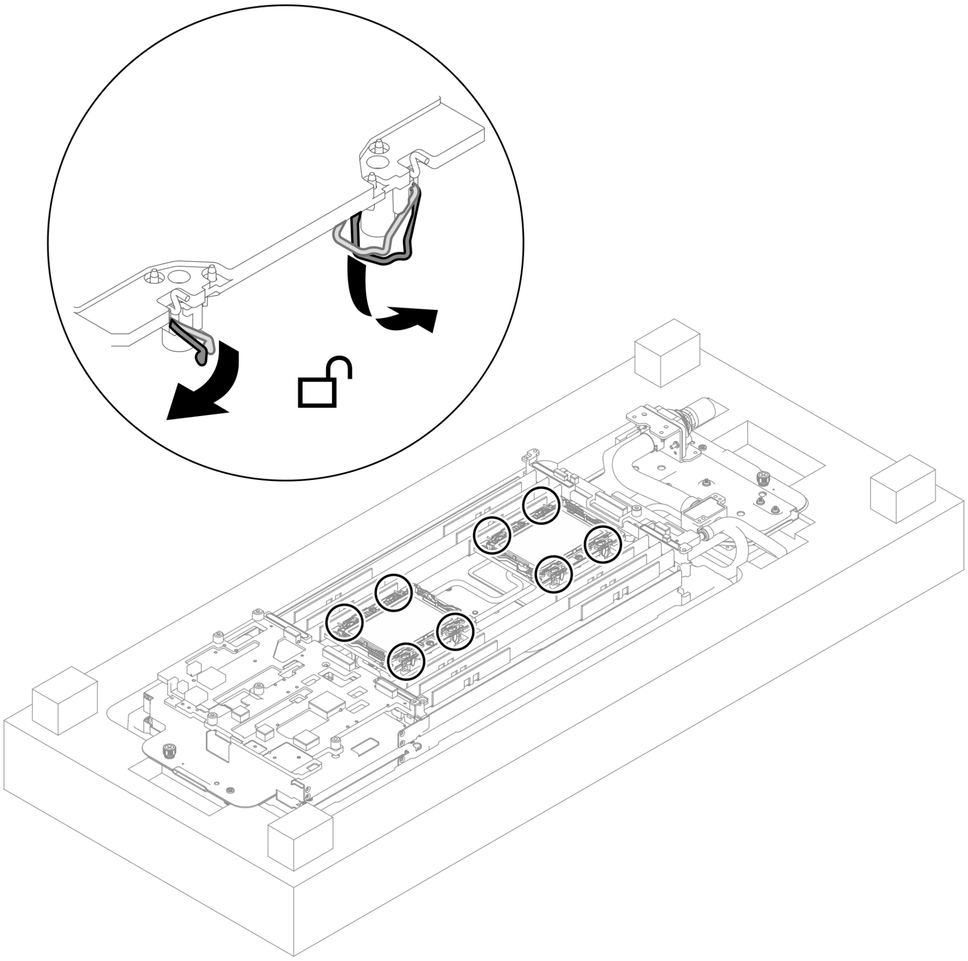


Figure 474. Unlock Torx T30 captive screws

Step 6. Remove the water loop from the package box. **Make sure** to hold the touch points marked in grey in the illustration below.

Attention: Holding the water loop anywhere other than the touch points may cause damage to it.

Top image	Isometric view of water loop
Bottom image	Top view of the water loop

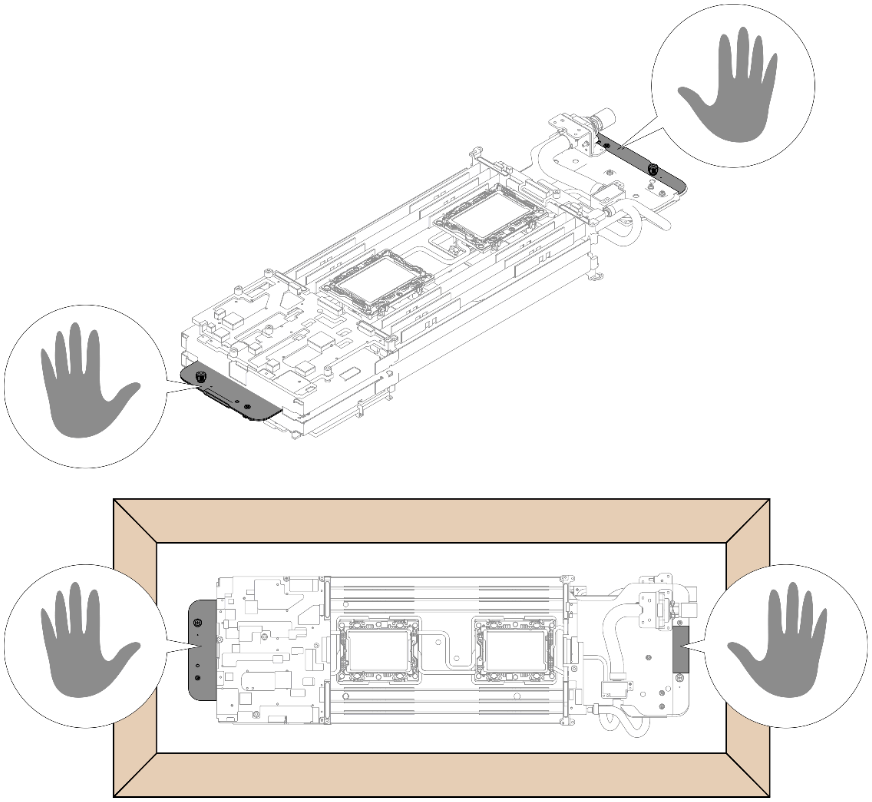


Figure 475. Touching points when removing water loop from package box

Attention: Before installing the water loop to the tray, keep the water loop standing vertically. If the water loop is placed horizontally and touches the working surface, the gap pads may be damaged.

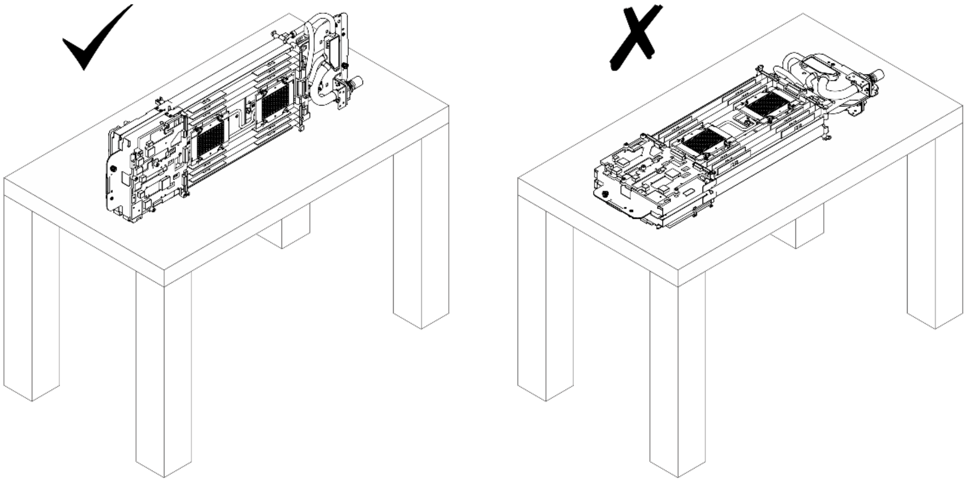


Figure 476. Handling water loop before installing it to the tray

Step 7. Check the gap pads on the water loop, if any of them are damaged or detached, replace them with new ones.

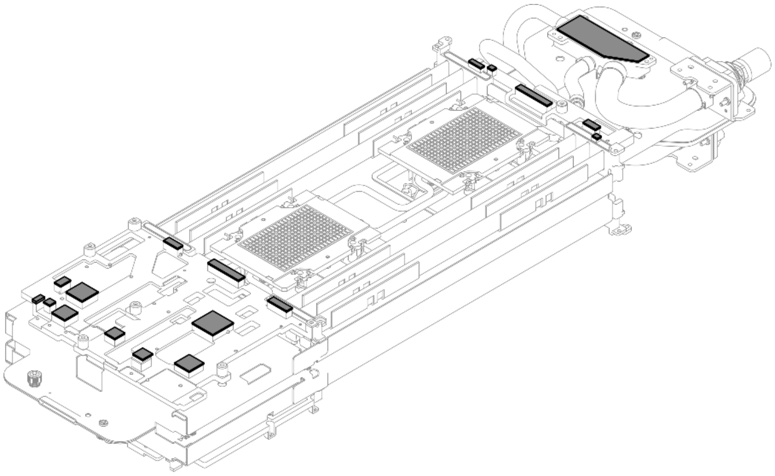


Figure 477. Water loop gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 8. Check the gap pads on the VR cold plate installed on the processor board, if any of them are damaged or detached, replace them with new ones.

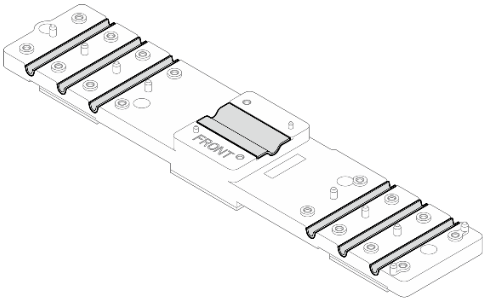


Figure 478. VR cold plate gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 9. Install the water loop to the **right-side node** (when viewed from the tray front).

a. ❶ Carefully hold the water loop with both hands and flip it.

b. ❷ Carefully position the water loop onto three guide pins of the **right-side node** (when viewed from the tray front); then, gently lower down the water loop and ensure it is seated firmly on the system board.

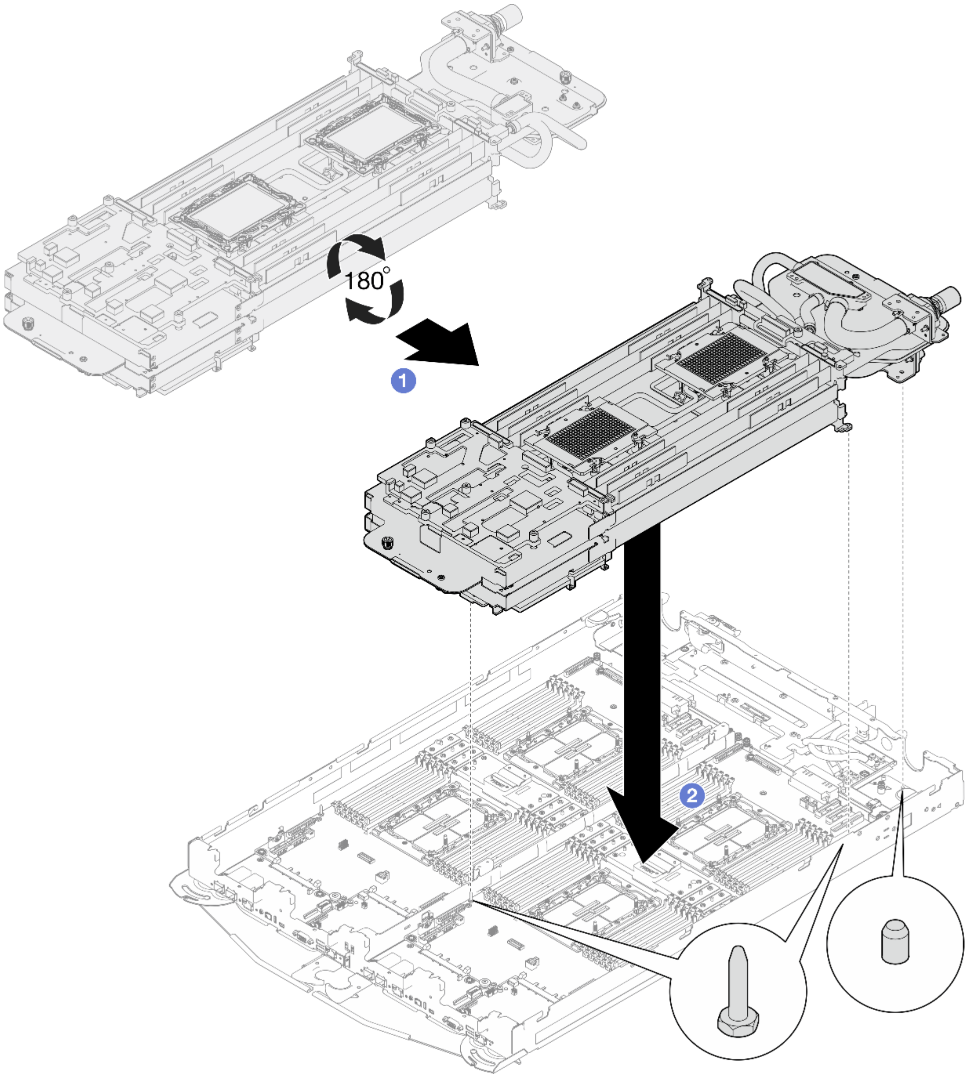


Figure 479. Install water loop to the right-side node

Step 10. Make sure the guide pin near the quick connect slot is properly installed. When properly installed, the guide pin should be inserted through the guide hole and is visible. When installed incorrectly, the guide pin is not seen and the water loop is slightly floating above the tray.

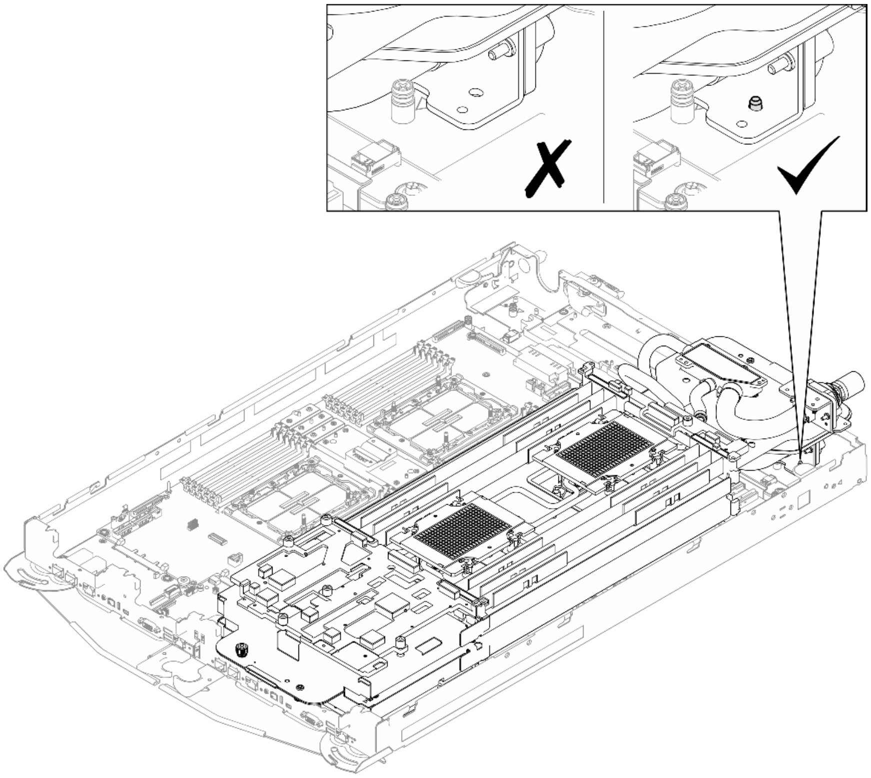


Figure 480. Checking guide pin installation result

a. ① If the guide pin is not properly installed, press down the water loop.

b. ② The guide pin should be inserted into the guide hole.

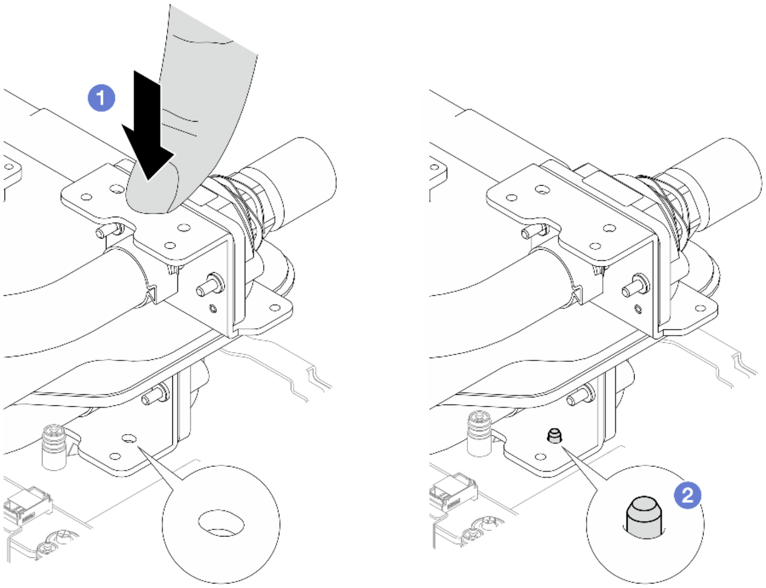


Figure 481. Fixing incorrectly installed guide pin

Step 11. Fully loosen two captive thumbscrews located at each end of the water loop carrier.

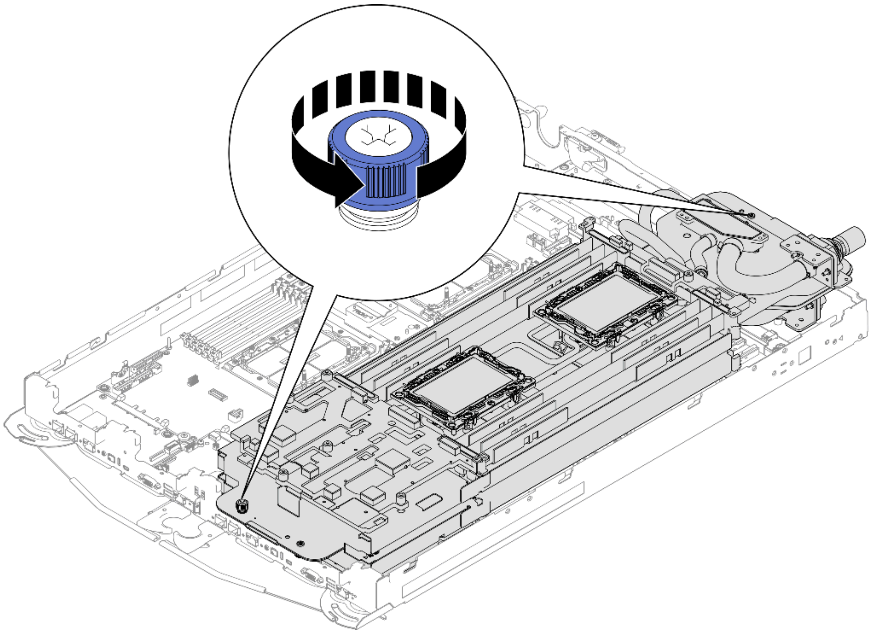


Figure 482. Loosening captive thumbscrews

Step 12. Remove the six T20 screws from the water loop.

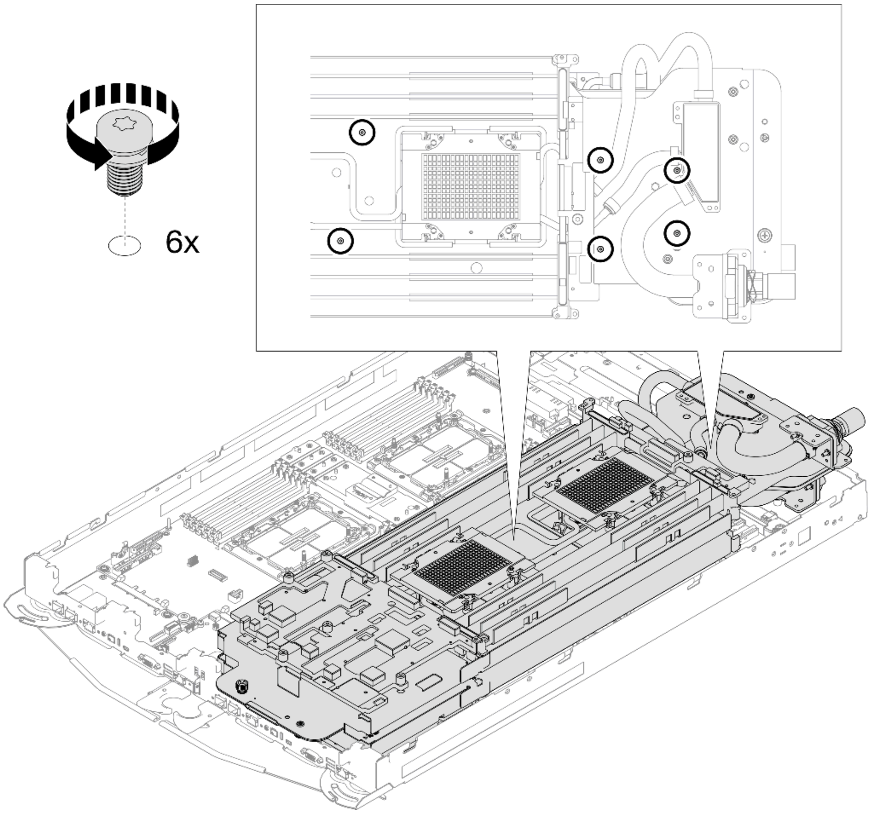


Figure 483. Removing six screws from the water loop

Step 13. **Repeat step 4 to step 5 to install processors to the other side of the water loop.**

Step 14. Check the gap pads on the water loop, if any of them are damaged or detached, replace them with new ones.

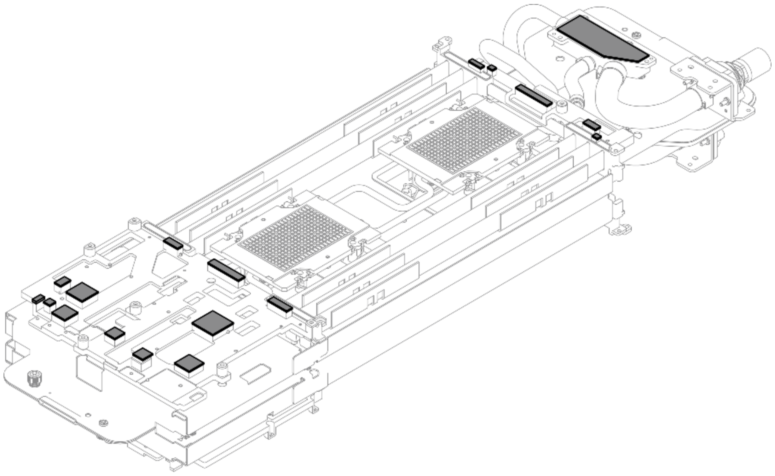


Figure 484. Water loop gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 15. Check the gap pads on the VR cold plate installed on the processor board, if any of them are damaged or detached, replace them with new ones.

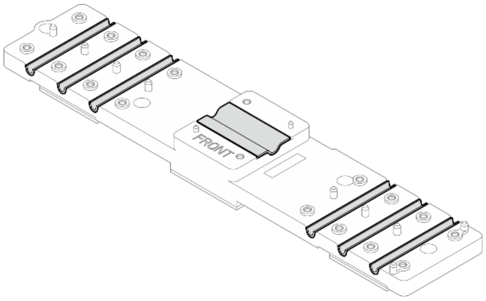


Figure 485. VR cold plate gap pads locations

Make sure to follow Gap pad replacement guidelines.

Step 16. Unfold and install the other side of the water loop as shown.

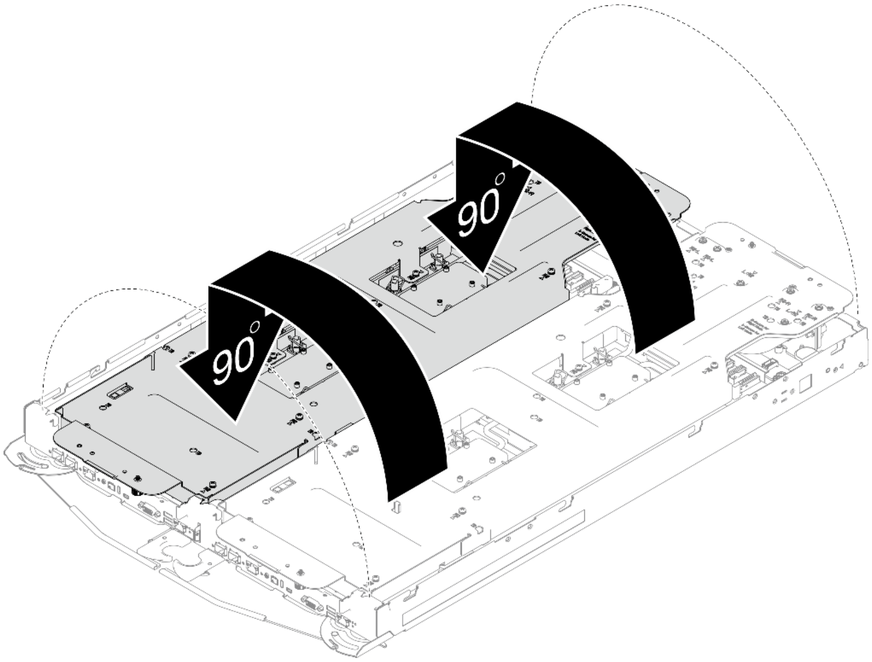


Figure 486. Unfolding water loop

Step 17. Remove the support plate form the water loop.

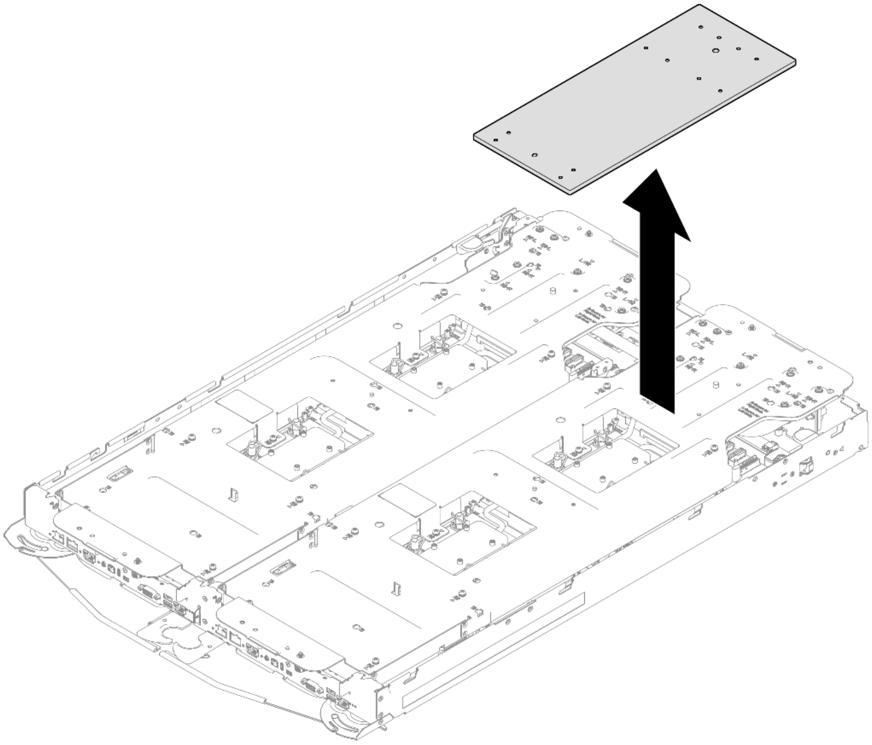


Figure 487. Removing the support plate from the water loop.

Step 18. Make sure the guide pin near the quick connect slot is properly installed. When properly installed, the guide pin should be inserted through the guide hole and is visible. When installed incorrectly, the guide pin is not seen and the water loop is slightly floating above the tray.

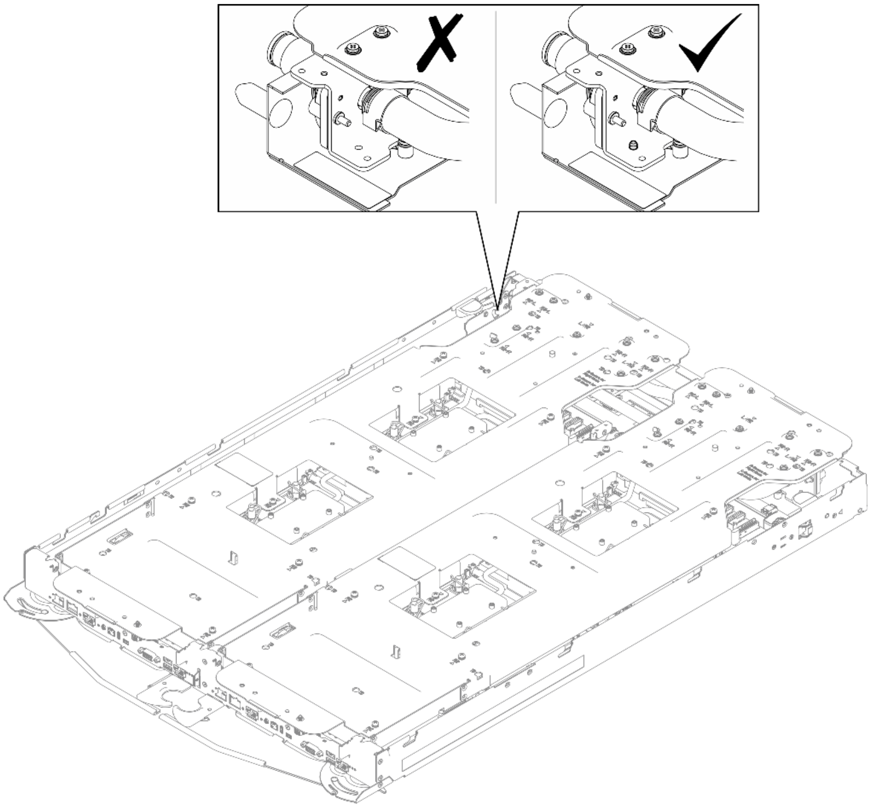


Figure 488. Checking guide pin installation result

a. ① If the guide pin is not properly installed, press down the water loop.

b. ② The guide pin should be inserted into the guide hole.

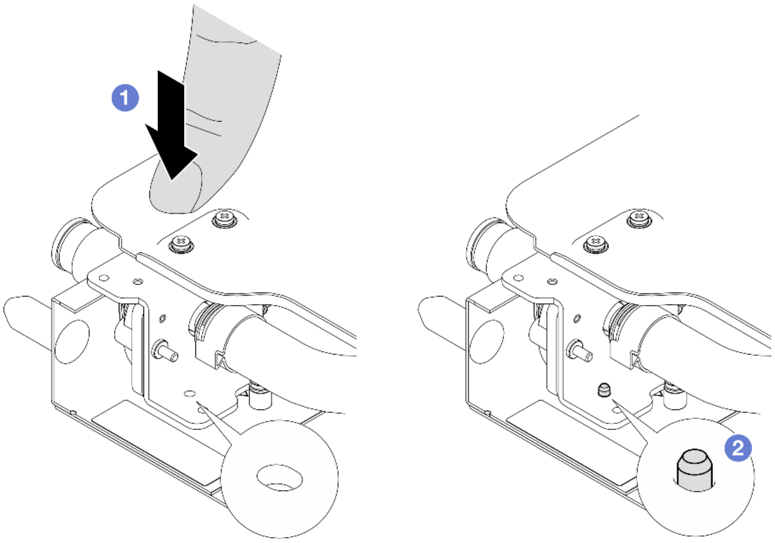


Figure 489. Fixing incorrectly installed guide pin

Step 19. Install the screw to secure the mixing chamber to the tray through the screw hole on the shipping bracket.

a. ❶ Locate the screw hole on the shipping bracket on the **right-side node** (when viewed from tray front).

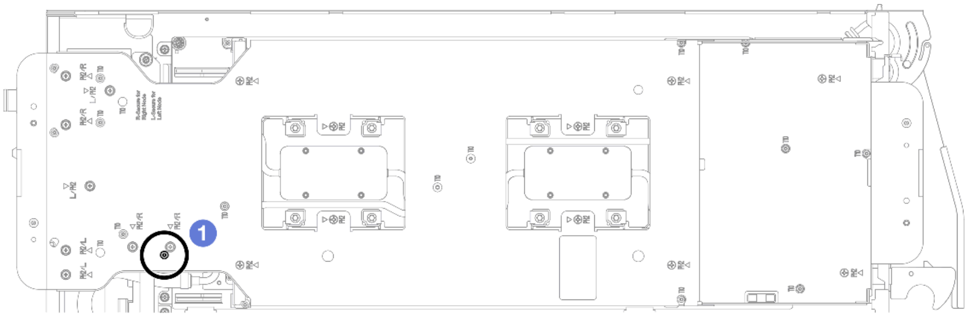


Figure 490. Location of the mixing chamber screw hole on the shipping bracket

b. ❷ Inspect the space beneath the screw hole, where two water tubes are layered. There is a metal clip on the top tube; the bottom tube should *not* contact the metal clip. Adjust the bottom tube until the bottom tube is clear off the metal clip.

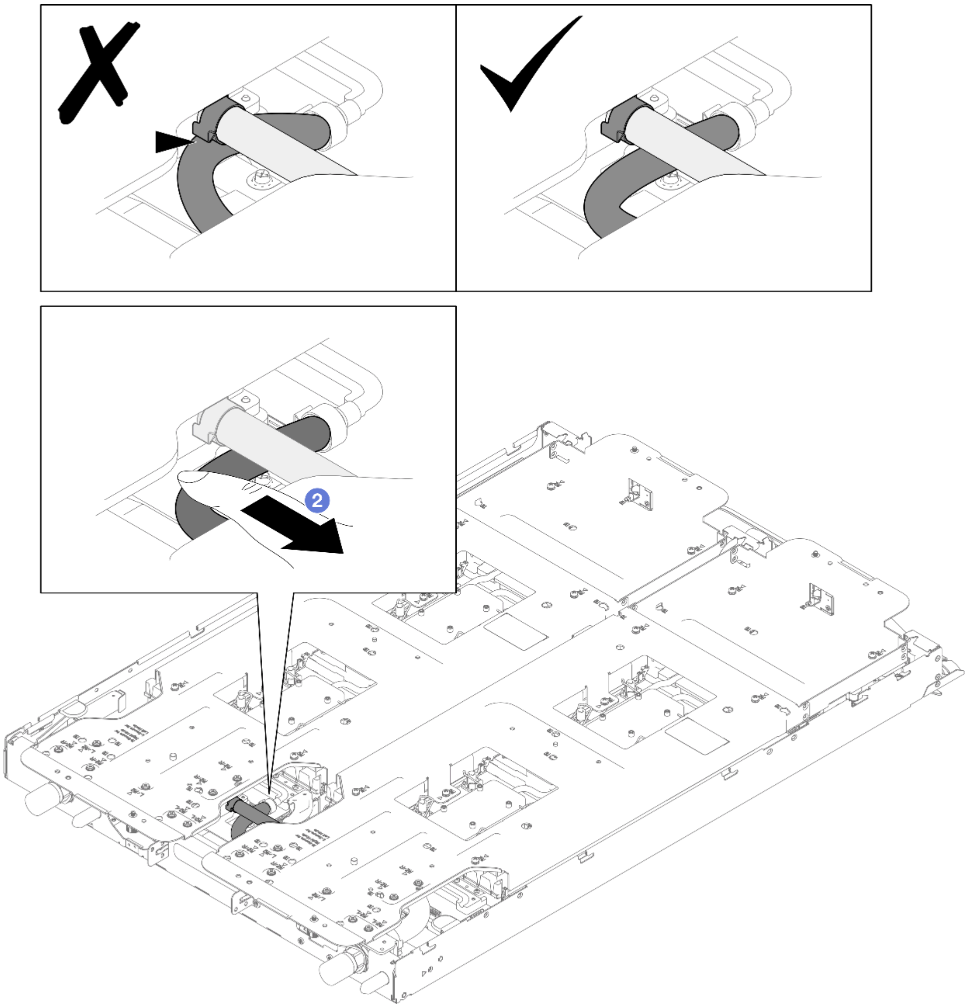


Figure 491. Adjust the bottom tube to be clear off the metal clip

Note: There is a L-shape slant section on the PDB cold plate that allows more space for the bottom tube. The L-shape slant section is specified in the illustration below. Make sure to keep the bottom tube within the slant section.

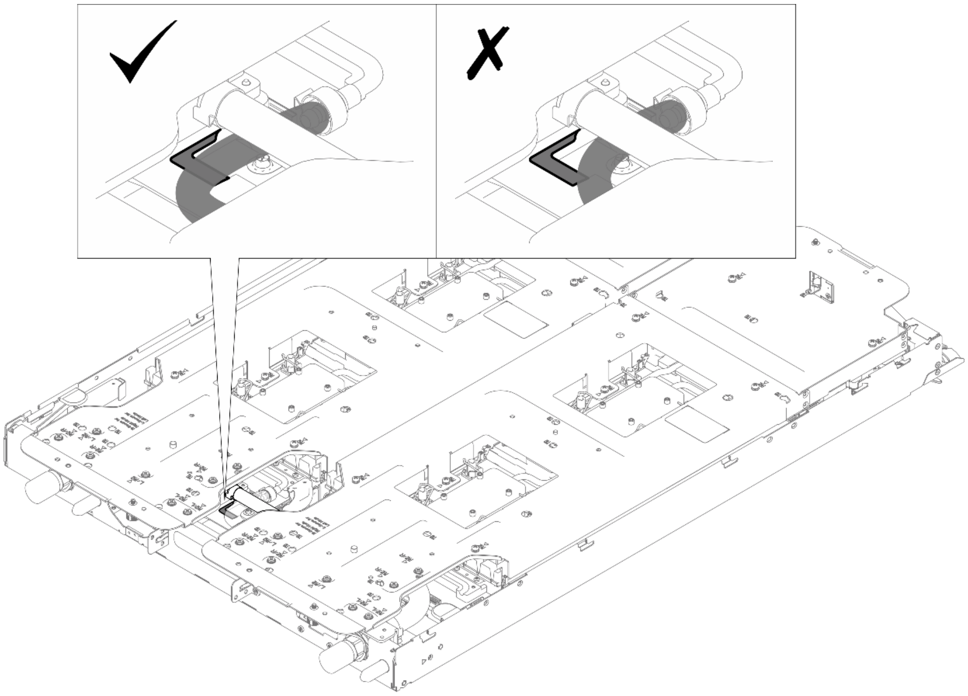


Figure 492. Keeping bottom tube within the slant on PDB cold plate

c. ❸ Keep the bottom tube clear off the metal clip of top tube, and **at the same time**, install the screw through the screw hole on the shipping bracket to secure the mixing chamber to the tray.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/-0.5 lbf-in, 0.55+/- 0.05 N-M.

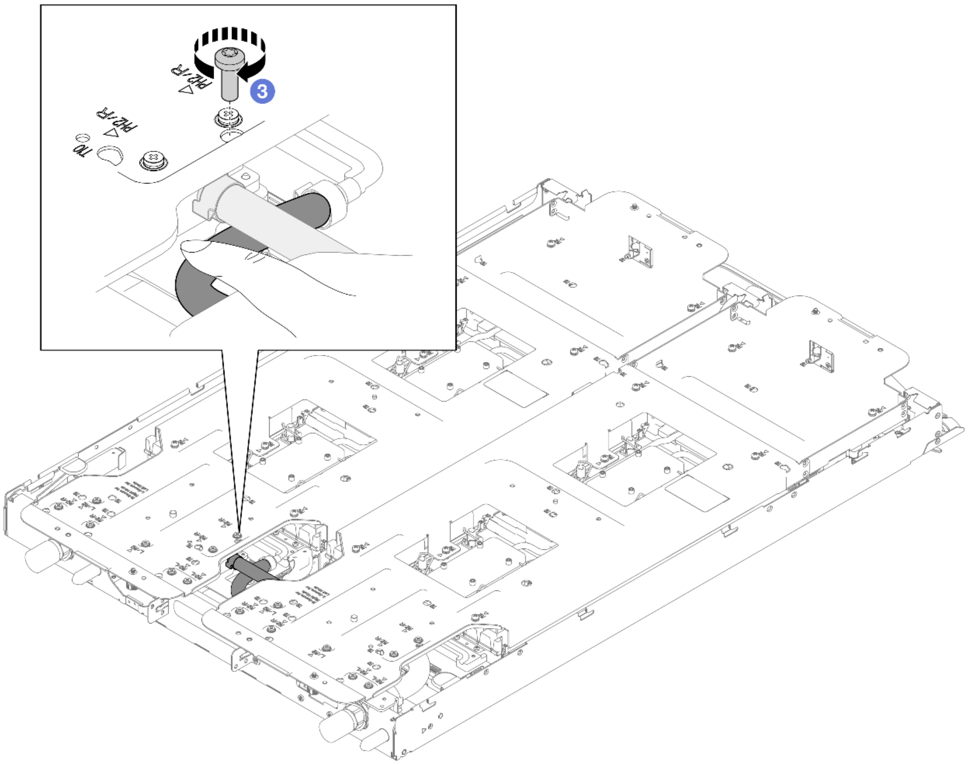


Figure 493. Installing the screw to secure the mixing chamber

Step 20. Rotate anti-tilt wire bails (16x anti-tilt wire bails for two nodes) outwards to the locked position.

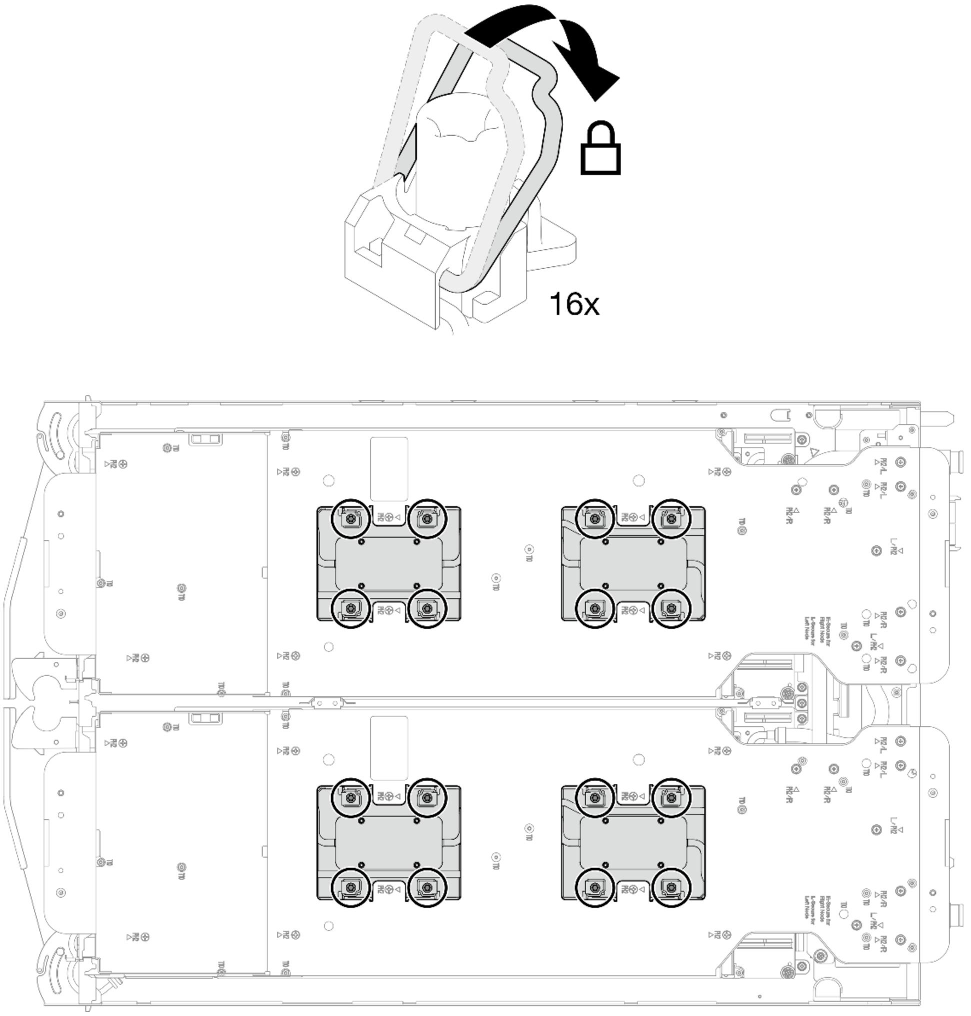


Figure 494. Unlocking the anti-tilt wire bails

Step 21. Loosen water loop carrier screws (28x Phillips #2 screws for two nodes).

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

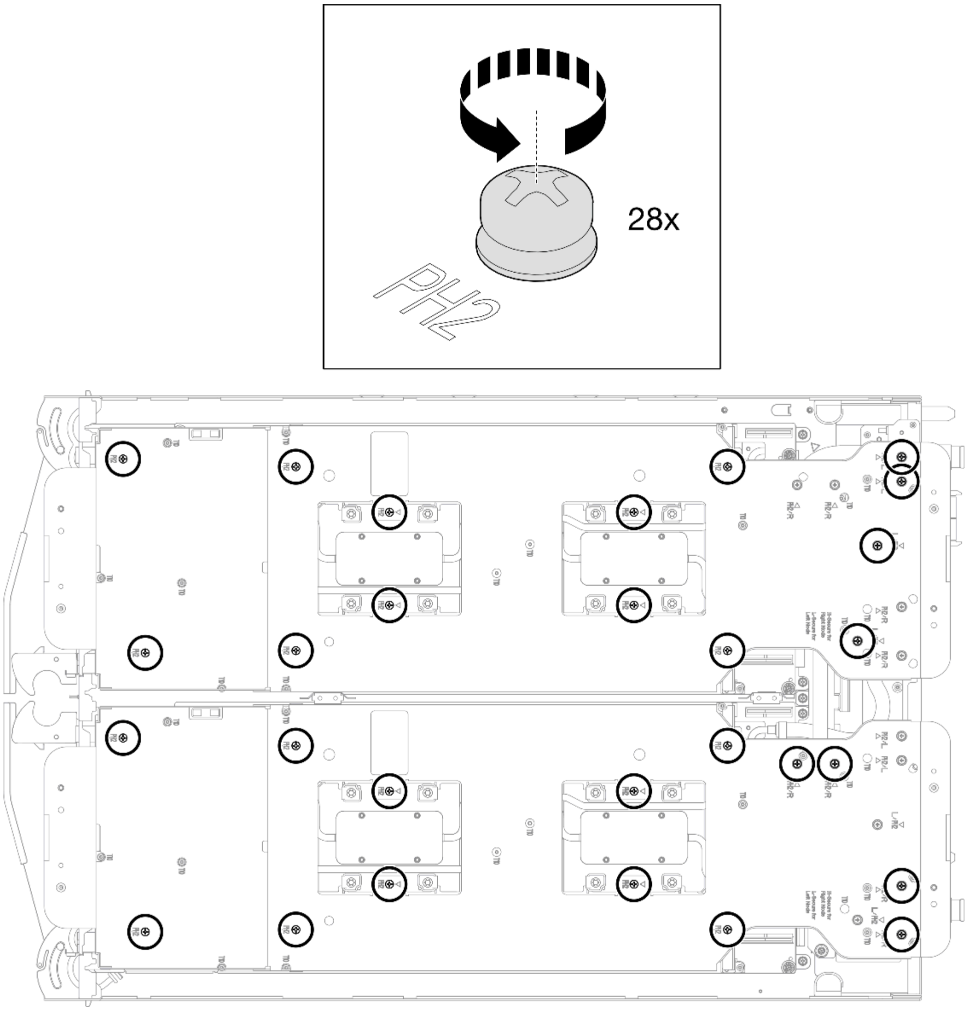


Figure 495. Loosening water loop carrier screws

Step 22. Carefully lift each water loop carrier up and away from the water loop one at a time.

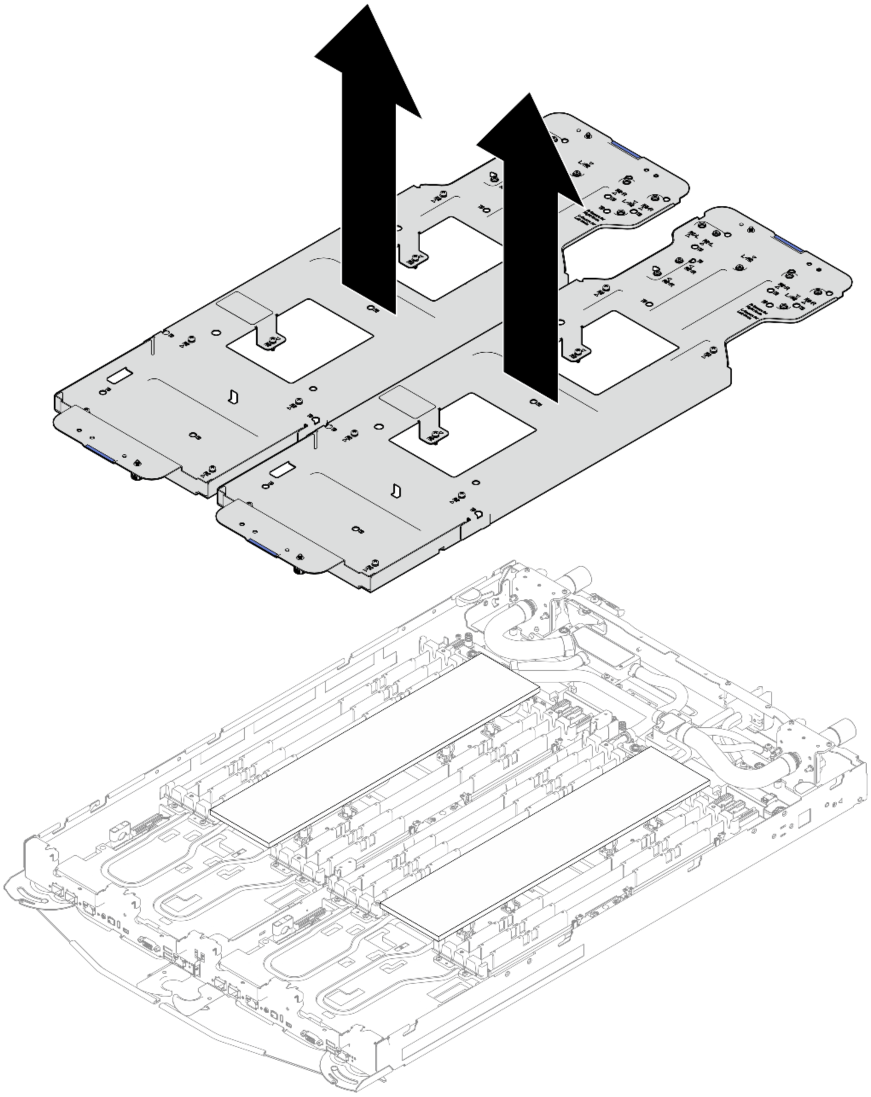


Figure 496. Water loop carrier removal

Step 23. Remove the foam protective packaging from the water loop.

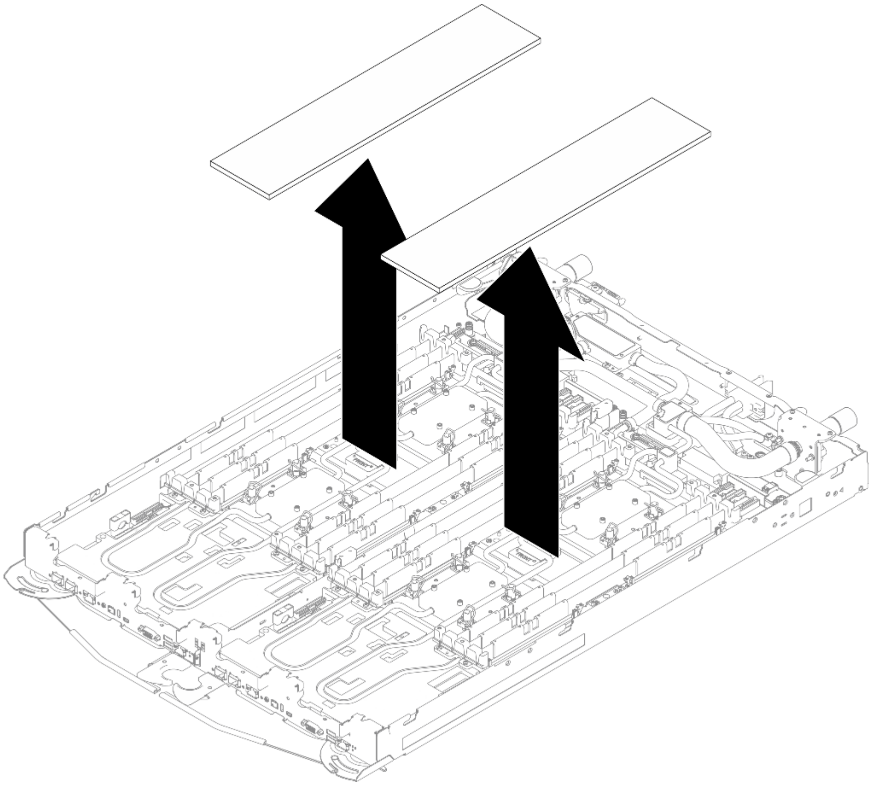


Figure 497. Removing foam packaging

Step 24. Fully tighten all Torx T30 captive screws (16x Torx T30 captive screws for two nodes) following the screw sequence label on the shipping bracket, with a torque screwdriver set to the proper torque.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 8+/- 0.5 lbf-in, 0.9+/- 0.05 N-m.
- To prevent damage to components, make sure that you follow the indicated tightening/loosening sequence.

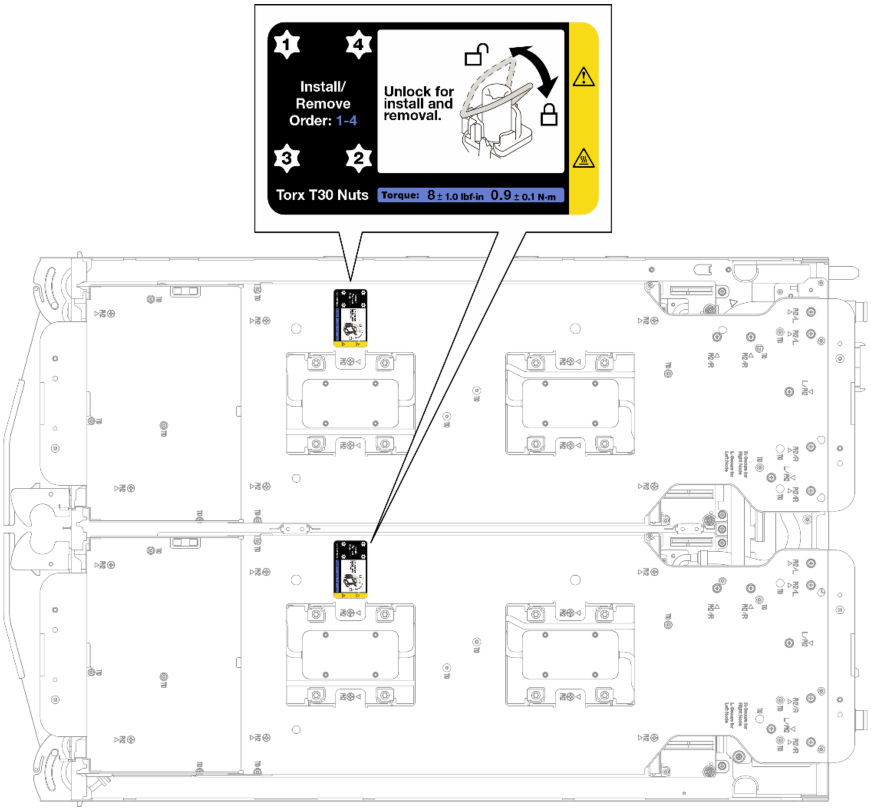


Figure 498. Screw tightening/loosening sequence on the shipping bracket label

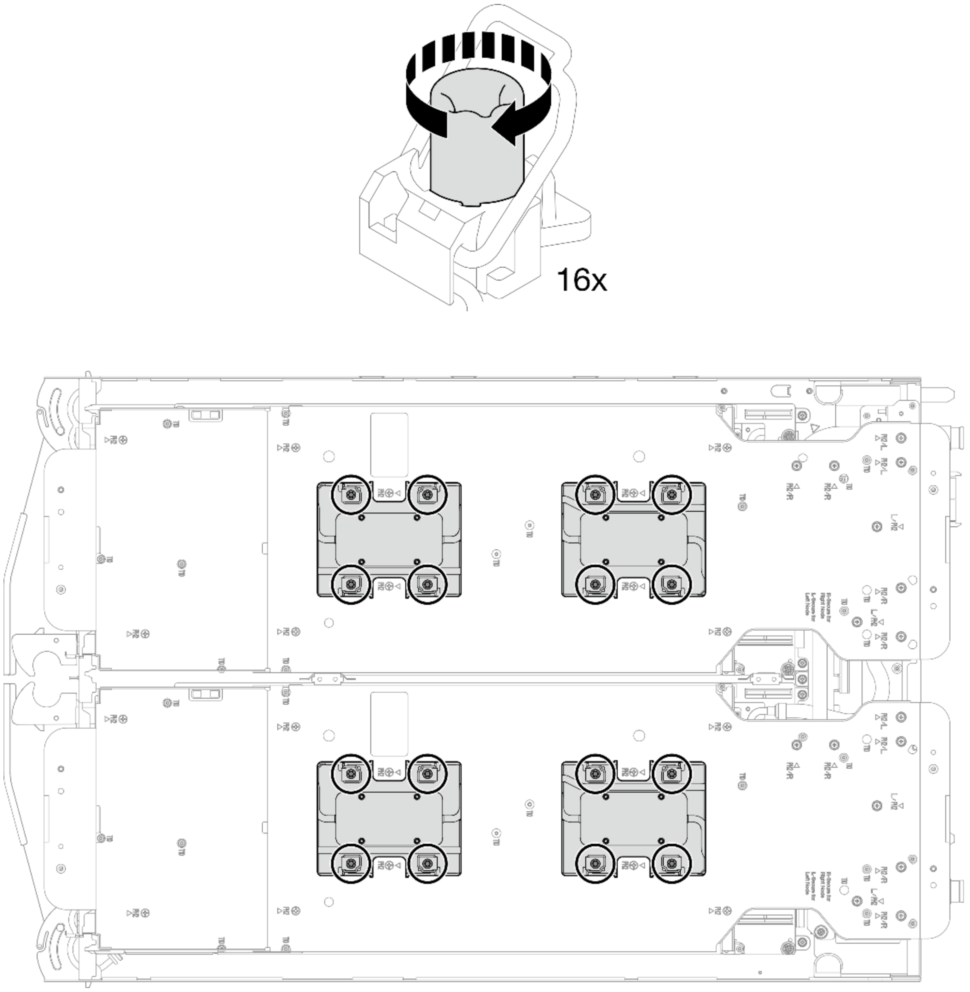


Figure 499. Tightening Torx T30 captive screws

Step 25. Install water loop screws (18x Torx T10 screws per node) with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

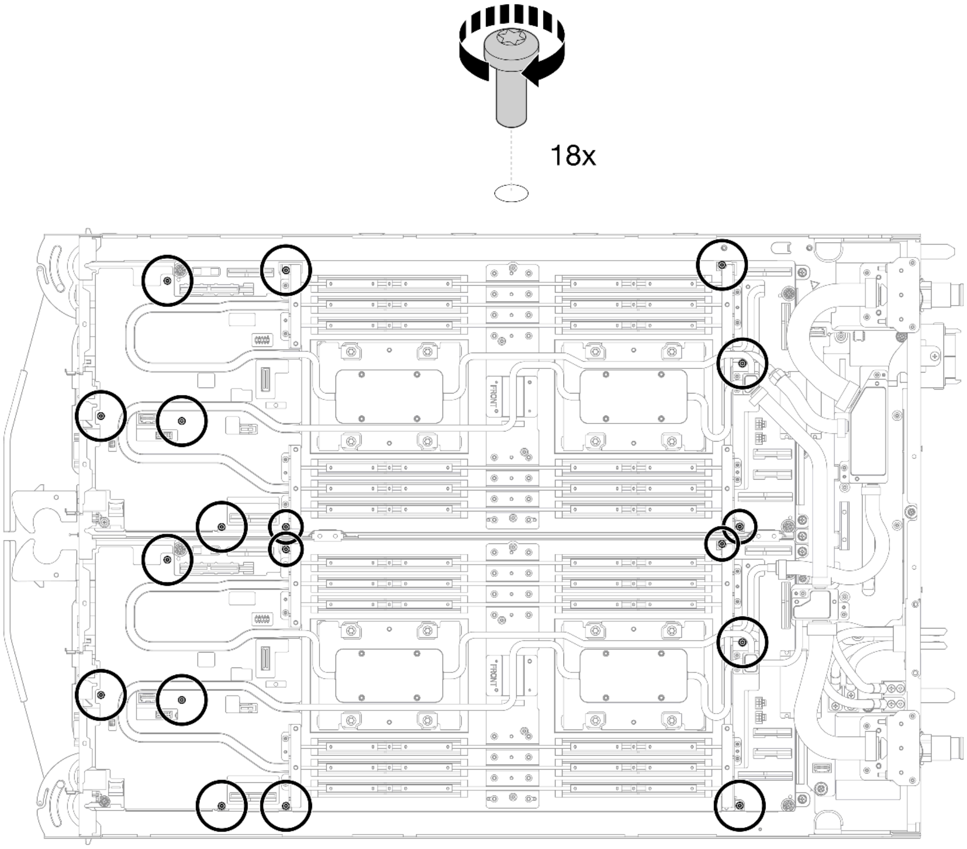


Figure 500. Water loop screws installation

Step 26. Install three Torx T10 screws to secure mixing chambers to the power distribution board cold plate with a torque screwdriver set to the proper torque.

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

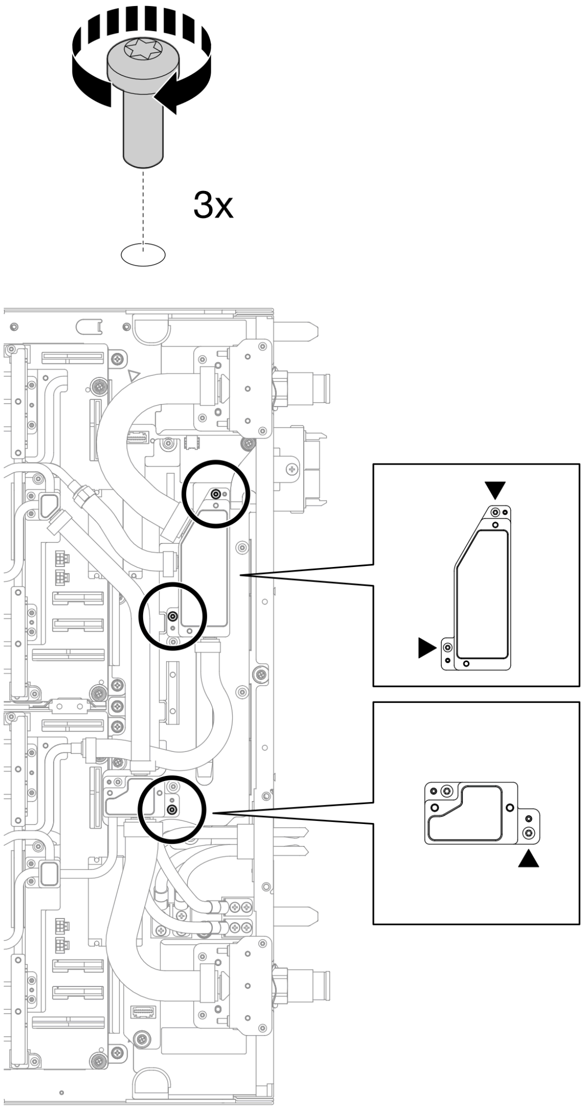


Figure 501. Mixing chamber screws installation

Step 27. Follow the screw installation sequence specified in the illustration, and install eight (8x) Torx T10 screws to secure the two quick connects to the tray (four screws for each quick connect).

Note: For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.

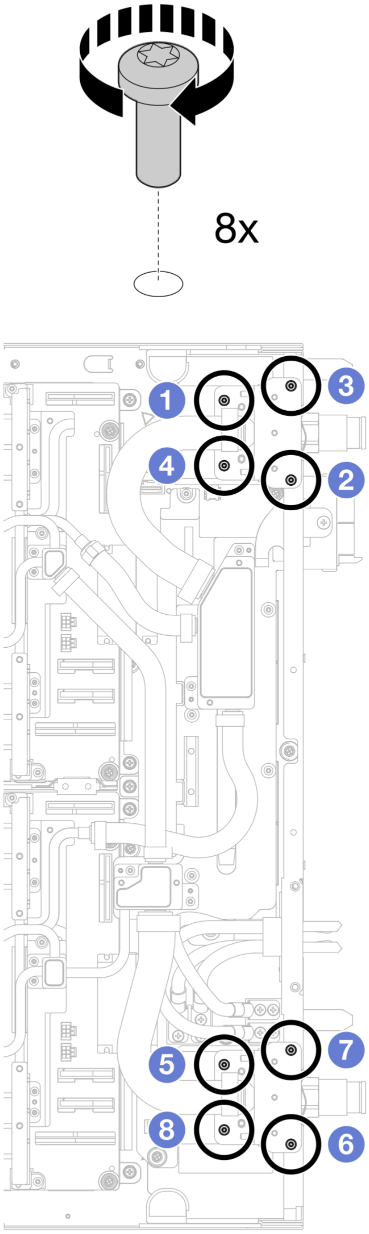


Figure 502. Quick connect screw installation

Step 28. Remove covers from the quick connects.

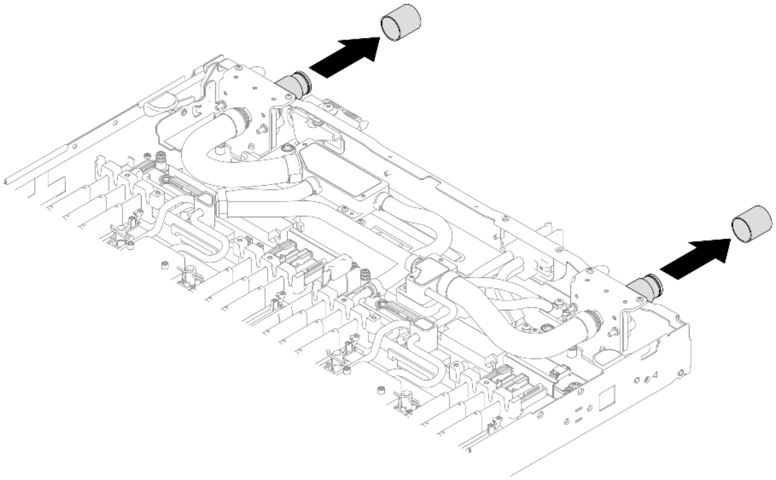


Figure 503. Removing quick connect covers

Step 29. Install two T10 screws to install the VR cover to the water loop. Make sure to install two VR covers to the water loop (one VR cover per node).

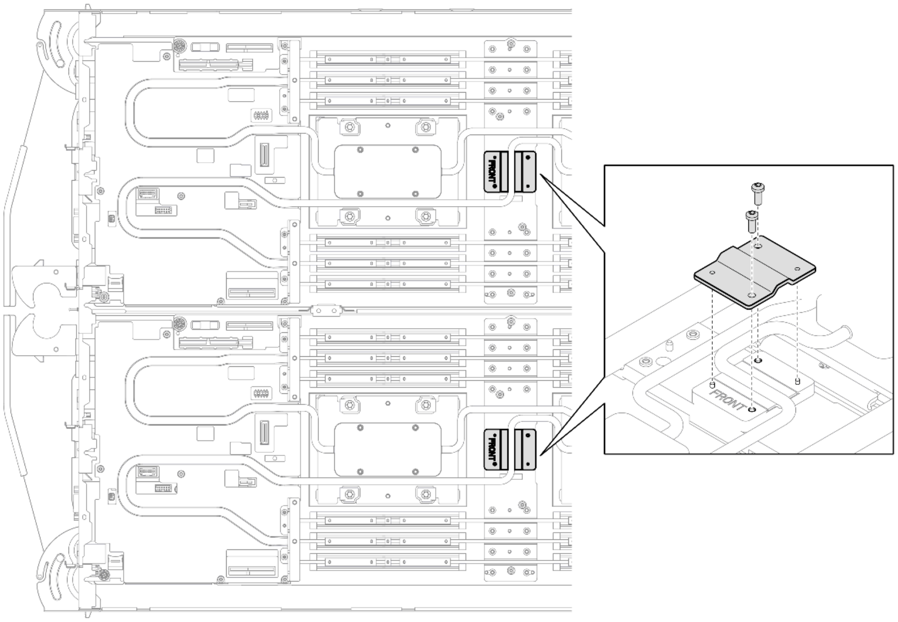


Figure 504. Installing the VR covers

Step 30. Check the gap pad on the top side of the E3.S middle cold plate, if it is damaged or detached, replace them with new one.

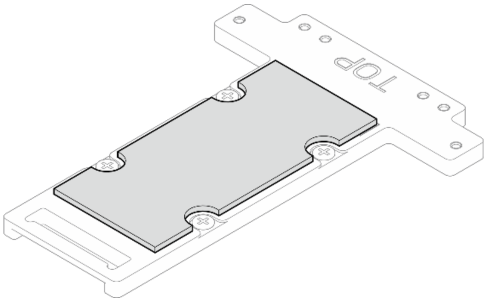


Figure 505. E3.S middle cold plate top side gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 31. Replace the single-use gap pad on bottom side of the E3.S middle cold plate a with new one.

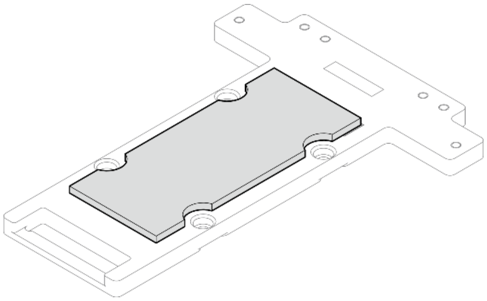


Figure 506. E3.S middle cold plate bottom side single-use gap pad location

Make sure to follow Gap pad replacement guidelines.

Step 32. Install four PH1 screws to install the middle drive cold plates to the water loop. **Make sure** to keep the “TOP” marking facing the rear of tray.

Notes:

- For reference, the torque required for the screws to be fully tightened/removed is 5.0+/- 0.5 lbf-in, 0.55+/- 0.05 N-M.
- Make sure to install all four middle drive cold plates to the water loop (two cold plates per node).

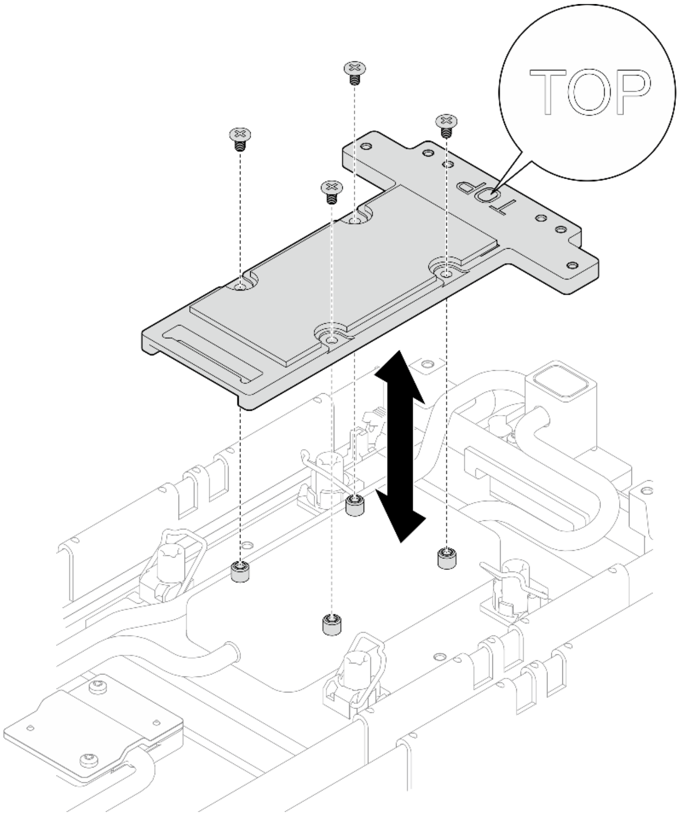


Figure 507. Install the middle drive cold plate

After you finish

1. Install the leakage sensor. See "Install the leakage sensor" on page 200.
2. Install the sideband cable kit. See "Install the system management sideband cable kit" on page 328.
3. Install the middle E3.S drive cage. See "Install an E3.S 1T middle drive cage assembly" on page 161.
4. Install the PCIe adapter riser cage. See "Install a ConnectX-7 NDR 200 adapter riser assembly" on page 77 or "Install a ConnectX-7 NDR 400 adapter riser assembly" on page 89.
5. Install the front E3.S drive cage. See "Install an E3.S front drive cage assembly" on page 124.
6. If the system will be installed with memory modules that requires dual-side cooling, install DIMM cooling bars. See "Install a DIMM cooling bar" on page 118.
7. Install the cross braces. See "Install the cross braces" on page 109.
8. Install the memory module, perform one of the following.
   - Install the memory modules that require single-side cooling. See "Install a memory module (single-side cooling) " on page 226., or
   - Install the memory modules that require dual-side cooling. See "Install a memory module (dual-side cooling) " on page 212.
9. Install the DIMM comb. See "Install a DIMM comb" on page 114.
10. Install the tray cover. See "Install the tray cover" on page 373.
11. Install the tray into the enclosure. See "Install a tray in the enclosure" on page 354.
12. Connect all required external cables to the solution.

    Note: Use extra force to connect QSFP cables to the solution.

13. Check the power LED on each node to make sure it changes from fast blink to slow blink to indicate all nodes are ready to be powered on.

    Note: Shared I/O configuration requires specific nodes power-on sequence. When powering on the system, power on **Node B** first; then, power on **Node A**. For more information, see “PCIe adapter cable routing” in *SC750 V4 Cable Routing Guide*.

Complete the parts replacement

Go through the checklist to complete parts replacement

To complete the parts replacement, do the following:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your solution.
2. Properly route and secure the cables in the solution. Refer to the cable connecting and routing information for each component.
3. If you have removed the tray cover, reinstall it. See “Install the tray cover” on page 373.
4. Install the tray into the enclosure. See “Install a tray in the enclosure” on page 354.
5. Reconnect external cables to the solution.

    Attention: To avoid component damage, connect the power cords last.
6. Power on the solution and any peripheral devices. See “Power on the solution” on page 48.
7. Update the solution configuration.
    - Download and install the latest device drivers: http://datacentersupport.lenovo.com.
    - Update the system firmware. See “Update the firmware” on page 427.
    - Update the UEFI configuration. See https://pubs.lenovo.com/uefi-overview/.
    - Reconfigure the disk arrays if you have installed or removed a hot-swap drive or a RAID adapter. See https://pubs.lenovo.com/lxpm-overview/ for the LXPM documentation compatible with your solution.

For *N1380 Enclosure User Guide*, see https://pubs.lenovo.com/n1380.

Chapter 6. System configuration

Complete these procedures to configure your system.

Set the network connection for the Lenovo XClarity Controller

Before you can access the Lenovo XClarity Controller over your network, you need to specify how Lenovo XClarity Controller will connect to the network. Depending on how the network connection is implemented, you might need to specify a static IP address as well.

The following methods are available to set the network connection for the Lenovo XClarity Controller if you are not using DHCP:

- If a monitor is attached to the server, you can use Lenovo XClarity Provisioning Manager to set the network connection.

  Complete the following steps to connect the Lenovo XClarity Controller to the network using the Lenovo XClarity Provisioning Manager.

  1. Start the server.
  2. Press the key specified in the on-screen instructions to display the Lenovo XClarity Provisioning Manager interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)
  3. Go to **LXPM → UEFI Setup → BMC Settings** to specify how the Lenovo XClarity Controller will connect to the network.
     - If you choose a static IP connection, make sure that you specify an IPv4 or IPv6 address that is available on the network.
     - If you choose a DHCP connection, make sure that the MAC address for the server has been configured in the DHCP server.
  4. Click **OK** to apply the setting and wait for two to three minutes.
  5. Use an IPv4 or IPv6 address to connect Lenovo XClarity Controller.

     Important: The Lenovo XClarity Controller is set initially with a user name of USERID and password of PASSW0RD (with a zero, not the letter O). This default user setting has Supervisor access. It is required to change this user name and password during your initial configuration for enhanced security.

- If no monitor is attached to the server, you can set the network connection through the System Management Module interface. Connect an Ethernet cable from your laptop to the Ethernet port on the System Management Module, which is located at the rear of the server.

  Note: Make sure that you modify the IP settings on the laptop so that it is on the same network as the server default settings.

  To access the System Management Module interface, the System Management Module network must be enabled. For more information about accessing the System Management Module, see: *System Management Module User's Guide* at https://pubs.lenovo.com/mgt_tools_smm3/.

  The default IPv4 address and the IPv6 Link Local Address (LLA) is provided on the Lenovo XClarity Controller Network Access label that is affixed to the Pull Out Information Tab. See "Identify the solution and access the Lenovo XClarity Controller" on page 27.

- If you are using the Lenovo XClarity Administrator Mobile app from a mobile device, you can connect to the Lenovo XClarity Controller through the Lenovo XClarity Controller USB connector or USB 3.0 Console

Breakout Cable. For location of Lenovo XClarity Controller USB connector and USB 3.0 Console Breakout Cable connector, see server front view.

To connect using the Lenovo XClarity Administrator Mobile app:

1. If applicable, connect the USB 3.0 Console Breakout Cable to the front panel.
2. Connect the USB cable of your mobile device to the Lenovo XClarity Controller USB connector or USB 3.0 Console Breakout Cable.
3. On your mobile device, enable USB tethering.
4. On your mobile device, launch the Lenovo XClarity Administrator mobile app.
5. If automatic discovery is disabled, click **Discovery** on the USB Discovery page to connect to the Lenovo XClarity Controller.

For more information about using the Lenovo XClarity Administrator Mobile app, see:

https://pubs.lenovo.com/lxca/lxca_usemobileapp

Set USB port for Lenovo XClarity Controller connection

Before you can access the Lenovo XClarity Controller through the USB port, you need to configure the USB port for Lenovo XClarity Controller connection.

Server support

To see if your server supports accessing Lenovo XClarity Controller through the USB port, check one of the following:

- Refer to Chapter 2 "Server components" on page 15.
- 🔧 If there is a wrench icon on the USB port of your server, you can set the management USB port to connect to Lenovo XClarity Controller. It is also the only USB port that supports USB automation update of the system I/O board (or firmware and RoT security module).

Setting the USB port for Lenovo XClarity Controller connection

You can switch the USB port between normal and Lenovo XClarity Controller management operation by performing one of the following steps.

- Hold the ID button for at least 3 seconds until its LED flashes slowly (once every couple of seconds). See Chapter 2 "Server components" on page 15 for ID button location.
- From the Lenovo XClarity Controller management controller CLI, run the `usbfp` command. For information about using the Lenovo XClarity Controller CLI, see the "Command-line interface" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.
- From the Lenovo XClarity Controller management controller web interface, click **BMC Configuration → Network → USB Management Port Assignment**. For information about Lenovo XClarity Controller web interface functions, see the "Description of XClarity Controller functions on web interface" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

Checking USB port current setting

You can also check the current setting of the USB port using the Lenovo XClarity Controller management controller CLI (`usbfp` command) or the Lenovo XClarity Controller management controller web interface (**BMC Configuration → Network → USB Management Port Assignment**). See the "Command-line interface” and “Description of XClarity Controller functions on web interface” sections in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

Update the firmware

Several options are available to update the firmware for the server.

You can use the tools listed here to update the most current firmware for your server and the devices that are installed in the server.

Notes: It is recommended to update the firmware in the following sequence:
- BMC (XCC)
- FPGA HPM
- FPGA SCM
- UEFI

- Best practices related to updating firmware is available at the following site:
  - https://lenovopress.lenovo.com/lp0656-lenovo-thinksystem-firmware-and-driver-update-best-practices
- The latest firmware can be found at the following site:
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/
- You can subscribe to product notification to stay up to date on firmware updates:
  - https://datacentersupport.lenovo.com/solutions/ht509500

Update Bundles (Service Packs)

Lenovo typically releases firmware in bundles called Update Bundles (Service Packs). To ensure that all of the firmware updates are compatible, you should update all firmware at the same time. If you are updating firmware for both the Lenovo XClarity Controller and UEFI, update the firmware for Lenovo XClarity Controller first.

Update method terminology

- **In-band update**. The installation or update is performed using a tool or application within an operating system that is executing on the server’s core CPU.
- **Out-of-band update**. The installation or update is performed by the Lenovo XClarity Controller collecting the update and then directing the update to the target subsystem or device. Out-of-band updates have no dependency on an operating system executing on the core CPU. However, most out-of-band operations do require the server to be in the S0 (Working) power state.
- **On-Target update.** The installation or update is initiated from an installed operating system executing on the target server itself.
- **Off-Target update.** The installation or update is initiated from a computing device interacting directly with the server’s Lenovo XClarity Controller.
- **Update Bundles (Service Packs)**. Update Bundles (Service Packs) are bundled updates designed and tested to provide the interdependent level of functionality, performance, and compatibility. Update Bundles (Service Packs) are server machine-type specific and are built (with firmware and device driver updates) to support specific Windows Server, Red Hat Enterprise Linux (RHEL) and SUSE Linux Enterprise Server (SLES) operating system distributions. Machine-type-specific firmware-only Update Bundles (Service Packs) are also available.

Firmware updating tools

See the following table to determine the best Lenovo tool to use for installing and setting up the firmware:

Tool	Update Methods Suppor-ted	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Provisioning Manager (LXPM)	In-band[2] On-Target	√			√		
Lenovo XClarity Controller (XCC)	In-band[4] Out-of-band Off-Target	√	Selected I/O devices	√[3]	√		√
Lenovo XClarity Essentials OneCLI (OneCLI)	In-band Out-of-band On-Target Off-Target	√	All I/O devices	√[3]		√	√
Lenovo XClarity Essentials UpdateXpress (LXCE)	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√
Lenovo XClarity Essentials Bootable Media Creator (BoMC)	In-band Out-of-band Off-Target	√	All I/O devices		√ (BoMC application)	√ (BoMC application)	√
Lenovo XClarity Administrator (LXCA)	In-band[1] Out-of-band[2] Off-Target	√	All I/O devices	√	√		√
Lenovo XClarity Integrator (LXCI) for VMware vCenter	Out-of-band Off-Target	√	Selected I/O devices		√		

Tool	Update Methods Supported	Core System Firmware Updates	I/O Devices Firmware Updates	Drive Firmware Updates	Graphical user interface	Command line interface	Supports Update Bundles (Service Packs)
Lenovo XClarity Integrator (LXCI) for Microsoft Windows Admin Center	In-band Out-of-band On-Target Off-Target	√	All I/O devices		√		√

Notes:

1. For I/O firmware updates.
2. For BMC and UEFI firmware updates.
3. Drive firmware update is only supported by the tools and methods below:
   - XCC Bare Metal Update (BMU): In-band, and requires system reboot.
   - Lenovo XClarity Essentials OneCLI: In-band, and does not require system reboot.
4. Bare Metal Update (BMU) only.

- **Lenovo XClarity Provisioning Manager**

  From Lenovo XClarity Provisioning Manager, you can update the Lenovo XClarity Controller firmware, the UEFI firmware, and the Lenovo XClarity Provisioning Manager software.

  Note: By default, the Lenovo XClarity Provisioning Manager Graphical User Interface is displayed when you start the server and press the key specified in the on-screen instructions. If you have changed that default to be the text-based system setup, you can bring up the Graphical User Interface from the text-based system setup interface.

  For additional information about using Lenovo XClarity Provisioning Manager to update firmware, see:

  “Firmware Update” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/

- **Lenovo XClarity Controller**

  If you need to install a specific update, you can use the Lenovo XClarity Controller interface for a specific server.

  Notes:

  – To perform an in-band update through Windows or Linux, the operating system driver must be installed and the Ethernet-over-USB (sometimes called LAN over USB) interface must be enabled.

    For additional information about configuring Ethernet over USB, see:

    “Configuring Ethernet over USB” section in the XCC documentation version compatible with your server at https://pubs.lenovo.com/lxcc-overview/

  – If you update firmware through the Lenovo XClarity Controller, make sure that you have downloaded and installed the latest device drivers for the operating system that is running on the server.

  For additional information about using Lenovo XClarity Controller to update firmware, see:

  “Updating Server Firmware” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

- **Lenovo XClarity Essentials OneCLI**

  Lenovo XClarity Essentials OneCLI is a collection of command line applications that can be used to manage Lenovo servers. Its update application can be used to update firmware and device drivers for your servers. The update can be performed within the host operating system of the server (in-band) or remotely through the BMC of the server (out-of-band).

  For additional information about using Lenovo XClarity Essentials OneCLI to update firmware, see:

  https://pubs.lenovo.com/lxce-onecli/onecli_c_update

- **Lenovo XClarity Essentials UpdateXpress**

  Lenovo XClarity Essentials UpdateXpress provides most of OneCLI update functions through a graphical user interface (GUI). It can be used to acquire and deploy Update Bundles (Service Packs) update packages and individual updates. Update Bundles (Service Packs) contain firmware and device driver updates for Microsoft Windows and for Linux.

  You can obtain Lenovo XClarity Essentials UpdateXpress from the following location:

  https://datacentersupport.lenovo.com/solutions/lnvo-xpress

- **Lenovo XClarity Essentials Bootable Media Creator**

  You can use Lenovo XClarity Essentials Bootable Media Creator to create bootable media that is suitable for firmware updates, VPD updates, inventory and FFDC collection, advanced system configuration, FoD Keys management, secure erase, RAID configuration, and diagnostics on supported servers.

  You can obtain Lenovo XClarity Essentials BoMC from the following location:

  https://datacentersupport.lenovo.com/solutions/lnvo-bomc

- **Lenovo XClarity Administrator**

  If you are managing multiple servers using the Lenovo XClarity Administrator, you can update firmware for all managed servers through that interface. Firmware management is simplified by assigning firmware-compliance policies to managed endpoints. When you create and assign a compliance policy to managed endpoints, Lenovo XClarity Administrator monitors changes to the inventory for those endpoints and flags any endpoints that are out of compliance.

  For additional information about using Lenovo XClarity Administrator to update firmware, see:

  https://pubs.lenovo.com/lxca/update_fw

- **Lenovo XClarity Integrator offerings**

  Lenovo XClarity Integrator offerings can integrate management features of Lenovo XClarity Administrator and your server with software used in a certain deployment infrastructure, such as VMware vCenter, Microsoft Admin Center, or Microsoft System Center.

  For additional information about using Lenovo XClarity Integrator to update firmware, see:

  https://pubs.lenovo.com/lxci-overview/

Configure the firmware

Several options are available to install and set up the firmware for the server.

Note: UEFI **Legacy Mode** is not supported by ThinkSystem V4 products.

- **Lenovo XClarity Provisioning Manager (LXPM)**

  From Lenovo XClarity Provisioning Manager, you can configure the UEFI settings for your server.

Notes: The Lenovo XClarity Provisioning Manager provides a Graphical User Interface to configure a server. The text-based interface to system configuration (the Setup Utility) is also available. From Lenovo XClarity Provisioning Manager, you can choose to restart the server and access the text-based interface. In addition, you can choose to make the text-based interface the default interface that is displayed when you start LXPM. To do this, go to **Lenovo XClarity Provisioning Manager → UEFI Setup → System Settings → <F1>Start Control → Text Setup**. To start the server with Graphic User Interface, select **Auto** or **Tool Suite**.

See the following documentations for more information:

- Search for the LXPM documentation version compatible with your server at https://pubs.lenovo.com/lxpm-overview/
- *UEFI User Guide* at https://pubs.lenovo.com/uefi-overview/

- **Lenovo XClarity Essentials OneCLI**

  You can use the config application and commands to view the current system configuration settings and make changes to Lenovo XClarity Controller and UEFI. The saved configuration information can be used to replicate or restore other systems.

  For information about configuring the server using Lenovo XClarity Essentials OneCLI, see:

  https://pubs.lenovo.com/lxce-onecli/onecli_c_settings_info_commands

- **Lenovo XClarity Administrator**

  You can quickly provision and pre-provision all of your servers using a consistent configuration. Configuration settings (such as local storage, I/O adapters, boot settings, firmware, ports, and Lenovo XClarity Controller and UEFI settings) are saved as a server pattern that can be applied to one or more managed servers. When the server patterns are updated, the changes are automatically deployed to the applied servers.

  Specific details about configuring the server using Lenovo XClarity Administrator are available at:

  https://pubs.lenovo.com/lxca/server_configuring

- **Lenovo XClarity Controller**

  You can configure the management processor for the server through the Lenovo XClarity Controller Web interface, the command-line interface, or Redfish API.

  For information about configuring the server using Lenovo XClarity Controller, see:

  "Configuring the Server" section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

Memory module configuration

Memory performance depends on several variables, such as memory mode, memory speed, memory ranks, memory population and processor.

Information about optimizing memory performance and configuring memory is available at the Lenovo Press website:

https://lenovopress.lenovo.com/servers/options/memory

In addition, you can take advantage of a memory configurator, which is available at the following site:

https://dcsc.lenovo.com/#/memory_configuration

Enable Software Guard Extensions (SGX)

Intel® Software Guard Extensions (Intel® SGX) operates under the assumption that the security perimeter includes only the internals of the CPU package, and leaves the DRAM untrusted.

Complete the following steps to enable SGX.

Step 1. **Make sure** to refer to "Memory module installation rules and order" on page 36, which specifies whether your server supports SGX and lists the memory module population sequence for SGX configuration. (DIMM configuration must be at least 8 DIMMs per socket to support SGX.)

Step 2. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)

Step 3. Go to **System settings → Processors → Total Memory Encryption (TME)** and enable the option.

Step 4. Save the changes, then go to **System settings → Processors → SW Guard Extension (SGX)** and enable the option.

RAID configuration

Using a Redundant Array of Independent Disks (RAID) to store data remains one of the most common and cost-efficient methods to increase server's storage performance, availability, and capacity.

RAID increases performance by allowing multiple drives to process I/O requests simultaneously. RAID can also prevent data loss in case of a drive failure by reconstructing (or rebuilding) the missing data from the failed drive using the data from the remaining drives.

RAID array (also known as RAID drive group) is a group of multiple physical drives that uses a certain common method to distribute data across the drives. A virtual drive (also known as virtual disk or logical drive) is a partition in the drive group that is made up of contiguous data segments on the drives. Virtual drive is presented up to the host operating system as a physical disk that can be partitioned to create OS logical drives or volumes.

An introduction to RAID is available at the following Lenovo Press website:

https://lenovopress.lenovo.com/lp0578-lenovo-raid-introduction

Detailed information about RAID management tools and resources is available at the following Lenovo Press website:

https://lenovopress.lenovo.com/lp0579-lenovo-raid-management-tools-and-resources

Intel VROC

Enabling Intel VROC

Before setting up RAID for NVMe drives, follow the below steps to enable VROC:

1. Restart the system. Before the operating system starts up, press the key specified in the on-screen instructions to enter the Setup Utility. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.)
2. Go to **System settings → Devices and I/O Ports → Intel® VMD technology → Enable/Disable Intel® VMD** and enable the option.
3. Save the changes and reboot the system.

Intel VROC configurations

Intel offers various VROC configurations with different RAID level and SSD support. See the following for more details.

Notes:

- Supported RAID levels varies by model. For the RAID level supported by SC750 V4, see Technical specifications.
- For more information about acquiring and installing the activation key, see https://fod.lenovo.com/lkms.

Intel VROC configurations for PCIe NVMe SSDs	**Requirements**
Intel VROC Standard	• Supports RAID levels 0, 1, and 10 • Requires an activation key
Intel VROC Premium	• Supports RAID levels 0, 1, 5, and 10 • Requires an activation key
Bootable RAID	• RAID 1 only • Requires an activation key • Supported processors: – 5th Gen Intel® Xeon® Scalable processors (formerly codenamed as Emerald Rapids, EMR) – 6th Gen Intel® Xeon® Scalable processors with P-cores (formerly codenamed as Granite Rapids-SP, GNR-SP) – 6th Gen Intel® Xeon® Scalable processors with E-cores (formerly codenamed as Sierra Forest-SP, SRF-SP)
Intel VROC configurations for SATA SSDs	**Requirements**
Intel VROC SATA RAID	• Supports RAID levels 0, 1, 5, and 10. • Not supported by Granite Rapids-SP (GNR-SP) processors and Sierra Forest-SP (SRF-SP) processors.

PCS configuration

Refer to the following section for more information on the PCS configurations.

SC750 V4 PCS configuration

Validate the power requirements for your configuration using the latest version of the Power Configurator to ensure that the number of Power Conversion Stations selected are adequate for supporting your chassis configuration. The Power Configurator tool can be found at https://datacentersupport.lenovo.com/solutions/lnvo-lcp.

CAUTION:
Failure to validate the configuration with the Power Configurator tool could result in system errors, failure to power on, or microprocessor throttling, and limiting system's ability to leverage all the microprocessor performance.

PCS support matrix

Note: The tables below are based on nodes with all DIMM slots, PCIe slots, and storage drives populated.

Component	SC750 V4 support configurations
15000W Titanium DWC PCS	4 DWC PCS
High power interposer card	Supported
SMM3	Supported

Power policy

Component	SC750 V4 power policy
15000W Titanium DWC PCS	Supports up to four 15000W Power Conversion Stations (PCS): • The enclosure must be installed with at least three PCS. • Input voltage: 380 – 480 Vac (Acbel DWC PCS) • Redundancy: work as N+1 with OVS and N+N with OVS (OVS: oversubscription) • Resetting SMM3 to factory defaults will cause the PCS redundancy mode to return to the default N+1 mode. If needed, re-configure PCS redundancy mode as the original or as loading required via SMM3. **Note:** Oversubscription (OVS) of the power system allows for more efficient use of the available system power.

Deploy the operating system

Several options are available to deploy an operating system on the server.

Available operating systems

- Ubuntu Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

Complete list of available operating systems: https://lenovopress.lenovo.com/osig.

Tool-based deployment

- **Multi-server**

  Available tools:

  - Lenovo XClarity Administrator

    https://pubs.lenovo.com/lxca/compute_node_image_deployment

- **Single-server**

  Available tools:

  - Lenovo XClarity Provisioning Manager

    “OS Installation” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/

Manual deployment

If you cannot access the above tools, follow the instructions below, download the corresponding *OS Installation Guide*, and deploy the operating system manually by referring to the guide.

1. Go to https://datacentersupport.lenovo.com/solutions/server-os.
2. Select an operating system from the navigation pane and click **Resources**.
3. Locate the “OS Install Guides” area and click the installation instructions. Then, follow the instructions to complete the operation system deployment task.

Back up the server configuration

After setting up the server or making changes to the configuration, it is a good practice to make a complete backup of the server configuration.

Make sure that you create backups for the following server components:

- **Management processor**

  You can back up the management processor configuration through the Lenovo XClarity Controller interface. For details about backing up the management processor configuration, see:

  “Backing up the BMC configuration” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

  Alternatively, you can use the `backup` command from Lenovo XClarity Essentials OneCLI to create a backup of all configuration settings. For more information about the `backup` command, see:

  https://pubs.lenovo.com/lxce-onecli/config_backup

- **Operating system**

  Use your backup methods to back up the operating system and user data for the server.

Chapter 7. Problem determination

Use the information in this section to isolate and resolve issues that you might encounter while using your server.

Lenovo servers can be configured to automatically notify Lenovo Support if certain events are generated. You can configure automatic notification, also known as Call Home, from management applications, such as the Lenovo XClarity Administrator. If you configure automatic problem notification, Lenovo Support is automatically alerted whenever a server encounters a potentially significant event.

To isolate a problem, you should typically begin with the event log of the application that is managing the server:

- If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
- If you are using some other management application, begin with the Lenovo XClarity Controller event log.

Web resources

- **Tech tips**

  Lenovo continually updates the support website with the latest tips and techniques that you can use to solve issues that your server might encounter. These Tech Tips (also called retain tips or service bulletins) provide procedures to work around issues or solve problems related to the operation of your server.

  To find the Tech Tips available for your server:

  1. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server.
  2. Click on **How To's** from the navigation pane.
  3. Click **Article Type** → **Solution** from the drop-down menu.

     Follow the on-screen instructions to choose the category for the problem that you are having.

- **Lenovo Data Center Forum**
  - Check https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

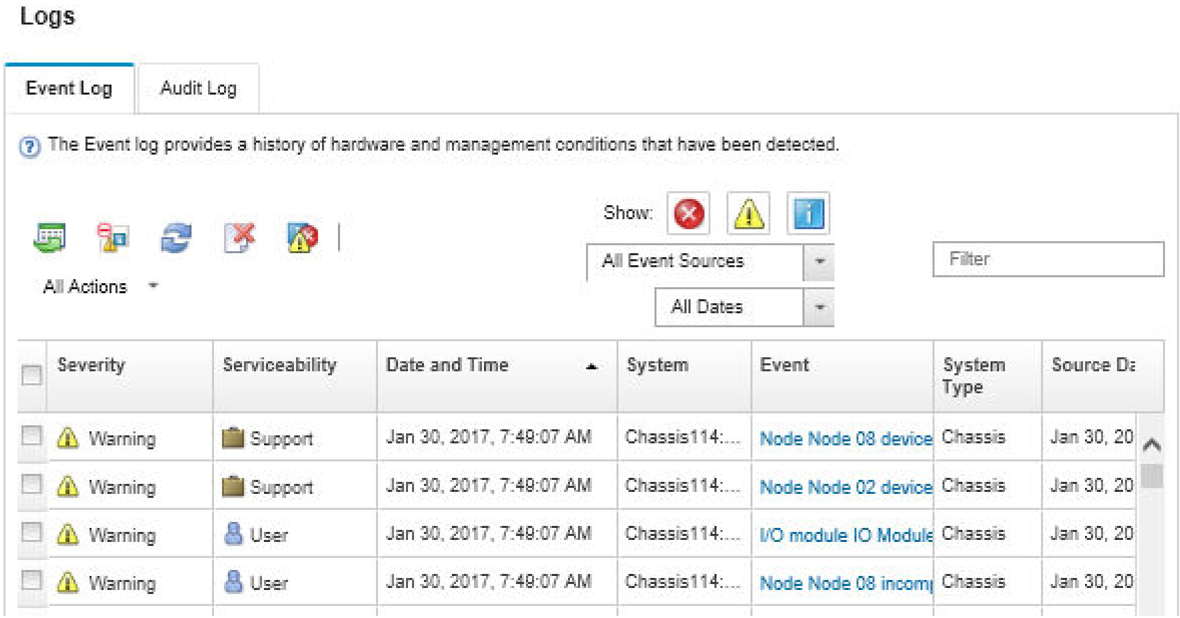
Event logs

An *alert* is a message or other indication that signals an event or an impending event. Alerts are generated by the Lenovo XClarity Controller or by UEFI in the servers. These alerts are stored in the Lenovo XClarity Controller Event Log. If the server is managed by the Chassis Management Module 2 or by the Lenovo XClarity Administrator, alerts are automatically forwarded to those management applications.

Note: For a listing of events, including user actions that might need to be performed to recover from an event, see the *Messages and Codes Reference*, which is available at https://pub.lenovo.com/sc750-v4/pdf_files.

Lenovo XClarity Administrator event log

If you are using Lenovo XClarity Administrator to manage server, network, and storage hardware, you can view the events from all managed devices through the XClarity Administrator.



The Event log provides a history of hardware and management conditions that have been detected.

☐	Severity	Serviceability	Date and Time	System	Event	System Type	Source Da
☐	Warning	Support	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 08 device	Chassis	Jan 30, 20
☐	Warning	Support	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 02 device	Chassis	Jan 30, 20
☐	Warning	User	Jan 30, 2017, 7:49:07 AM	Chassis114:...	I/O module IO Module	Chassis	Jan 30, 20
☐	Warning	User	Jan 30, 2017, 7:49:07 AM	Chassis114:...	Node Node 08 incom	Chassis	Jan 30, 20

Figure 508. Lenovo XClarity Administrator event log

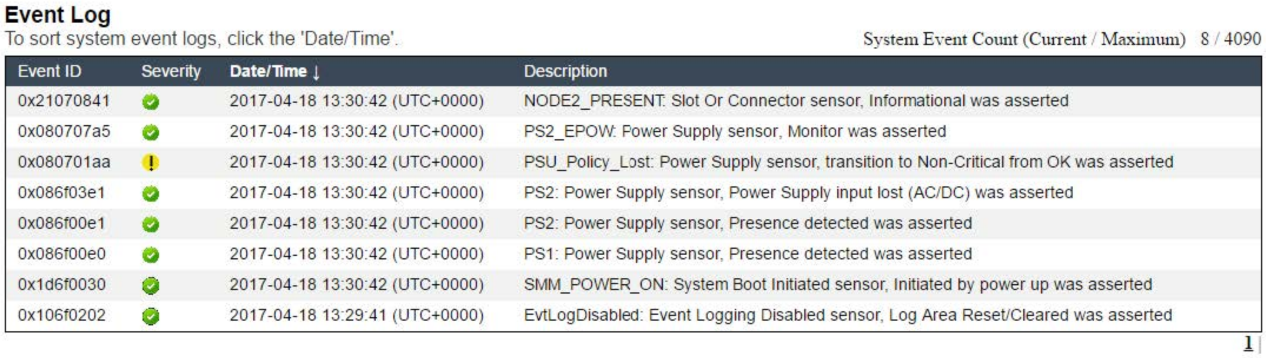
For more information about working with events from XClarity Administrator, see:

https://pubs.lenovo.com/lxca/events_vieweventlog

System Management Module 3 event log

The SMM3 event log contains all events received from all nodes in the enclosure. In addition, it includes events related to power and cooling.

Note: New SMM3 events are appended to the end of the event log. The log can store up to 4, 090 events; you must clear the log to add additional events.



Event Log

To sort system event logs, click the 'Date/Time'.

System Event Count (Current / Maximum) 8 / 4090

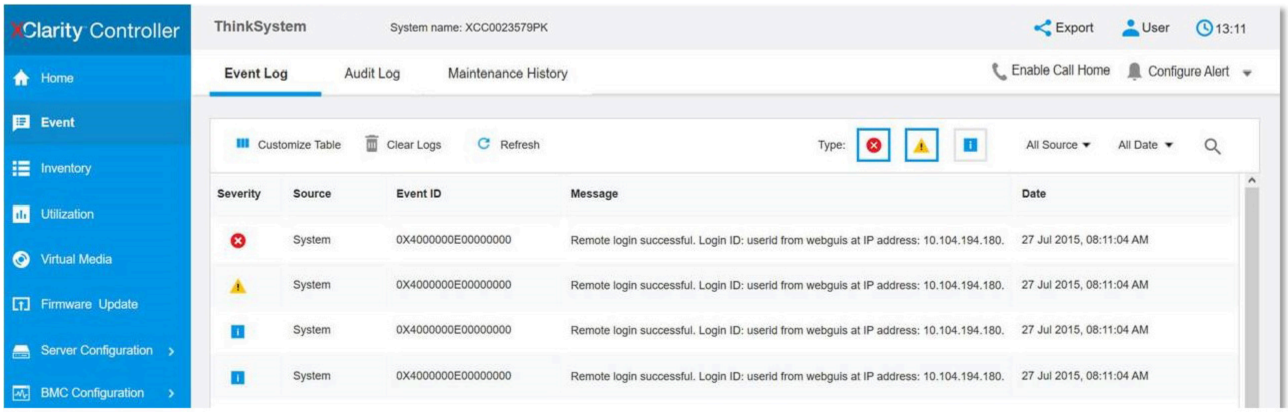
Event ID	Severity	Date/Time ↓	Description
0x21070841	✓	2017-04-18 13:30:42 (UTC+0000)	NODE2_PRESENT: Slot Or Connector sensor, Informational was asserted
0x080707a5	✓	2017-04-18 13:30:42 (UTC+0000)	PS2_EPOW: Power Supply sensor, Monitor was asserted
0x080701aa	!	2017-04-18 13:30:42 (UTC+0000)	PSU_Policy_Lost: Power Supply sensor, transition to Non-Critical from OK was asserted
0x086f03e1	✓	2017-04-18 13:30:42 (UTC+0000)	PS2: Power Supply sensor, Power Supply input lost (AC/DC) was asserted
0x086f00e1	✓	2017-04-18 13:30:42 (UTC+0000)	PS2: Power Supply sensor, Presence detected was asserted
0x086f00e0	✓	2017-04-18 13:30:42 (UTC+0000)	PS1: Power Supply sensor, Presence detected was asserted
0x1d6f0030	✓	2017-04-18 13:30:42 (UTC+0000)	SMM_POWER_ON: System Boot Initiated sensor, Initiated by power up was asserted
0x106f0202	✓	2017-04-18 13:29:41 (UTC+0000)	EvtLogDisabled: Event Logging Disabled sensor, Log Area Reset/Cleared was asserted

Figure 509. SMM3 event log

Lenovo XClarity Controller event log

The Lenovo XClarity Controller monitors the physical state of the server and its components using sensors that measure internal physical variables such as temperature, power-supply voltages, fan speeds, and component status. The Lenovo XClarity Controller provides various interfaces to systems management software and to system administrators and users to enable remote management and control of a server.

The Lenovo XClarity Controller monitors all components of the server and posts events in the Lenovo XClarity Controller event log.



Severity	Source	Event ID	Message	Date
⊗	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
⚠	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
ℹ	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM
ℹ	System	0X4000000E00000000	Remote login successful. Login ID: userid from webguis at IP address: 10.104.194.180.	27 Jul 2015, 08:11:04 AM

Figure 510. Lenovo XClarity Controller event log

For more information about accessing the Lenovo XClarity Controller event log, see:

“Viewing Event Logs” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/

Troubleshooting by system LEDs and diagnostics display

See the following section for information on available system LEDs and diagnostics display.

Front LEDs

The following illustration shows LEDs on the front of the solution. By viewing the status of LEDs, you can often identify the source of the error.

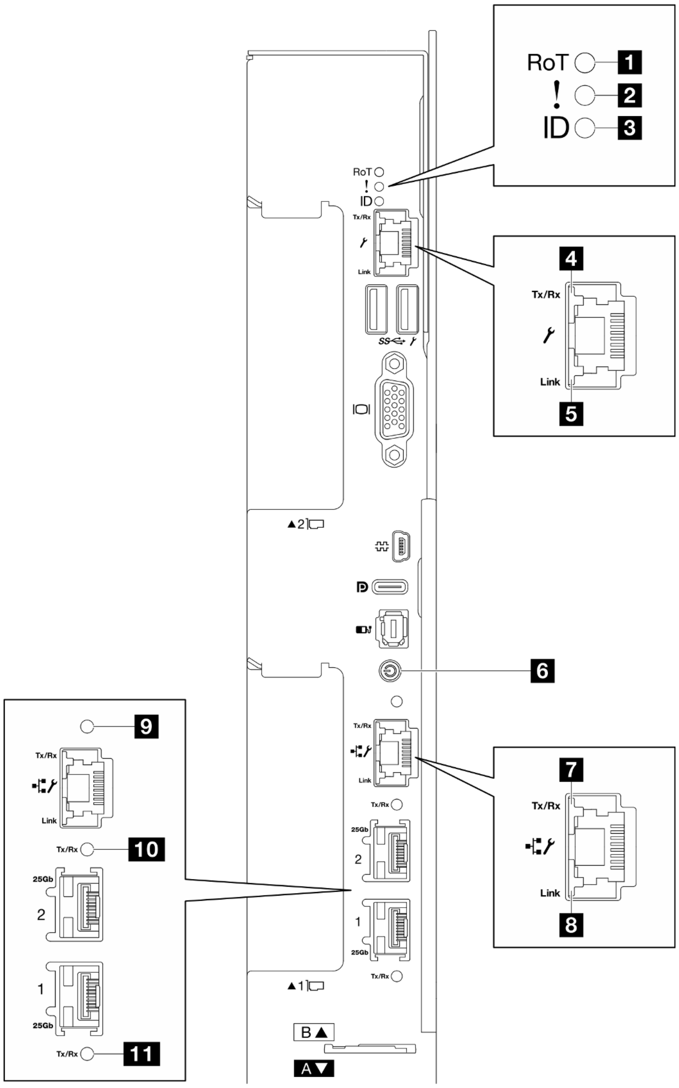


Figure 511. SC750 V4 tray front LEDs

Table 27. Front LEDs

1 RoT LED	7 1 Gb RJ45 Ethernet port (share-NIC) activity LED (green)
2 System error LED (yellow)	8 1 Gb RJ45 Ethernet port (share-NIC) link LED (green)
3 Identification LED (blue)	9 Drive activity LED (green)
4 Dedicated XCC management connector (1 Gb RJ45) activity LED (green)	10 25 Gb Ethernet port link and activity LED (port 2) (green)
5 Dedicated XCC management connector (1 Gb RJ45) link LED (green)	11 25 Gb Ethernet port link and activity LED (port 1) (green)
6 Node power button with LED (green)	

1 RoT LED:(TBD)

2 System error LED (yellow): When this yellow LED is lit, it indicates that a system error has occurred. Check the XCC event log for additional information.

3 Identification LED (blue): Use this blue LED to visually locate the node among other nodes. This LED is also used as a presence detection button. You can use Lenovo XClarity Administrator to light this LED remotely.

4 Dedicated XCC management connector (1 Gb RJ45) activity LED (green): Use this green LED to distinguish the network status.

Off: The node is disconnected from a LAN.

Blinking: The network is connected and active.

5 Dedicated XCC management connector (1 Gb RJ45) link LED (green): Use this green LED to distinguish the network status.

Off: The network link is disconnected.

On: The network link is established.

6 Node power button with LED (green): Press this button to turn the node on and off manually. The states of the power LED are as follows:

Off: Power is not present or the Power Conversion Station, or the LED itself has failed.

Flashing rapidly (4 times per second): The node is turned off and is not ready to be turned on. The power button is disabled. This will last approximately 5 to 10 seconds.

Flashing slowly (once per second): The node is turned off and is ready to be turned on. You can press the power button to turn on the node.

On: The node is turned on.

7 1 Gb RJ45 Ethernet port (share-NIC) activity LED (green): Use this green LED to distinguish the network status.

Off: The node is disconnected from a LAN.

Blinking: The network is connected and active.

8 1 Gb RJ45 Ethernet port (share-NIC) link LED (green): Use this green LED to distinguish the network status.

Off: The network link is disconnected.

On: The network link is established.

9 Drive activity LED (green): If the LED is lit, it indicates that the drive is powered, but not actively reading or writing data. If the LED is flashing, the drive is being accessed.

10 11 25 Gb Ethernet port link and activity LED (green): Use this green LED to distinguish the network status.

Off: The network is disconnected.

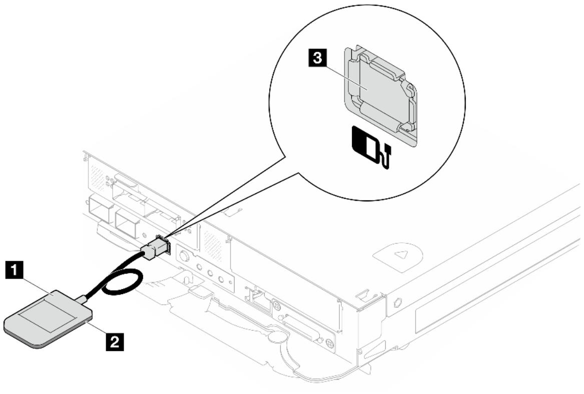
Blinking: The network is accessing.

On: The network is established.

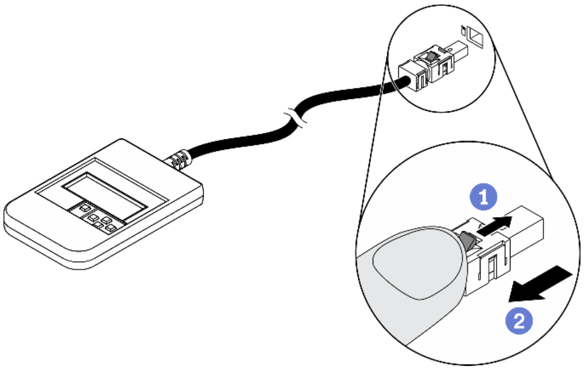
External Diagnostics Handset

The External Diagnostics Handset is an external device that is connected to the server with a cable, and it allows quick access to system information such as errors, system status, firmware, network, and health information.

Location of the External Diagnostics Handset

<table>
<tr><th>Location</th><th>Callouts</th></tr>
<tr><td rowspan="3">The External Diagnostics Handset is connected to the server with an external cable.
 </td><td>**1** External Diagnostics Handset</td></tr>
<tr><td>**2** Magnetic bottom
With this component, the diagnostic handset can be attached to the top or side of the rack with hands spared for service tasks.</td></tr>
<tr><td>**3** External diagnostics connector
This connector is located on the front of the server, and is used to connect an External Diagnostics Handset.</td></tr>
</table>

Note: When unplugging the External Diagnostics Handset, see the following instructions:

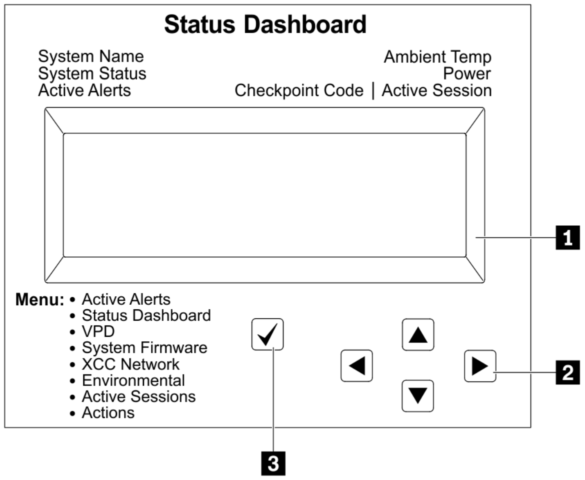


①Press the plastic clip on the plug forward.

②Hold the clip and remove the cable from the connector.

Display panel overview

The diagnostics device consists of an LCD display and 5 navigation buttons.



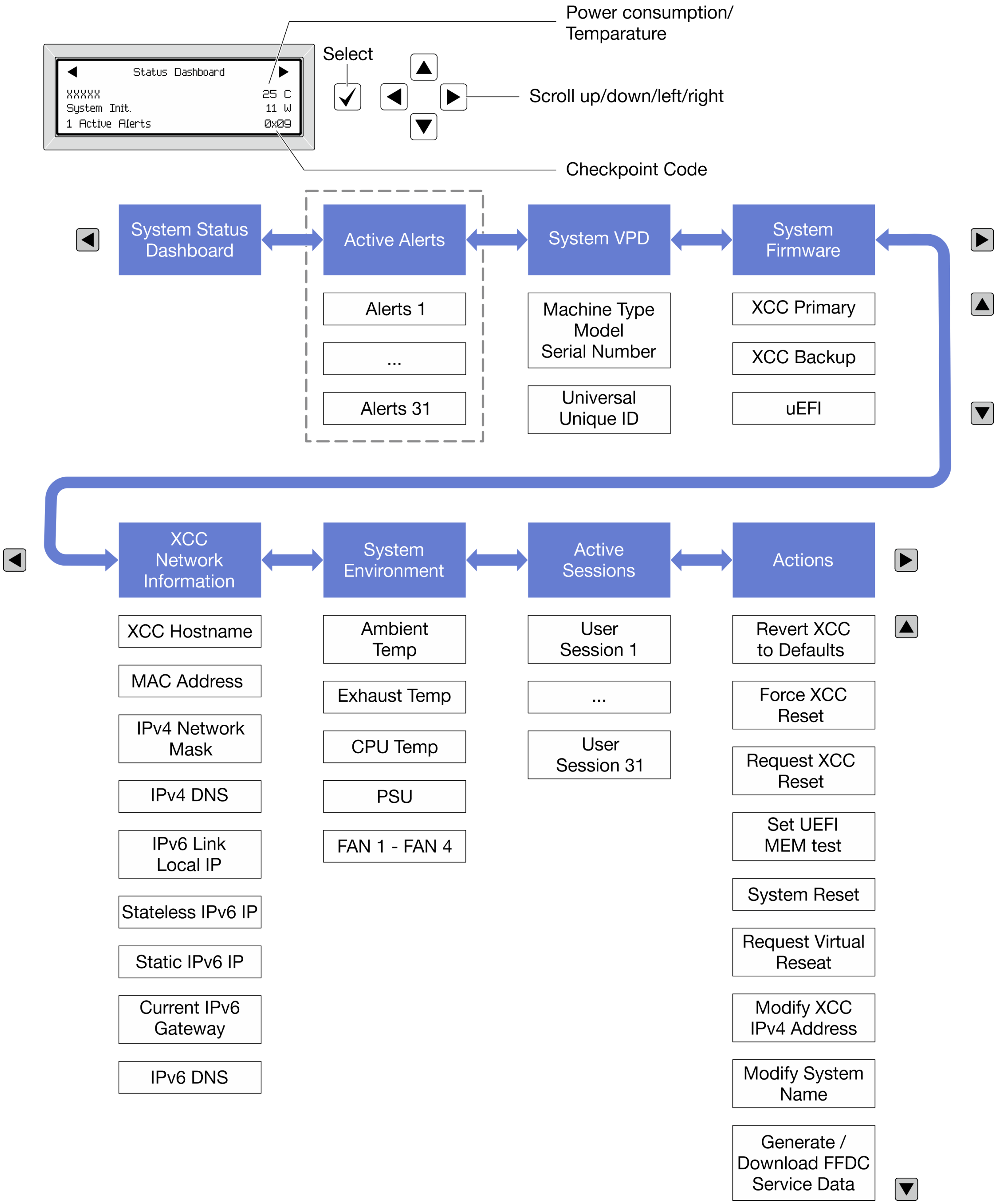
1 LCD display	
2 Scroll buttons (up/down/left/right) Press the scroll buttons to locate and select system information.	
3 Select button Press the select button to select from the options in the menu.	

Option flow diagram

Note: SC750 V4 does not support the following functions: Request Virtual Reseat, Modify XCC Static IPv4 Address, Modify System Name, and Generate/Download FFDC Service Data.

The LCD panel displays various system information. Navigate through the options with the scroll keys.

Depending on the model, the options and entries on the LCD display might be different.



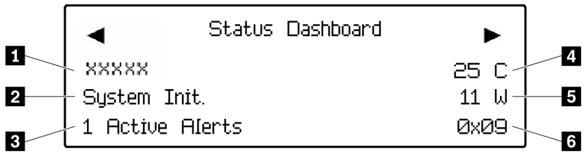
Note:

Full menu list

Following is the list of available options. Switch between an option and the subordinate information entries with the select button, and switch among options or information entries with the scroll buttons.

Depending on the model, the options and entries on the LCD display might be different.

Home Menu (System Status Dashboard)

Home Menu	Example
1 System name **2** System status **3** Active alert quantity **4** Temperature **5** Power consumption **6** Checkpoint code	

Active Alerts

Sub Menu	Example
Home screen: Active error quantity **Note:** The “Active Alerts” menu displays only the quantity of active errors. If no errors occur, the “Active Alerts” menu will not be available during navigation.	`1 Active Alerts`
Details screen: • Error message ID (Type: Error/Warning/Information) • Occurrence time • Possible sources of the error	Active Alerts: 1 Press ▼ to view alert details FQXSPPU009N(Error) 04/07/2020 02:37:39 PM CPU 1 Status: Configuration Error

System VPD Information

Sub Menu	Example
• Machine type and serial number • Universal Unique ID (UUID)	Machine Type: xxxx Serial Num: xxxxxx Universal Unique ID: xxxxxxxxxxxxxxxxxxxxxxxxxxxx

System Firmware

Sub Menu	Example

XCC Primary
- Firmware level (status)
- Build ID
- Version number
- Release date
	`XCC Primary (Active)`
	`Build: DVI399T`
	`Version: 4.07`
	`Date: 2020-04-07`

XCC Backup
- Firmware level (status)
- Build ID
- Version number
- Release date
	`XCC Backup (Active)`
	`Build: D8BT05I`
	`Version: 1.00`
	`Date: 2019-12-30`

UEFI
- Firmware level (status)
- Build ID
- Version number
- Release date
	`UEFI (Inactive)`
	`Build: D0E101P`
	`Version: 1.00`
	`Date: 2019-12-26`

XCC Network Information

Sub Menu	Example

- XCC hostname
- MAC address
- IPv4 Network Mask
- IPv4 DNS
- IPv6 Link Local IP
- Stateless IPv6 IP
- Static IPv6 IP
- Current IPv6 Gateway
- IPv6 DNS
Note: Only the MAC address that is currently in use is displayed (extension or shared).
	`XCC Network Information`
	`XCC Hostname: XCC-xxxx-SN`
	`MAC Address:`
	`xx:xx:xx:xx:xx:xx`
	`IPv4 IP:`
	`xx.xx.xx.xx`
	`IPv4 Network Mask:`
	`x.x.x.x`
	`IPv4 Default Gateway:`
	`x.x.x.x`

System Environmental Information

Sub Menu	Example

• Ambient temperature
• Exhaust temperature
• CPU temperature
• PSU status
• Spinning speed of fans by RPM
	`Ambient Temp: 24 C`
	`Exhaust Temp: 30 C`
	`CPU1 Temp: 50 C`
	`PSU1: Vin= 213 w`
	`Inlet= 26 C`
	`FAN1 Front: 21000 RPM`
	`FAN2 Front: 21000 RPM`
	`FAN3 Front: 21000 RPM`
	`FAN4 Front: 21000 RPM`

Active Sessions

Sub Menu	Example
Quantity of active sessions	`Active User Sessions: 1`

Actions

Note: SC750 V4 does not support the following functions: Request Virtual Reseat, Modify XCC Static IPv4 Address, Modify System Name, and Generate/Download FFDC Service Data.

Sub Menu	Example

Several quick actions are available:
• Revert XCC to Defaults
• Force XCC Reset
• Request XCC Reset
• Set UEFI Memory Test
• Request Virtual Reseat
• Modify XCC Static IPv4 Address/Net mask/Gateway
• Modify System Name
• Generate/Download FFDC Service Data
	`Request XCC Reset?`
	`This will request the BMC to reboot itself.`
	`Hold √ for 3 seconds`

System Management Module 3 (SMM3) LEDS

The following illustration shows the LEDs on the SMM3 module.

SMM3 LEDs

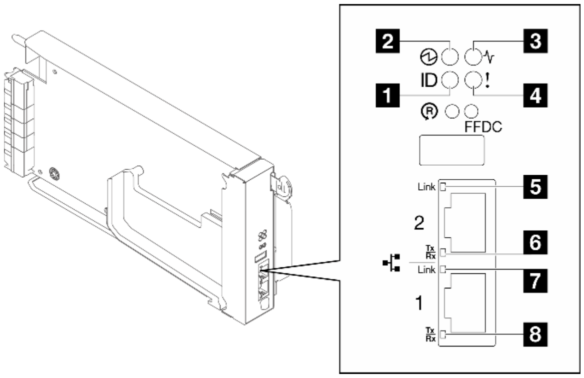


Figure 512. SMM3 LEDs

Table 28. SMM3 connectors and LEDs

1 Identification LED (blue)	**5** Ethernet port 2 link (RJ-45) LED (green)
2 Power LED (green)	**6** Ethernet port 2 activity (RJ-45) LED (green)
3 Status LED (green)	**7** Ethernet port 1 link (RJ-45) LED (green)
4 Check log LED (yellow)	**8** Ethernet port 1 activity (RJ-45) LED (green)

1 **Identification LED**: When this LED is lit (blue), it indicates the enclosure location in a rack.

2 **Power-on LED**: When this LED is lit (green), it indicates that the SMM3 has power.

3 **Status LED**: This LED (green) indicates the operating status of the SMM3.

- **Continuously on**: The SMM3 has encountered one or more problems.
- **Off**: When the enclosure power is on, it indicates the SMM3 has encountered one or more problems.
- **Flashing**: The SMM3 is working.
  - During the pre-boot process, the LED flashes at 1 Hz then change to keep on.
    - LED flashes at 1 Hz: the SMM3 hardware is working and ready to initialize.
    - LED keeps on: SMM3 is initializing.
    - When the pre-boot process and initialization are completed and the SMM3 is working correctly, the LED flashes at 1 Hz (once every second).

4 **Check log LED**: When this LED is lit (yellow), it indicates that a system error has occurred. Check the SMM3 event log for additional information.

5 **Ethernet port 2 link (RJ-45) LED**: When this LED is lit (green), it indicates that there is an active connection through the remote management and console (Ethernet) port 2 to the management network.

6 **Ethernet port 2 activity (RJ-45) LED**: When this LED is flashing (green), it indicates that there is an activity through the remote management and console (Ethernet) port 2 over the management network.

7 **Ethernet port 1 link (RJ-45) LED**: When this LED is lit (green), it indicates that there is an active connection through the remote management and console (Ethernet) port 1 to the management network.

8 **Ethernet port 1 activity (RJ-45) LED**: When this LED is flashing (green), it indicates that there is an activity through the remote management and console (Ethernet) port 1 over the management network.

Power Conversion Station (PCS) LEDs

This topic provides information about various power conversion station (PCS) LED status and corresponding action suggestions.

The following minimal configuration is required for the solution to start:

- One N1380 enclosure
- One SC750 V4 tray
- Two 32GB 2Rx8 DDR5 RDIMM per node in slot 7 and slot 18. (one DIMM per processor)
- Three 15000W Power Conversion Stations (PCS)
- One drive (any type) (If OS is needed for debugging)

- One N1380 enclosure
- One SC777 V4 tray
- One GB200-NVL4 board
- Two SOCAMM memory
- Two 15000W Power Conversion Stations (PCS)
- One drive (any type) (If OS is needed for debugging)

The Power Conversion Station get electrical power from a 380 - 480 V ac power source and convert the ac input into 48 V outputs. The Power Conversion Station are capable of autoranging within the input voltage range. There is one common power domain for the enclosure that distributes power to each of the tray and modules through the system interposer.

AC redundancy is achieved by distributing the ac power cord connections between independent ac circuits.

Each Power Conversion Station has internal water loops and a controller. The Power Conversion Station controller can be powered by any installed Power Conversion Station that is providing power through the interposer.

The enclosure does not support mixing of low input voltage Power Conversion Station with high input voltage power conversion stations. For example, if you install a Power Conversion Station with an input voltage of 100 - 127 V ac in a enclosure that is powered by 200 - 240 V ac Power Conversion Stations, the 100 - 127 V Power Conversion Station will not power on. The same restriction applies to a enclosure that is powered by 100 - 127 V ac Power Conversion Stations. If you install a 200 - 240 V ac Power Conversion Station in an enclosure that is powered by 100 - 127 V ac Power Conversion Stations, the 200 - 240 V ac Power Conversion Station will not power on.

The following illustration shows the LEDs on the Power Conversion Station:

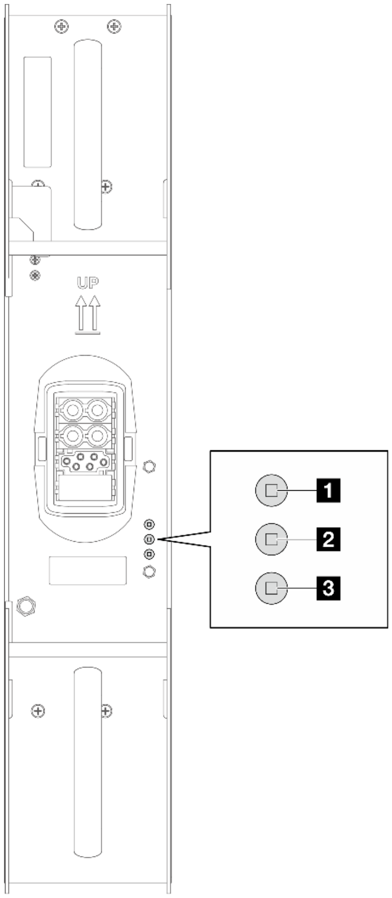


Figure 513. Power Conversion Station (PCS) LEDs

1 Input (AC) power LED (green)	**3** Power Conversion Station (PCS) LED (yellow)
2 Output (DC) power LED (green)	

There are three LEDs on each DWC PCS :

1 **AC power LED (green)**: When this LED is lit (green), it indicates that ac power is being supplied to the PCS in the corresponding PCS bay.

2 **DC power LED (green)**: When this LED is lit (green), it indicates that dc power is being supplied from the corresponding PCS bay to the enclosure interposer.

3 **Power Conversion Station (PCS) error LED (yellow)**: When this LED is lit (yellow), it indicates that there is a fault with the corresponding PCS bay. Dump the FFDC log from the system and contact Lenovo back end support team for PCS data log reviewing.

Note: Before unplugging the ac power cord from the DWC Power Conversion Station, or removing the DWC Power Conversion Station from the enclosure, verify that the capacity of the remaining Power Conversion Stations are sufficient to meet the minimum power requirements for all components in the enclosure.

System-I/O-board (DCSCM) LEDs

The following illustrations show the light-emitting diodes (LEDs) on the system I/O board (DCSCM).

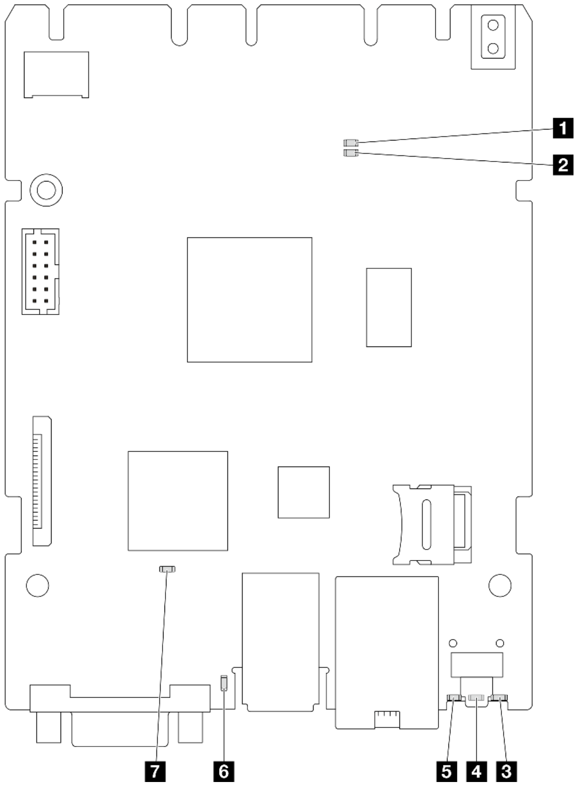


Figure 514. LEDs on the system I/O board

1 AP0 LED (green)

2 AP1 LED (green)

3 RoT fault LED (yellow)

4 System error LED (yellow)

5 System ID LED (blue)

6 XCC heartbeat LED (green)

7 SCM FPGA heartbeat LED (green)

Table 29. LEDs description

Scenario	**1 AP0 LED**	**2 AP1 LED**	**3 RoT fault LED**	**7 SCM FPGA heart-beat LED**	**6 XCC heart-beat LED**	**Actions**
RoT security module fatal firmware failure	Off	Off	On	N/A	N/A	Replace the system I/O board.
	Blink	N/A	On	N/A	N/A	Replace the system I/O board.
	Blink	N/A	On	On	N/A	Replace the system I/O board.

Table 29. LEDs description (continued)

Scenario	**1 AP0 LED**	**2 AP1 LED**	**3 RoT fault LED**	**7 SCM FPGA heart-beat LED**	**6 XCC heart-beat LED**	**Actions**
No system power (FPGA heartbeat LED off)	Off	Off	Off	Off	Off	If the AC power is on, but the system board assembly does not have power, then: 1. Check the Power Conversion Station (PCS) or power distribution board (PDB) if any. If the PCS or PDB has any error, replace it. 2. If the PCS or PDB is good, do the following: a. Replace the system I/O board. b. Replace the processor board.
XCC firmware recoverable error	Blink	N/A	Off	N/A	N/A	Information only. No action is required.
XCC firmware is recovered from error	Blink	N/A	Off	N/A	N/A	Information only. No action is required.
UEFI firmware authentication failure	N/A	Blink	Off	N/A	N/A	Information only. No action is required.
UEFI firmware is recovered from authentication failure	N/A	On	Off	N/A	N/A	Information only. No action is required.
System is OK (FPGA heartbeat LED is On)	On	On	Off	On	On	Information only. No action is required.

4 System error LED (yellow)	
Description	When this yellow LED is lit, another one or more LEDs in the server might also be lit to direct you to the error source.
Action	Check system logs or internal error LEDs to identify the failed part. For more information, see “Front LEDs” on page 439.

5 System ID LED (blue)	
Description	The front system ID LED helps you locate the server.
Action	Each time you press the system ID button, the state of both system ID LEDs changes, and the state can be on, blinking, or off.

6 XCC heartbeat LED (green)	
Description	The XCC heartbeat LED helps you identify the XCC status. • Blinking (about one flash per second) : XCC is working normally. • Blinking at other speeds or always on: XCC is at the initial phase or is working abnormally. • Off: XCC is not working.
Action	• If the XCC heartbeat LED is always off or always on, do the following: – If XCC cannot be accessed: 1. Re-plug the power cord. 2. Check and ensure that the system I/O board is installed correctly. (Trained technicians only) Reinstall it if needed. 3. (Trained technicians only) Replace the system I/O board. – If XCC can be accessed, replace the system I/O board. • If the XCC heartbeat LED is always blinking fast over 5 minutes, do the following: 1. Re-plug the power cord. 2. Check and ensure that the system I/O board is installed correctly. (Trained technicians only) Reinstall it if needed. 3. (Trained technicians only) Replace the system I/O board. • If the XCC heartbeat LED is always blinking slow over 5 minutes, do the following: 1. Re-plug the power cord. 2. Check and ensure that the system I/O board is installed correctly. (Trained technicians only) Reinstall it if needed. 3. If the problem remains, contact Lenovo Support.

General problem determination procedures

Use the information in this section to resolve problems if the event log does not contain specific errors or the server is inoperative.

If you are not sure about the cause of a problem and the Power Conversion Stations are working correctly, complete the following steps to attempt to resolve the problem:

1. Power off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices if applicable, one at a time, until you find the failure. Power on and configure the server each time you remove or disconnect a device.
   - Any external devices.
   - Surge-suppressor device (on the server).
   - Printer, mouse, and non-Lenovo devices.
   - Each adapter.
   - Hard disk drives.
   - Memory modules until you reach the minimal configuration for debugging that is supported for the server.

     To determine the minimal configuration for your server, see “Minimal configuration for debugging” in “Technical specifications” on page 4:
4. Power on the server.

If the problem is solved when you remove an adapter from the server, but the problem recurs when you install the same adapter again, suspect the adapter. If the problem recurs when you replace the adapter with a different one, try a different PCIe slot.

If the problem appears to be a networking problem and the server passes all system tests, suspect a network cabling problem that is external to the server.

Resolving suspected power problems

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

Complete the following steps to diagnose and resolve a suspected power problem.

Step 1. Check the event log and resolve any errors related to the power.

Note: Start with the event log of the application that is managing the server. For more information about event logs, see "Event logs" on page 437.

Step 2. Check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.

Step 3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimal configuration for debugging that is required for the server to start. To determine the minimal configuration for your server, see "Technical specifications" on page 4.

Step 4. Reconnect all AC power cords and turn on the server. If the server starts successfully, reseat the adapters and devices one at a time until the problem is isolated.

If the server does not start from the minimal configuration, replace the components in the minimal configuration one at a time until the problem is isolated.

Resolving suspected Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. See the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device-driver readme file.

Complete the following steps to attempt to resolve suspected problems with the Ethernet controller.

Step 1. Make sure that the correct device drivers, which come with the server are installed and that they are at the latest level.

Step 2. Make sure that the Ethernet cable is installed correctly.

- The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
- If you set the Ethernet controller to operate at 100 Mbps or 1000 Mbps, you must use Category 5 cabling.

Step 3. Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.

Step 4. Check the Ethernet controller LEDs on the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.

Ethernet controller LED locations are specified in "Troubleshooting by system LEDs and diagnostics display" on page 439.

- The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
- The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Step 5. Check the Network activity LED on the server. The Network activity LED is lit when data is active on the Ethernet network. If the Network activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.

Network activity LED location is specified in "Troubleshooting by system LEDs and diagnostics display" on page 439.

Step 6. Check for operating-system-specific causes of the problem, and also make sure that the operating system drivers are installed correctly.

Step 7. Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible causes of the error.

Troubleshooting by symptom

Use this information to find solutions to problems that have identifiable symptoms.

To use the symptom-based troubleshooting information in this section, complete the following steps:

1. Check the event log of the application that is managing the server and follow the suggested actions to resolve any event codes.
   - If you are managing the server from the Lenovo XClarity Administrator, begin with the Lenovo XClarity Administrator event log.
   - If you are using some other management application, begin with the Lenovo XClarity Controller event log.

   For more information about event logs (see "Event logs" on page 437).
2. Review this section to find the symptoms that you are experiencing and follow the suggested actions to resolve the issue.
3. If the problem persists, contact support (see "Contacting Support" on page 479).

Intermittent problems

Use this information to solve intermittent problems.

- "Intermittent external device problems" on page 455
- "Intermittent KVM problems" on page 456
- "Intermittent unexpected reboots" on page 456

Intermittent external device problems

Complete the following steps until the problem is solved.

1. Update the UEFI and XCC firmware to the latest versions.
2. Make sure that the correct device drivers are installed. See the manufacturer's website for documentation.
3. For a USB device:

a. Make sure that the device is configured correctly.

   Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.

b. Connect the device to another port. If using a USB hub, remove the hub and connect the device directly to the compute node. Make sure that the device is configured correctly for the port.

Intermittent KVM problems

Complete the following steps until the problem is solved.

Video problems:

1. Make sure that all cables and the console breakout cable are properly connected and secure.
2. Make sure that the monitor is working properly by testing it on another compute node.
3. Test the console breakout cable on a working compute node to ensure that it is operating properly. Replace the console breakout cable if it is defective.

Keyboard problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Mouse problems:

Make sure that all cables and the console breakout cable are properly connected and secure.

Intermittent unexpected reboots

Note: Some uncorrectable errors require that the server reboot so that it can disable a device, such as a memory DIMM or a processor to allow the machine to boot up properly.

1. If the reset occurs during POST and the POST watchdog timer is enabled, make sure that sufficient time is allowed in the watchdog timeout value (POST Watchdog Timer).

   To check the POST watchdog time, restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the “Startup” section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) Then, click **System Settings → Recovery and RAS → System Recovery → POST Watchdog Timer**.

2. If the reset occurs after the operating system starts, enter the operating system when the system operates normally and set up operating system kernel dump process (Windows and Linux base operating systems will be using different method). Enter the UEFI setup menus and disable the feature, or disable it with the following OneCli command.

   ```
   OneCli.exe config set SystemRecovery.RebootSystemOnNMI Disable --bmcxcc_userid PASSWORD@xcc_ipaddress
   ```

3. See the management controller event log to check for an event code that indicates a reboot. See “Event logs” on page 437 for information about viewing the event log. If you are using Linux base operating system, then capture all logs back to Lenovo support for further investigation.

Keyboard, mouse, KVM switch or USB-device problems

Use this information to solve problems related to a keyboard, mouse, KVM switch or USB-device problems.

- “All or some keys on the keyboard do not work” on page 457
- “Mouse does not work” on page 457

- "KVM switch problems" on page 457
- "USB-device does not work" on page 457

All or some keys on the keyboard do not work

1. Make sure that:
   - The keyboard cable is securely connected.
   - The server and the monitor are turned on.
2. If you are using a USB keyboard, run the Setup utility and enable keyboardless operation.
3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the server.
4. Try to install the USB keyboard into a different USB port as available.
5. Replace the keyboard.

Mouse does not work

1. Make sure that:
   - The mouse cable is securely connected to the server.
   - The mouse device drivers are installed correctly.
   - The server and the monitor are turned on.
   - The mouse option is enabled in the Setup utility.
2. If you are using a USB mouse and it is connected to a USB hub, disconnect the mouse from the hub and connect it directly to the server.
3. Try to install the USB mouse into a different USB port as available.
4. Replace the mouse.

KVM switch problems

1. Make sure that the KVM switch is supported by your server.
2. Make sure that the KVM switch is powered on correctly.
3. If the keyboard, mouse or monitor can be operated normally with direct connection to the server, then replace the KVM switch.

USB-device does not work

1. Make sure that:
   - The correct USB device driver is installed.
   - The operating system supports USB devices.
2. Make sure that the USB configuration options are set correctly in system setup.

   Restart the server and press the key according to the on-screen instructions to display the LXPM system setup interface. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) Then, click **System Settings → Devices and I/O Ports → USB Configuration**.
3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

Memory problems

See this section to resolve issues related to memory.

Common memory problems

- "Multiple memory modules in a channel identified as failing" on page 458
- "Displayed system memory is less than installed physical memory" on page 458
- "Invalid memory population detected" on page 459

Multiple memory modules in a channel identified as failing

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

Complete the following procedure to solve the problem.

1. Reseat the memory modules; then, restart the server.
2. Remove the highest-numbered memory module of those that are identified and replace it with an identical known good memory module; then, restart the server. Repeat as necessary. If the failures continue after all identified memory modules are replaced, go to step 4.
3. Return the removed memory modules, one at a time, to their original connectors, restarting the server after each memory module, until a memory module fails. Replace each failing memory module with an identical known good memory module, restarting the server after each memory module replacement. Repeat step 3 until you have tested all removed memory modules.
4. Replace the highest-numbered memory module of those identified; then, restart the server. Repeat as necessary.
5. Reverse the memory modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
7. (Trained technician only) Replace the system board (system board assembly).

Displayed system memory is less than installed physical memory

Complete the following procedure to solve the problem.

Note: Each time you install or remove a memory module, you must disconnect the server from the power source; then, wait 10 seconds before restarting the server.

1. Make sure that:
    - No error LEDs are lit. See "Troubleshooting by system LEDs and diagnostics display" on page 439.
    - No memory module error LEDs are lit on the system board (system board assembly).
    - Memory mirrored channel does not account for the discrepancy.
    - The memory modules are seated correctly.
    - You have installed the correct type of memory module (see "Memory module installation rules and order" on page 36 for requirements).
    - After changing or replacing a memory module, memory configuration is updated accordingly in the Setup Utility.
    - All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
    - There is no memory mismatch when the server is at the minimum memory configuration.
2. Reseat the memory modules, and then restart the server.
3. Check the POST error log:

  - If a memory module was disabled by a systems-management interrupt (SMI), replace the memory module.
  - If a memory module was disabled by the user or by POST, reseat the memory module; then, run the Setup Utility and enable the memory module.
4. Run memory diagnostics. When you start a solution and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) You can perform memory diagnostics with this interface. From the Diagnostic page, go to **Run Diagnostic → Memory test → Advanced Memory Test**.
5. Reverse the modules between the channels (of the same processor), and then restart the server. If the problem is related to a memory module, replace the failing memory module.
6. Re-enable all memory modules using the Setup Utility, and then restart the server.
7. (Trained technician only) Install the failing memory module into a memory module connector for processor 2 (if installed) to verify that the problem is not the processor or the memory module connector.
8. (Trained technician only) Replace the system board (system board assembly).

Invalid memory population detected

If this warning message appears, complete the following steps:

```
Invalid memory population (unsupported DIMM population) detected. Please verify memory configuration is valid.
```

1. See "Memory module installation rules and order" on page 36 to make sure the present memory module population sequence is supported.
2. If the present sequence is indeed supported, see if any of the modules is displayed as "disabled" in Setup Utility.
3. Reseat the module that is displayed as "disabled," and reboot the system.
4. If the problem persists, replace the memory module.

Monitor and video problems

Use this information to solve problems related to a monitor or video.

- "Screen is blank" on page 459
- "Screen goes blank when you start some application programs" on page 460
- "The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted" on page 460

Screen is blank

1. If the server is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the rear of the server.
2. The management controller remote presence function is disabled if you install an optional video adapter. To use the management controller remote presence function, remove the optional video adapter.
3. If the server is installed with the graphical adapters while turning on the server, the Lenovo logo is displayed on the screen after approximately 3 minutes. This is normal operation while the system loads.
4. Make sure that:
   - The server is turned on and there is power supplied to the server.
   - The monitor cables are connected correctly.
   - The monitor is turned on and the brightness and contrast controls are adjusted correctly.
5. Make sure that the correct server is controlling the monitor, if applicable.
6. Make sure that corrupted server firmware is not affecting the video; see "Update the firmware" on page 427.

7. Observe the LEDs on the system board (system board assembly); if the codes are changing, go to step 6.
8. Replace the following components one at a time, in the order shown, restarting the server each time:
   a. Monitor
   b. Video adapter (if one is installed)
   c. (Trained technician only) System board (system board assembly)

Screen goes blank when you start some application programs

1. Make sure that:
   - The application program is not setting a display mode that is higher than the capability of the monitor.
   - You installed the necessary device drivers for the application.

The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted

1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescents, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.

   Attention: Moving a color monitor while it is turned on might cause screen discoloration.

   Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.

   Notes:

   a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
   b. Non-Lenovo monitor cables might cause unpredictable problems.
2. Reseat the monitor cable.
3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time:
   a. Monitor cable
   b. Video adapter (if one is installed)
   c. Monitor
   d. (Trained technician only) System board (system board assembly)

Network problems

Use this information to resolve issues related to networking.

- "Cannot wake server using Wake on LAN" on page 460
- "Could not log in using LDAP account with SSL enabled" on page 461

Cannot wake server using Wake on LAN

Complete the following steps until the problem is resolved:

1. If you are using the dual-port network adapter and the server is connected to the network using Ethernet 5 connector, check the system-error log or IMM2 system event log (see "Event logs" on page 437), make sure:
   a. Fan 3 is running in standby mode, if Emulex dual port 10GBase-T embedded adapter is installed.
   b. The room temperature is not too high (see "Specifications" on page 3).

   c. The air vents are not blocked.
   d. The air baffle is installed securely.
2. Reseat the dual-port network adapter.
3. Turn off the server and disconnect it from the power source; then, wait 10 seconds before restarting the server.
4. If the problem still remains, replace the dual-port network adapter.

Could not log in using LDAP account with SSL enabled

Complete the following steps until the problem is resolved:

1. Make sure that the license key is valid.
2. Generate a new license key and log in again.

Observable problems

Use this information to solve observable problems.

- "The server immediately displays the POST Event Viewer when it is turned on" on page 461
- "Server is unresponsive (POST is complete and operating system is running)" on page 461
- "Server is unresponsive (POST failed and cannot start System Setup)" on page 462
- "Voltage planar fault is displayed in the event log" on page 462
- "Unusual smell" on page 462
- "Server seems to be running hot" on page 462
- "Cracked parts or cracked chassis" on page 463

The server immediately displays the POST Event Viewer when it is turned on

Complete the following steps until the problem is solved.

1. Correct any errors that are indicated by the system LEDs and diagnostics display.
2. Make sure that the server supports all the processors and that the processors match in speed and cache size.

   You can view processor details from system setup.

   To determine if the processor is supported for the server, see https://serverproven.lenovo.com.
3. (Trained technician only) Make sure that processor 1 is seated correctly
4. (Trained technician only) Remove processor 2 and restart the server.
5. Replace the following components one at a time, in the order shown, restarting the server each time:
   a. (Trained technician only) Processor
   b. (Trained technician only) System board (system board assembly)

Server is unresponsive (POST is complete and operating system is running)

Complete the following steps until the problem is solved.

- If you are in the same location as the compute node, complete the following steps:
  1. If you are using a KVM connection, make sure that the connection is operating correctly. Otherwise, make sure that the keyboard and mouse are operating correctly.
  2. If possible, log in to the compute node and verify that all applications are running (no applications are hung).
  3. Restart the compute node.

   4. If the problem remains, make sure that any new software has been installed and configured correctly.
   5. Contact your place of purchase of the software or your software provider.
- If you are accessing the compute node from a remote location, complete the following steps:
   1. Make sure that all applications are running (no applications are hung).
   2. Attempt to log out of the system and log back in.
   3. Validate the network access by pinging or running a trace route to the compute node from a command line.
      a. If you are unable to get a response during a ping test, attempt to ping another compute node in the enclosure to determine whether it is a connection problem or compute node problem.
      b. Run a trace route to determine where the connection breaks down. Attempt to resolve a connection issue with either the VPN or the point at which the connection breaks down.
   4. Restart the compute node remotely through the management interface.
   5. If the problem remains, verify that any new software has been installed and configured correctly.
   6. Contact your place of purchase of the software or your software provider.

Server is unresponsive (POST failed and cannot start System Setup)

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test).

If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the server reverts to the default UEFI configuration and starts System Setup so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board (system board assembly). You can specify the number of consecutive restart attempts in System Setup. Click **System Settings → Recovery → POST Attempts → POST Attempts Limit**. Available options are 3, 6, 9, and 255.

Voltage planar fault is displayed in the event log

Complete the following steps until the problem is solved.

1. Revert the system to the minimum configuration. See “Specifications” on page 3 for the minimally required number of processors and DIMMs.
2. Restart the system.
   - If the system restarts, add each of the removed items one at a time and restart the system each time until the error occurs. Replace the item for which the error occurs.
   - If the system does not restart, suspect the system board (system board assembly).

Unusual smell

Complete the following steps until the problem is solved.

1. An unusual smell might be coming from newly installed equipment.
2. If the problem remains, contact Lenovo Support.

Server seems to be running hot

Complete the following steps until the problem is solved.

Multiple compute nodes or chassis:

1. Make sure that the room temperature is within the specified range (see "Specifications" on page 3).
2. Make sure that the fans are installed correctly.
3. Update the UEFI and XCC firmware to the latest versions.
4. Make sure that the fillers in the server are installed correctly (see Chapter 5 "Hardware replacement procedures" on page 33 for detailed installation procedures).
5. Use the IPMI command to ramp up the fan speed to the full fan speed to see whether the issue can be resolved.

   Note: The IPMI raw command should only be used by trained technician and each system has its own specific IPMI raw command.
6. Check the management processor event log for rising temperature events. If there are no events, the compute node is running within normal operating temperatures. Note that you can expect some variation in temperature.

Cannot enter legacy mode after installing a new adapter

Complete the following procedure to solve the problem.

1. Go to **UEFI Setup → Devices and I/O Ports → Set Option ROM Execution Order**.
2. Move the RAID adapter with operation system installed to the top of the list.
3. Select **Save**.
4. Reboot the system and auto boot to operation system.

Cracked parts or cracked chassis

Contact Lenovo Support.

Optional-device problems

Use this information to solve problems related to optional devices.

- "Insufficient PCIe resources are detected" on page 463
- "A Lenovo optional device that was just installed does not work" on page 464
- "A Lenovo optional device that worked previously does not work now" on page 464

Insufficient PCIe resources are detected

If you see an error message stating "Insufficient PCI Resources Detected," complete the following steps until the problem is resolved:

1. Press Enter to access System Setup Utility.
2. Select **System Settings → Devices and I/O Ports → MM Config Base**; then, modify the setting to increase the device resources. For example, modify 3 GB to 2 GB or modify 2 GB to 1 GB.
3. Save the settings and restart the system.
4. If the error recurs with the highest device resource setting (1GB), shutdown the system and remove some PCIe devices; then, power on the system.
5. If the reboot failed, repeat step 1 to step 4.
6. If the error recurs, press Enter to access System Setup Utility.
7. Select **System Settings → Devices and I/O Ports → PCI 64–Bit Resource Allocation**, then; modify the setting from **Auto** to **Enable**.
8. Contact Lenovo technical support.

A Lenovo optional device that was just installed does not work

1. Make sure that:
   - The device is supported for the server (see https://serverproven.lenovo.com).
   - You followed the installation instructions that came with the device and the device is installed correctly.
   - You have not loosened any other installed devices or cables.
   - You updated the configuration information in the Setup utility. Whenever memory or any other device is changed, you must update the configuration.
2. Reseat the device that you have just installed.
3. Replace the device that you have just installed.

A Lenovo optional device that worked previously does not work now

1. Make sure that all of the cable connections for the device are secure.
2. If the device comes with test instructions, use those instructions to test the device.
3. If the failing device is a SCSI device, make sure that:
   - The cables for all external SCSI devices are connected correctly.
   - Any external SCSI device is turned on. You must turn on an external SCSI device before you turn on the server.
4. Reseat the failing device.
5. Replace the failing device.

Power on and power off problems

Use this information to resolve issues when powering on or powering off the node.

- "Node does not power on" on page 464
- "Node does not power off" on page 465

Notes:
- For SMM3 power on problem, see "System Management Module 3 problems" on page 467.
- The system Power Conversion Stations (PCS) are installed in the N1380 enclosure.

Node does not power on

Complete the following steps until the problem is resolved:

Note: The power button will not function until approximately five to ten seconds after the node has been connected to power to allow the BMC to complete initialization.

1. Perform physical reseat or virtual reseat. Then, power on the node.
   - Physical reseat: remove the tray from the enclosure. Then, reinstall the tray back to the enclosure.
   - Virtual reseat: access SMM3 via Web GUI or IPMI commands to perform virtual reseat
2. Make sure that both Power Conversion Stations installed in the enclosure are of the same type. Mixing different Power Conversion Stations in the server will cause a system error (the system-error LED on the front operator panel turns on).
3. Make sure that:
   - The tray is installed correctly to the enclosure. See SC777 V4 user guideSee Install a tray to the enclosure.
   - The type of memory that is installed is correct and the installation rules are met.
   - The DIMMs are fully seated with lock latches fully closed.
   - The LEDs on the Power Conversion Station do not indicate a problem. See "Power Conversion Station (PCS) LEDs" on page 449.

- The processors are installed in the correct sequence.

4. If you just installed an optional device, remove it, and restart the server. If the server now starts, you might have installed more devices than the Power Conversion Station supports.
5. Implement the minimum configuration to check whether any specific components lock the power permission. Minimum configuration is as below:
   - One N1380 enclosure
   - One SC750 V4 tray
   - Two 32GB 2Rx8 DDR5 RDIMM per node in slot 7 and slot 18. (one DIMM per processor)
   - Three 15000W Power Conversion Stations (PCS)
   - One drive (any type) (If OS is needed for debugging)

   - One N1380 enclosure
   - One SC777 V4 tray
   - One GB200-NVL4 board
   - Two SOCAMM memory
   - Two 15000W Power Conversion Stations (PCS)
   - One drive (any type) (If OS is needed for debugging)
6. Collect the failure information by capturing the system logs and provide it to Lenovo support.

Node does not power off

Complete the following steps until the problem is resolved:

1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:
   a. Press `Ctrl+Alt+Delete`.
   b. Turn off the server by pressing the power button and holding it down for 5 seconds.
   c. Restart the server.
   d. If the server fails POST and the power button does not work, disconnect the power cord for 20 seconds; then, reconnect the power cord and restart the server.
2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board (system board assembly).

Power problems

Use this information to resolve issues related to power.

Note: The system Power Conversion Stations (PCS) are installed in the N1380 enclosure.

System error LED is on and event log "Power supply has lost input" is displayed

To resolve the problem, ensure that:

1. The Power Conversion Station is properly connected to a power cord.
2. The power cord is connected to a properly grounded electrical outlet for the server.
3. Make sure that the Power Conversion Station AC source is stable within the supported range.
4. Swap the Power Conversion Station to see if the issue follows the Power Conversion Station, if it follows the Power Conversion Station, then replace the failing one.
5. Review the event log and see how the problem it is to follow the event log actions to resolved the problems.

Serial-device problems

Use this information to solve problems related to serial devices.

- “Number of serial ports identified by the operating system is less than the number of installed ports” on page 466
- “Serial device does not work” on page 466

Number of serial ports identified by the operating system is less than the number of installed ports

1. Make sure that:
   - Each port is assigned a unique address in the Setup utility and none of the serial ports is disabled.
   - The serial-port adapter (if one is present) is seated correctly.
2. Reseat the serial port adapter.
3. Replace the serial port adapter.

Serial device does not work

1. Make sure that:
   - The device is compatible with the server.
   - The serial port is enabled and is assigned a unique address.
   - The device is connected to the correct connector (see “System-board assembly connectors” on page 17).
2. To enable the serial port module on Linux or Microsoft Windows, do one of the followings according to the installed operating system:

   Note: If the Serial over LAN (SOL) or Emergency Management Services (EMS) feature is enabled, the serial port will be hidden on Linux and Microsoft Windows. Therefore, it is required to disable SOL and EMS to use the serial port on operating systems for serial devices.

   - For Linux:

     Open the ipmitool and enter the following command to disable the Serial over LAN (SOL) feature:

     ```
     -I lanplus -H IP -U USERID -P PASSWORD sol deactivate
     ```
   - For Microsoft Windows:
     a. Open the ipmitool and enter the following command to disable the SOL feature:

        ```
        -I lanplus -H IP -U USERID -P PASSWORD sol deactivate
        ```
     b. Open Windows PowerShell and enter the following command to disable the Emergency Management Services (EMS) feature:

        ```
        Bcdedit /ems off
        ```
     c. Restart the server to ensure that the EMS setting takes effect.
3. Reseat the following components:
   a. Failing serial device
   b. Serial cable
4. Replace the following components one at a time, restarting the server each time:
   a. Failing serial device
   b. Serial cable
5. (Trained technician only) Replace the system board (system board assembly).

Software problems

Use this information to solve software problems.

1. To determine whether the problem is caused by the software, make sure that:
   - The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.

     Note: If you have just installed an adapter or memory, the server might have a memory-address conflict.
   - The software is designed to operate on the server.
   - Other software works on the server.
   - The software works on another server.
2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
3. Contact your place of purchase of the software.

Storage drive problems

Use this information to resolve issues related to the storage drives.

- "Server cannot recognize a drive" on page 467

Server cannot recognize a drive

Complete the following steps until the problem is solved.

1. Verify that the drive is supported for the server. See https://serverproven.lenovo.com for a list of supported drives.
2. Make sure that the drive is seated in the drive bay properly and that there is no physical damage to the drive connectors.
3. Run the diagnostics tests for the SAS/SATA adapter and drives. When you start a server and press the key according to the on-screen instructions, the LXPM interface is displayed by default. (For more information, see the "Startup" section in the LXPM documentation compatible with your server at https://pubs.lenovo.com/lxpm-overview/.) You can perform drive diagnostics from this interface. From the Diagnostic page, click **Run Diagnostic → Disk Drive Test**.

   Based on those tests:

   - If the adapter passes the test but the drives are not recognized, replace the backplane signal cable and run the tests again.
   - Replace the backplane.
   - If the adapter fails the test, disconnect the backplane signal cable from the adapter and run the tests again.
   - If the adapter fails the test, replace the adapter.

System Management Module 3 problems

Use this information to resolve issues related the to the System Management Module.

Note: The System Management Module 3 is installed in the rear of N1380 enclosure.

- "System Management Module 3 does not power on" on page 468
- "System Management Module 3 status LED is not flashing normally" on page 468
- "System Management Module 3 ping failure" on page 468

- “Failure to access XCC IP through SMM3” on page 468

System Management Module 3 does not power on

Complete the following steps until the problem is resolved:

1. Check if the Power Conversion Stations are installed correctly and Power Conversion Station LEDs are lit normally.
2. Reseat the SMM3 and check the LED status again.
3. If the problem persists, replace the SMM3.

System Management Module 3 status LED is not flashing normally

When the SMM3 is working, its status LED flashes at 1Hz (once every second).

If the SMM3 status LED is continuously on or off, it indicate the SMM3 may have encountered a problem.

Complete the following steps until the problem is resolved:

1. Reseat the SMM3.
2. If the problem persists, replace the SMM3.

System Management Module 3 ping failure

Complete the following steps until the problem is solved.

1. Check the SMM3 IP address via Lenovo XClarity Controller and to see if Ethernet port 1 or port 2 of SMM3 is linked up.
2. Alternatively, you can check SMM3 LEDs to diagnose the SMM3 status (see “System Management Module 3 (SMM3) LEDS” on page 447 for SMM3 LEDs details).
   - If the SMM3 power LED and the status LED are working abnormally, reseat the SMM3.
3. If the problem persists, replace the SMM3.

Failure to access XCC IP through SMM3

If XCC IP address is not shown on the SMM3 interface, complete the following steps until the problem is solved.

1. Re-install the system management sideband cable. See “System management sideband cable kit replacement” in *SC750 V4 User Guide*.
2. If the problem persists, re-install the FPC cable.
   a. To remove the FPC cable, see Step 8 in “Remove the front I/O board” in *SC750 V4 User Guide*.
   b. To install the FPC cable, see Step 4 in “Install the front I/O board” in *SC750 V4 User Guide*.

      If the white line on the FPC cable is still visible after inserting, check if the connector latches are fully pulled up.

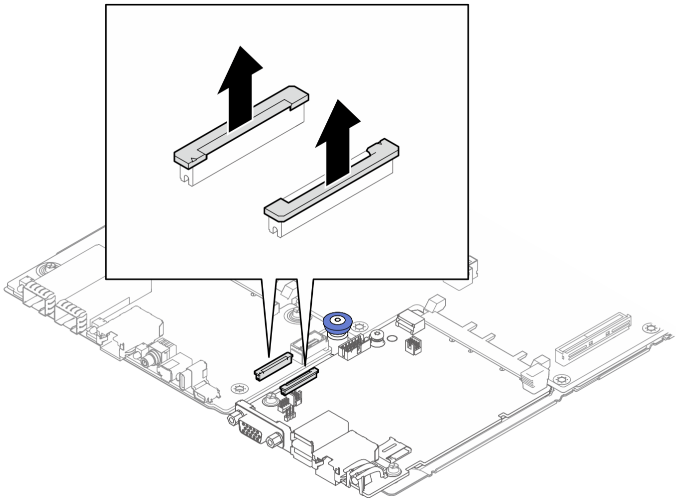


Figure 515. Pulling up connector latches

3. If the problem persists, contact Lenovo support.

Water leakage and leakage sensor problems

Use this information to resolve issues related to water leakages and leakage sensor.

The N1380 enclosure and the SC750 V4 traySC777 V4 tray design is robust, and is unlikely to leak. If the water is observed outside of the enclosure, make sure the both enclosure and enclosure Power Conversion Stations (PCS) have been disconnected. If no water is observed outside of the enclosure, but there is a suspicion of a water leakage in the enclosure or in one of the eight trays, complete the following steps to determine the source of the leak.

Notes:

- A small leakage may not reach either of the leak sensors to trigger a warning. Visual confirmation of a small leakage may be required.
- The procedures above only cover the Lenovo DWC solution (from the Eaton Ball valves up through the manifold and into the enclosures and trays). If your datacenter Cooling Distribution Unit experiences repeated or frequent low water alerts then you should inspect the data center plumbing between the Cooling Distribution Unit and the Lenovo DWC solution (rack).

This section consists of the following information:

- "Suspicious leakage symptoms" on page 469
- "Possible causes of leakage" on page 470
- "Identify the type of leakage with SMM3 messages" on page 470
- "Identify the type of leakage with Power Conversion Station (PCS) LEDs behavior" on page 471
- "Identify the type of leakage with XCC warning messages" on page 472
- "Enclosure leakage problem troubleshooting" on page 472
- "Tray leakage problem troubleshooting" on page 473
- "Power Conversion Station (PCS) leakage problem troubleshooting" on page 474
- "Disconnecting power cords from all Power Conversion Stations (PCS)" on page 474

Suspicious leakage symptoms

The following situations might occur due to leakage problems:

- **Processor over temperature error indicated by the System Error "!" LED being solid ON at the front of the node**
- **The entire enclosure shut down unexpectedly (including all nodes, PCS, and SMM3)**

- **Enclosure SMM3 management may report the events related to water leakages and leakage sensor, see below for more information.**

Possible causes of leakage

The following are the possible causes of leakage:

- **Leakage at quick connects during installation or removal procedures**
- **Leakage in the water loop tubing**

Identify the type of leakage with SMM3 messages

Follow the procedures below to identify the type of leakage with SMM3 messages.

1. Check the SMM3 messages.
   - When leakage happens, a power-on node will shut down in five seconds, and a power-off node will shut down in one second. In common practices, there is a centralized server management tool that collects the SMM3 messages. Check the management tool for SMM3 messages.
2. Determine which components to inspect according to the SMM3 messages.
   a. **Enclosure leakage messages**
      1) Check user action in ThinkSystem N1380 Neptune Enclosure SMM3 Messages and Codes Reference
      2) Follow detailed procedures in "Enclosure leakage problem troubleshooting" on page 472

Enclosure leakage SMM3 messages ID	Severity	Description	Information
1A07010027	Warning	Chassis LeakSnsr Other FRU, transition to Non-Critical from OK was asserted.	Leakage sensor is abnormal.
1A07020027	Critical	Chassis LeakSnsr: Other FRU, transition to Critical from less severe was asserted.	Leakage was detected.
1A07030027	Critical	Chassis LeakSnsr: Other FRU, transition to Non-recoverable from less severe.	Leakage sensor is absent.

   b. **Tray leakage messages**
      1) Check user action in ThinkSystem N1380 Neptune Enclosure SMM3 Messages and Codes Reference
      2) Follow detailed procedures in "Tray leakage problem troubleshooting" on page 473

Tray leakage SMM3 messages ID	Severity	Description	Information
1A07010028 / 1A07010029 / 1A0701002A / 1A0701002B / 1A0701002C / 1A0701002D / 1A0701002E / 1A0701002F	Warning	Tray 1 / Tray 2 / Tray 3 / Tray 4 / Tray 5 / Tray 6 / Tray 7 / Tray 8 : Tray # LeakSnsr : Other FRU, transition to Non-Critical from OK was asserted.	Leakage sensor is abnormal.
1A07020028 / 1A07020029 / 1A0702002A / 1A0702002B / 1A0702002C / 1A0702002D / 1A0702002E / 1A0702002F	Critical	Tray 1 / Tray 2 / Tray 3 / Tray 4 / Tray 5 / Tray 6 / Tray 7 / Tray 8 : Tray # LeakSnsr : Other FRU, transition to Critical from less severe was asserted.	Leakage was detected.
1A07030028 / 1A07030029 / 1A0703002A / 1A0703002B / 1A0703002C / 1A0703002D / 1A0703002E / 1A0703002F	Critical	Tray 1 / Tray 2 / Tray 3 / Tray 4 / Tray 5 / Tray 6 / Tray 7 / Tray 8 : Tray # LeakSnsr: Other FRU, transition to Non-recoverable from less severe was asserted.	Leakage sensor is absent.

c. **Power Conversion Station (PCS) leakage messages**

- Check user action in ThinkSystem N1380 Neptune Enclosure SMM3 Messages and Codes Reference
- Follow detailed procedures in "Power Conversion Station (PCS) leakage problem troubleshooting" on page 474

PCS leakage SMM3 messages ID	Severity	Affected PCS	Description	Information
086F01006C	Critical	PCS 1	PCS # Leakage : Power Supply, Failure Detected was asserted.	Leakage was detected.
086F01006D	Critical	PCS 2		
086F01006E	Critical	PCS 3		
086F01006F	Critical	PCS 4		

Identify the type of leakage with Power Conversion Station (PCS) LEDs behavior

Follow the procedures below to identify the type of leakage with PCS LEDs.

Table 30. Power Conversion Station (PCS) LEDs behavior for leakage identification

PCS LEDs behavior	Indication
• Input (AC) power LED: OFF • Output (DC) power LED: OFF • Error LED: **ON**	PCS leakage. Leakage occurred in the PCS with the Error LED ON. To inspect leakage, see "Power Conversion Station (PCS) leakage problem troubleshooting" on page 474.
• Input (AC) power LED: ON • Output (DC) power LED: OFF • Error LED: **OFF**	Enclosure leakage or tray leakage. To inspect leakage, see "Enclosure leakage problem troubleshooting" on page 472 and "Tray leakage problem troubleshooting" on page 473.

Identify the type of leakage with XCC warning messages

XCC web interface also shows warning messages related to water leakage or leakage sensor problems. To view XCC warning messages, go to **XCC web interface → Events**.

XCC web GUI warning messages	Indication	Actions
The cooling liquid has leaked to critical state with sensor Chassis Drip	Enclosure leakage.	To inspect water leakage or check leakage sensor, see "Enclosure leakage problem troubleshooting" on page 472.
The cooling liquid has leaked to non-recoverable state with sensor Chassis Drip	Enclosure leakage sensor may be absent or abnormal. Check if the enclosure leakage sensor is installed properly.	
The cooling liquid has leaked to critical state with sensor Tray Drip	Tray leakage.	To inspect water leakage or check leakage sensor, see "Tray leakage problem troubleshooting" on page 473.
The cooling liquid has leaked to non-recoverable state with sensor Tray Drip	Tray leakage sensor may be absent or abnormal. Check if the enclosure leakage sensor is installed properly.	

Enclosure leakage problem troubleshooting

Complete the following steps in order until you are able to isolate the cause of the potential leak.

Make preparation for this task:

1. Make sure to disconnect power cords from all PCS. See "Disconnecting power cords from all Power Conversion Stations (PCS)" on page 474.
2. Make sure you have the following items at hand:
   a. A new enclosure leakage sensor (if leakage was detected)
   b. Stubby screwdriver
   c. An absorbent cloth
3. Access the enclosure mid-plate. Inspect the manifolds for moisture. See https://pubs.lenovo.com/n1380/remove_the_enclosure_mid_plate.

   Note: It is important to visually inspect the bottom of the enclosure with a flashlight prior to re-installing the components into the enclosure.

If enclosure leakage sensor is abnormal or absent:

1. Check if the enclosure leakage sensor is correctly installed. To reinstall the enclosure leakage sensor, see https://pubs.lenovo.com/n1380/leakage_sensor_replacement.

2. Use the absorbent cloth to dry the wet components or inside of the enclosure whenever necessary.
3. Reinstall all components back to the enclosure. Then, connect the power cords to all the enclosure PCS, and power on the enclosure. See:
   - https://pubs.lenovo.com/n1380/hardware_replacement_procedures
   - https://pubs.lenovo.com/sc750-v4/hardware_replacement_procedures
   - https://pubs.lenovo.com/sc777-v4/hardware_replacement_procedures
4. If you are unable to identify the problem in the steps above, then you may need to contact Product Engineer for the further assistance.

If enclosure leakage is detected:

1. Remove the trays from the enclosure. Inspect the tray-rear-end quick connects for moisture. See https://pubs.lenovo.com/n1380/remove_a_water_cooled_technology_trayhttps://pubs.lenovo.com/sc777-v4/remove_a_water_cooled_technology_tray.
2. If the manifolds or quick connects have leakage problem, discard it. Then, install a new one. See:
   - https://pubs.lenovo.com/n1380/manifold_replacement, or
   - https://pubs.lenovo.com/sc750-v4/water_loop_replacement
   - https://pubs.lenovo.com/sc777-v4/water_loop_replacement
3. Replace the leakage sensor with a new one. See https://pubs.lenovo.com/n1380/leakage_sensor_replacement.
4. Reinstall all components back to the enclosure. Then, connect the power cords to all the enclosure PCS, and power on the enclosure. See:
   - https://pubs.lenovo.com/n1380/hardware_replacement_procedures
   - https://pubs.lenovo.com/sc750-v4/hardware_replacement_procedures
   - https://pubs.lenovo.com/sc777-v4/hardware_replacement_procedures
5. If you are unable to identify the problem in the steps above, then you may need to contact Product Engineer for the further assistance.

Tray leakage problem troubleshooting

Complete the following steps in order until you are able to isolate the cause of the potential leak:

Make preparation for this task:

1. Make sure to disconnect power cords from all PCS. See "Disconnecting power cords from all Power Conversion Stations (PCS)" on page 474.
2. Make sure you have the following items at hand:
   a. A new tray leakage sensor (if leakage was detected)
   b. An absorbent cloth
3. SMM3 message has reported a tray with leakage problem. Remove the reported tray from the enclosure. Also, remove the trays on the right and on the left of the reported tray from the enclosure. Remove the tray top cover and inspect the water loop for moisture. See **https://pubs.lenovo.com/sc750-v4/remove_a_tray_coverhttps://pubs.lenovo.com/sc777-v4/tray_cover_replacement**.
4. Use the absorbent cloth to dry the wet components or inside of the tray and enclosure whenever necessary.

   Note: It is important to visually inspect the bottom of the enclosure with a flashlight prior to re-installing the components into the tray and enclosure.

If tray leakage sensor is abnormal or absent:

1. Check if the tray leakage sensor is correctly installed. To reinstall the tray leakage sensor, see **https://pubs.lenovo.com/sc750-v4/leakage_sensor_module_replacementhttps://pubs.lenovo.com/sc777-v4/leakage_sensor_module_replacement**.
2. Reinstall all components back to the enclosure. Then, connect the power cords to all the enclosure PCS, and power on the enclosure. See https://pubs.lenovo.com/sc750-v4/hardware_replacement_procedureshttps://pubs.lenovo.com/sc777-v4/hardware_replacement_procedures.
3. If you are unable to identify the problem in the steps above, then you may need to contact Product Engineer for the further assistance.

If tray leakage is detected:

1. If the water loop has leakage problem, discard it. Then, install a new one. See https://pubs.lenovo.com/sc750-v4/water_loop_replacementhttps://pubs.lenovo.com/sc777-v4/water_loop_replacement.
2. Replace the tray leakage sensor with a new one. See **https://pubs.lenovo.com/sc750-v4/leakage_sensor_module_replacementhttps://pubs.lenovo.com/sc777-v4/leakage_sensor_module_replacement**.
3. Reinstall all components back to the enclosure. Then, connect the power cords to all the enclosure PCS, and power on the enclosure. See https://pubs.lenovo.com/sc750-v4/hardware_replacement_procedureshttps://pubs.lenovo.com/sc777-v4/hardware_replacement_procedures對的.
4. If you are unable to identify the problem in the steps above, then you may need to contact Product Engineer for the further assistance.

Power Conversion Station (PCS) leakage problem troubleshooting

Complete the following steps in order until you are able to isolate the cause of the potential leak:

1. Make sure to disconnect power cords from all PCS. See "Disconnecting power cords from all Power Conversion Stations (PCS)" on page 474.
2. Make sure you have the following items at hand:
   a. A new Power Conversion Station (PCS)
   b. An absorbent cloth
3. SMM3 message has reported a PCS with leakage problem. The PCS Leds also indicates which PCS has leakage problem (see "Identify the type of leakage with Power Conversion Station (PCS) LEDs behavior" on page 471). Replace the reported PCS with a new one. See **https://pubs.lenovo.com/n1380/dwc_pcs_cage_replacement**.
4. Use the absorbent cloth to dry the wet components or inside of the tray whenever necessary.

   Note: It is important to visually inspect the bottom of the enclosure with a flashlight prior to re-installing the components into the enclosure.
5. Connect the power cords to all the enclosure PCS, and power on the enclosure. See https://pubs.lenovo.com/n1380/hardware_replacement_procedures.
6. If you are unable to identify the problem in the steps above, then you may need to contact Product Engineer for the further assistance.

Disconnecting power cords from all Power Conversion Stations (PCS)

Before removing components to inspect leakage, it is important to disconnect power cords from all enclosure Power Conversion Stations. Disconnecting power cords for at least two minutes is crucial to avoid PCS latching.

Follow the steps below to disconnect power cords from PCS.

1. ① Rotate the power socket latches outwards.
2. ② Disconnect the power cable from the PCS.

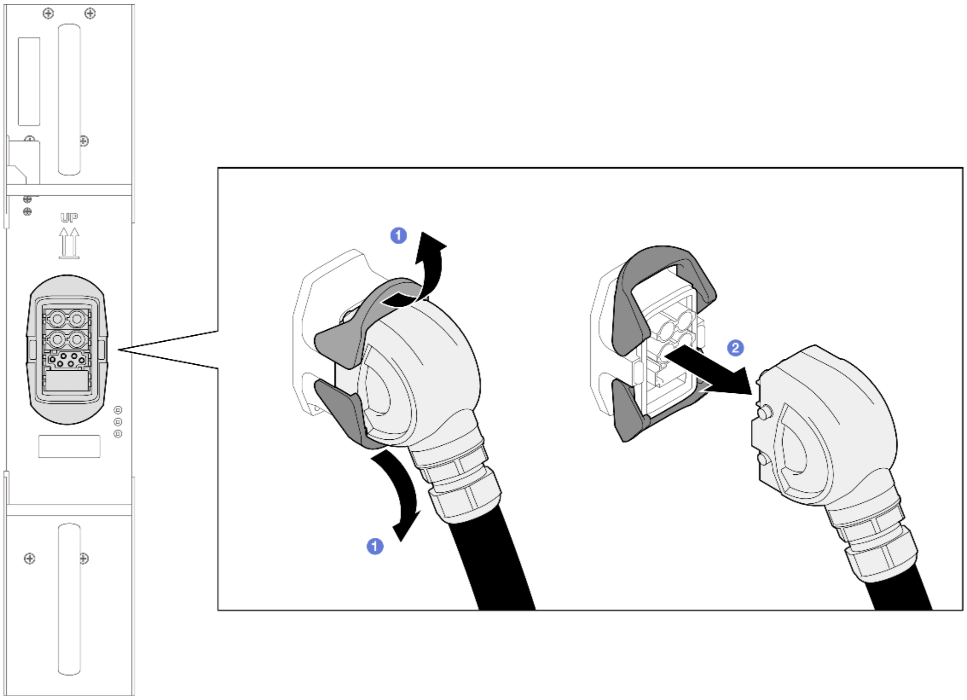


Figure 516. Disconnecting the power cord from PCS

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

On the World Wide Web, up-to-date information about Lenovo systems, optional devices, services, and support are available at:

http://datacentersupport.lenovo.com

Note: IBM is Lenovo's preferred service provider for ThinkSystem.

Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

Attempt to resolve the problem yourself

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The online help also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for your ThinkSystem products at the following location:

https://pubs.lenovo.com/

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. (See the following links) The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
  - Drivers and software downloads
    - https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/
  - Operating system support center
    - https://datacentersupport.lenovo.com/solutions/server-os
  - Operating system installing instructions
    - https://pubs.lenovo.com/thinksystem#os-installation
- If you have installed new hardware or software in your environment, check https://serverproven.lenovo.com to make sure that the hardware and software are supported by your product.
- Refer to Chapter 7 “Problem determination” on page 437 for instructions on isolating and solving issues.

- Go to http://datacentersupport.lenovo.com and check for information to help you solve the problem.

  To find the Tech Tips available for your server:

  1. Go to http://datacentersupport.lenovo.com and navigate to the support page for your server.
  2. Click on **How To's** from the navigation pane.
  3. Click **Article Type** → **Solution** from the drop-down menu.

     Follow the on-screen instructions to choose the category for the problem that you are having.

- Check Lenovo Data Center Forum at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

Gathering information needed to call Support

If you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare the appropriate information before you call. You can also go to http://datacentersupport.lenovo.com/warrantylookup for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier). Machine type number can be found on the ID label, see "Identify the solution and access the Lenovo XClarity Controller" on page 27.
- Model number
- Serial number

  Attention: For SC750 V4, if the serial number is acquired via XCC, LXPM, or Confluent, remove the "A" or "B" from the end of the serial number when requesting information from http://datacentersupport.lenovo.com/warrantylookup. For example, if the serial number is ABCDEFGHA, input ABCDEFGH to request warranty information.

- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to https://support.lenovo.com/servicerequest to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

Collecting service data

To clearly identify the root cause of a server issue or at the request of Lenovo Support, you might need collect service data that can be used for further analysis. Service data includes information such as event logs and hardware inventory.

Service data can be collected through the following tools:

- **Lenovo XClarity Provisioning Manager**

  Use the Collect Service Data function of Lenovo XClarity Provisioning Manager to collect system service data. You can collect existing system log data or run a new diagnostic to collect new data.

- **Lenovo XClarity Controller**

You can use the Lenovo XClarity Controller web interface or the CLI to collect service data for the server. The file can be saved and sent to Lenovo Support.

  - For more information about using the web interface to collect service data, see the “Backing up the BMC configuration” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.
  - For more information about using the CLI to collect service data, see the “XCC `servicelog` command” section in the XCC documentation compatible with your server at https://pubs.lenovo.com/lxcc-overview/.

- **Lenovo XClarity Administrator**

  Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support.

  You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at https://pubs.lenovo.com/lxca/admin_setupcallhome.

- **Lenovo XClarity Essentials OneCLI**

  Lenovo XClarity Essentials OneCLI has inventory application to collect service data. It can run both in-band and out-of-band. When running in-band within the host operating system on the server, OneCLI can collect information about the operating system, such as the operating system event log, in addition to the hardware service data.

  To obtain service data, you can run the `getinfor` command. For more information about running the `getinfor`, see https://pubs.lenovo.com/lxce-onecli/onecli_r_getinfor_command.

Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to https://datacentersupport.lenovo.com/serviceprovider and use filter searching for different countries. For Lenovo support telephone numbers, see https://datacentersupport.lenovo.com/supportphonelist for your region support details.

Appendix B. Documents and supports

This section provides handy documents, driver and firmware downloads, and support resources.

Documents download

This section provides introduction and download link for handy documents.

Documents

Download the following product documentations at:

https://pub.lenovo.com/sc750-v4/pdf_files

- ***Rail Installation Guide for 13U Enclosure***
  - Rail installation in a rack
- ***SC750 V4 Neptune DWC Tray User Guide***

  Complete overview, system configuration, hardware components replacing, and troubleshooting.
- ***SC750 V4 Messages and Codes Reference***

  XClarity Controller, LXPM, and uEFI events
- ***UEFI Manual***
  - UEFI setting introduction

Notes: SC750 V4 tray can be installed in the N1380 13U enclosure, which can be installed in the ThinkSystem Heavy Duty Full Depth Rack Cabinets. The documentations below are available for download:

- *N1380 Enclosure User Guide*
- *ThinkSystem Heavy Duty Full Depth Rack Cabinets User Guide*

Support websites

This section provides driver and firmware downloads and support resources.

- Drivers and Software download website
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj/downloads/driver-list/
- https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg
- Lenovo Data Center Support
  - https://datacentersupport.lenovo.com/products/servers/thinksystem/sc750v4/7ddj
- https://datacentersupport.lenovo.com/documents/lnvo-eula
- https://lenovopress.lenovo.com/ (Product Guides/Datasheets/White papers)
- https://www.lenovo.com/privacy
- https://datacentersupport.lenovo.com/product_security/home
- http://datacentersupport.lenovo.com/warrantylookup
- https://datacentersupport.lenovo.com/solutions/server-os
- https://serverproven.lenovo.com (Options compatibility lookup)
- https://pubs.lenovo.com/thinksystem#os-installation

- https://support.lenovo.com/servicerequest (Service request)
- https://datacentersupport.lenovo.com/solutions/ht509500 (Stay up to date on firmware updates)

Appendix C. Notices

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Important notes

Processor speed indicates the internal clock speed of the processor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard-disk-drive bays with the largest currently supported drives that are available from Lenovo.

Maximum memory might require replacement of the standard memory with an optional memory module.

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as `total bytes written` (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. Lenovo is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

Lenovo makes no representations or warranties with respect to non-Lenovo products. Support (if any) for the non-Lenovo products is provided by the third party, not Lenovo.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Additional electronic emissions notices are available at:

https://pubs.lenovo.com/important_notices/

Taiwan region BSMI RoHS declaration

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機架	○	○	○	○	○	○
外部蓋板	○	○	○	○	○	○
機械組合件	–	○	○	○	○	○
空氣傳動設備	–	○	○	○	○	○
冷卻組合件	–	○	○	○	○	○
內存模組	–	○	○	○	○	○
處理器模組	–	○	○	○	○	○
電纜組合件	–	○	○	○	○	○
儲備設備	–	○	○	○	○	○
印刷電路板	–	○	○	○	○	○

備考1.〝超出0.1 wt %〞及〝超出0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。

Note1 : “exceeding 0.1wt%” and “exceeding 0.01 wt%” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2.〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

Note2 : “○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3.〝 - 〞係指該項限用物質為排除項目。

Note3 : The “-“ indicates that the restricted substance corresponds to the exemption.

Taiwan Region import and export contact information

Contacts are available for Taiwan Region import and export information.

委製商/進口商名稱: 台灣聯想環球科技股份有限公司
進口商地址: 台北市南港區三重路 66 號 8 樓
進口商電話: 0800-000-702

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